CHAPTER 4

THE FORTIFICATIONS

Robin Coningham and Paul Cheetham

4.1 Introduction

The fortifications or defences of the Citadel were first identified on the southern side as a banked earthwork by Parker in the early twentieth century (Parker 1909: 274), and by 1924 the entire circumference was included in a map of Anuradhapura published by the Archaeological Survey Department (Hocart 1924) (Fig. 31). They were excavated for the first time in 1960 by Godakumbura, who cut a section through the southern rampart (Godakumbura 1961). He hypothesized that they had consisted of a moat and a brick and earth rampart capped with an ashlar wall. Godakumbura's successor, Silva, continued this work by excavating part of the eastern rampart in the 1970s. Although the report is still pending, it appears that he uncovered a brick wall 5 m high. In 1992 the fortifications were further excavated by a team of Japanese and Sri Lankan archaeologists, who may have identified a defensive sequence of over 1500 years (Coningham 1993; Ueyama and Nosaki 1993). These studies suggest that Anuradhapura, like many other early historic cities, had a defensive complex consisting of a moat and a rampart capped by a wall.

In 1993 and 1994 the British sub-project working within the Anuradhapura Citadel Archaeological Project (ACAP) decided to study the course and fabric of the Citadel's fortifications. Our survey strategy had two aims: firstly, to identify the wall and moat; and, secondly, to evaluate the possible advantages of using archaeological geophysical field techniques in Sri Lanka. The reasons for these aims were threefold. Firstly, we wanted to test the feasibility of using a proton magnetometer in Sri Lanka. As we were aware that a single-sensor proton magnetometer would be unsuitable for detailed work owing to a combination of factors, a gradiometer arrangement normally being more appropriate for small-scale anomalies as well as reducing interference effects such as diurnal variations in the earth's magnetic field (Milsom 1989: 45; Clark 1990: 66; Scollar *et al.* 1990: 455), we decided that for the 1993 field season we would attempt to record a feature which should be identifiable as a clear anomaly - the moat. Our survey sectors were therefore selected to cross the postulated line of the fortifications at right angles to allow its identification. Secondly, following our involvement in the interpretation of the excavation section across the southern rampart in 1992, we intended to identify the course of the wall around the entire site in order to draw attention to its course for preservation and protection from either housing development or use as a quarry for building materials, as is currently the case for the southern rampart. Thirdly, we wanted to plan the course of the wall in order to estimate the extent of the area it enclosed.

This chapter is divided into five sections. The first covers previous investigations of the Citadel's fortifications, the second describes the various techniques and methods used to investigate their course, and the third and fourth describe the investigations on the north, south, east and west sectors of the site. The fifth and final section introduces evidence for dating the defensive complex of the Citadel.

4.2 Previous investigations of the Citadel's defences

Although textual descriptions of the city had been available from 1837, following the publication of the translation by George Turnour (1779–1843) of the Pali text of the *Mahavamsa*, the secular urban core of the monastic complex of Anuradhapura - the Citadel - was not successfully identified until the early twentieth century, when Parker traced the southern wall through a combination of surface observations and the *Mahavamsa*'s historical topography (Parker 1909: 274). Surprisingly, it was not until 1960 that the identified rampart was first investigated, despite the fact that it had been surveyed and incorporated into one of the first detailed Archaeological Survey Department's plans of the area (Hocart 1924). The then Archaeological Commissioner, Dr Godakumbura, initiated an excavation on recently acquired land which incorporated one of the southern gateways and part of the southern rampart. One north–south trench was cut between the Godage private road, which runs parallel to the rampart within the walls, and the irrigation channel to the south of the rampart (Godakumbura 1961). The 5.66 m deep trench located two parallel lines of ashlar blocks some 3.5 m apart, packed with filled earth and occasional stone slabs. Godakumbura proposed that the modern irrigation channel running parallel to the rampart probably followed the line of the old moat. He also appears to have assumed that the rampart was a single-phase construction and suggested that the parallel lines of ashlar slabs lay at the centre to give the construction strength while the base was probably of brick. A larger east–west trench was cut in order to expose a portion of gate and a 17 m wide street passing through it at right angles to the rampart. At the centre of the gate a brick structure measuring 8 x 5.33 m was identified and has been interpreted as a check-post. The excavation was never fully completed or published, and no attempt was made to date, phase, record or conserve the structures uncovered. The unprovenanced finds stress the mixed nature of the deposit and include sherds of Rouletted ware, Sassanian–Islamic blue glazed ware and early Islamic white glazed ware or early South Chinese white glazed ware (ibid.). A large section on the eastern side of the Citadel was excavated by Godakumbura's successor, Dr R.H. de Silva, in the 1970s. Although the structures exposed were conserved, the excavation report is still pending; however preliminary results suggest a wall some 5 m thick and 5 m high with a 2.5 m parapet on the inside (Pl. IVb). The foundations were dated to the second century BC. In 1992 the southern fortifications were further investigated by another ACAP sub-project, directed by a team from the Japanese Overseas Co-operation Volunteers (JOCV) (Coningham 1993; Ueyama and Nosaki 1993). This team selected for excavation a very well preserved section of wall which we had surveyed in 1991 and 1992, close to the Sanghamitta Road which cuts north–south through the Citadel. In addition to clearing a stretch of 20 m along both sides of the wall, later conserved for public presentation, they excavated three sondages, pit A, pit B and pit C, down to bedrock (Ueyama and Nosaki 1993). Although no samples were selected for chronometric dating, the excavators suggested a date from the late Anuradhapura period for the final phase of the fortifications (ibid.: 99). The results of this excavation are re-examined in more depth in section 4.8 below.

Having thus summarized the history of archaeological investigation of the Citadel's fortifications, we may now detail the results of our own two field seasons of work on them.

4.3 Methods and techniques

As part of the contour survey of the Citadel, members of the Archaeological Survey Department and British–Sri Lankan Anuradhapura Project carried out a detailed clearing operation and survey of the Citadel from 1989 onwards. Part of their brief was to trace and plan the extent of the site itself. During this work it became clear that information concerning the nature and orientation of the city's ancient fortifications needed to be recorded. One of the clearest alignments noted was a parallel line of ashlar blocks running eastwards from the Sanghamitta Mawatha bridge across the old southern moat to the southeast of the Godage Walawwa and the location recorded as a prospective excavation site. This site was later excavated by a Japanese sub-project in 1992 (Coningham 1993; Ueyama and Nosaki 1993). It was then decided to investigate the defensive circuit by the use of four methods: surface survey, magnetic survey, resistance survey and a coring survey. In particular we wished to assess the possible contribution of archaeological geophysics to the archaeology of South Asia through a pilot study at Anuradhapura. These techniques, which are virtually non-destructive, now play an integral role in archaeological site assessment in Europe. They are generally used in two main applications: firstly, the assessment of newly discovered archaeological sites and, secondly, the comprehensive survey of a known site. While the former usually aims at defining the extent of the sub-surface remains, the latter can be used as a base for the creation of a site management strategy to assist with any future development at the site. These techniques have a further advantage over test excavations or sondages: they are highly cost- and time-efficient, so a small team can survey sites quickly. Many of these points have been fully illustrated by two UNESCO pilot missions to South Asia led by Coningham in 1997. These missions, one to Bangladesh and one to Nepal, attest to the effectiveness of this instrumentation in detecting sub-surface monuments within the context of archaeological sites (Coningham and Schmidt 1997a, 1997b).

4.3.1 Surface survey

At each sector we constructed a grid using the concrete posts which had been erected at 30 m intervals across the entire archaeological site. As all our sectors were located in dense scrub they had to be cleared, and while doing this we uncovered a number of ashlar blocks and scatters of brickbats. The surface survey teams planned the visible ashlar and brick debris and alignments and conducted a detailed contouring survey with a theodolite every 2.5 m within the respective sectors. In a number of sectors, the north, south and west in particular, the final phase of the Citadel's fortifications – an ashlar wall – were clearly visible. This surface observation later proved to be very useful when attempting to interpret the archaeological geophysical results.

4.3.2 Proton magnetometer survey

We constructed a grid at each sector using the concrete posts which had been erected at 30 m intervals across the entire archaeological site. After the sectors had been cleared of dense scrub, we conducted a geophysical survey with a proton magnetometer. The survey was conducted with the single-sensor Geometrics Portable Proton Magnetometer, model G816. The model selected had the advantages of providing rapid, accurate measurements (one reading every six seconds) while being a rugged and compact field instrument. It was powered by twelve 1.5 volt batteries and weighed some 4.3 kg. The data from the six survey traverses that made up each of the transects were analysed using Spyglass Transform for Windows. The six traverse readings were taken across the transect as the survey progressed along the transect length. As a single-sensor instrument was used, any anomalies of archaeological origin would be superimposed upon the diurnal variation, this variation being evident as the general rise and fall in the profile along the transect. In each case the transect's magnetic profile, magnetic contouring, magnetic dot density image (higher readings showing as darker areas) and topographical profile have been illustrated.

4.3.3 Earth resistivity survey

We returned to the Citadel in 1994 in order to further clarify the investigations with an earth resistivity survey. The electrical resistivity of the earth largely depends on its moisture content, which varies between differing sub-soil features. Such sub-soil features, whether human or natural, may appear as anomalies if their moisture content differs significantly from that of adjacent features (Clark 1990: 27). It is possible to detect such anomalies by measuring the varying resistance to the passing of an electric current through the soil between two probes. Although this is an over-simplification, the design of all resistivity meters is based on this model. In practical field instruments four probes are employed: two to pass the current through the ground and two to measure the resistance. Frequently, but not under all conditions, features such as moist ditch fills will register lower resistance readings, while others, such as sub-soil walls, will register higher resistance readings, when compared to the mean background level of resistance. The method is affected by climatic and geological conditions, which can significantly enhance or mask traces of human activities (ibid.: 53). Because of increased numbers in the 1994 field teams we were able to concentrate on area surveys rather than linear ones. The area survey is now the norm for resistance survey as it allows identification of possible man-made features with a greater degree of certainty. The equipment used was the Geoscan Research Resistance Meter RM4, which is designed to be a swift, robust and accurate field instrument. The battery had a life of 22 hours and took 14 hours to recharge. For an archaeological survey it is normally used in the 0.5 m twin probe configuration. This configuration provides simple response profiles, has good depth penetration, is not affected by probe orientation and is efficient in use (only two probes fixed on a rigid frame are moved between readings). The spatial resolution of the surveys was 1 x 1 m, giving 400 readings per 20 x 20 m surveying grid. The data was hand-logged on prepared survey sheets and the readings were analysed in the field with Geoplot software. Contors software, written by J.G.B. Haigh (University of Bradford), was employed for more detailed analysis and the creation of the resistivity survey images. Further data analysis and the creation of the profiles was done using software written by P.N. Cheetham (University of Bradford). Micrografx Windows Draw 3.0 was used to create the final publication figures.

4.3.4 Soil auger coring survey

Soil auger coring has long been practised in the Netherlands for building up compilation maps of soil types (Steur 1961). Attempts have even been made at conducting close-interval coring of archaeological sites in order to predict detailed internal site structure (Hoffman 1993). However, the best results are obtained when dealing with sites at a macro-level (van Andel and Runnels 1995).

In 1994 we also wished to test the interpretations of the geophysical and surface surveys with a soil auger. Using a collapsible, 10 m long Eijkelkamp soil auger for heterogeneous soils, kindly lent by the McDonald Institute for Archaeological Research (Cambridge University), we took cores to bedrock along transects at right angles through the defences and out into the surrounding fields. Each 0.2 m soil core was recorded for Munsell colour, texture and inclusions. Using the results of these cores we were able to reconstruct the stratigraphy from these samples and draw a section allowing us to confirm or refute the presence of the defensive ditch. Drawbacks of this method include the inability of heads to grind through stone, although potential damage to a site or objects is statistically minimal. It is a rapid and cheap method of sub-surface investigation. We found that we could complete a 10 m deep core in about 4.5 hours. We also successfully conducted a complete core profile across the Citadel mound (Fig. 32). These cores, taken at 150 m intervals, allowed us to build up a projected macro-stratigraphic profile for the entire site as well as confirming that the earliest occupation at the site was on a slight rise of alluvial gravels and bedrock.

We have since conducted a similar survey at the Bala Hisar of Charsadda during our collaborative fieldwork with the University of Peshawar and again found very positive results (Ali *et al.* 1998).

4.4 The northern fortifications

The northern edge of the Citadel mound was surveyed in both 1993 and 1994. The 1993 survey area measured 100 m north–south and 30 m east–west (Fig. 33). The profile of the northern edge of the Citadel mound is similar to that of the western edge. The crest of the rampart stands some 5 m above the surrounding paddy fields. The paddy begins at between 71 and 78 m from the beginning of the transect and gradually rises in gradient at 100 m. Once the bush had been cleared it became evident that there were numerous scatters of ashlar blocks on the slope of the rampart. In addition, it appeared that part of the ashlar wall identified at the southern and western edges of the mound was also preserved *in situ* at the northern edge (Fig. 34). A number of slabs orientated east–west formed an alignment 15 m long. This alignment crossed both transects at between 20 m and 25 m from the beginning of the transect. Two transects, each 100 m long and 5 m wide (six traverses spaced 1 m apart), were surveyed using the proton magnetometer. Transect 3 indicates a high degree of magnetic variation along its length both within the Citadel and down the slope onto the paddy (Coningham 1992). A significant band of negative values across all six traverses is noted at 40 m, which could indicate the line of a stone feature. Transect 4 is magnetically less active although still exhibiting some anomalous variations at around 40 m. Both transects peak at around 50–60 m with evidence of larger-scale variations within this band, and both then drop down towards the 80 m point before rising again. These profiles suggest that this may represent changes in sub-surface deposits and not simply a diurnal variation effect.

In 1994 we conducted a resistivity area survey covering 4200 square metres. As expected, the Citadel mound itself gave readings of highest resistance (measuring up to 37 ohms), probably the result of a combination of the dry-season climate and the fact that the man-made tell site stands some 4 m above the surrounding paddy fields. This area of highest resistance does show some evidence of rectilinear edges to anomalies that may represent structural features (Fig. 35). The ashlar slab alignment identified in the 1993 surface survey failed to register on the resistivity survey. Similarly, the only feature within the paddy fields was a higher resistance along the paddy bunds on either side of the small stream in the northeast corner of the survey area 'C'.

During the 1994 season we also took six auger cores along a 150 m transect running at right angles across the defences and out into the paddy fields (Fig. 36). During the magnetometry and resistivity surveys we had failed to differentiate any clear anomalies outside the rampart, although the magnetometry survey showed some anomalous responses. The auger coring, however, allowed us to identify a feature, probably connected with the Citadel's fortifications. We first plotted the profile of the surface and then the depth and contouring of the bedrock below, as indicated from the cores. It was clear that the bedrock was 1-2 m higher to the south, that is within the Citadel, as opposed to that underlying the paddy fields. It was also clear that the bedrock had been cut to a maximum depth of 2 m by a feature at a distance of between 45 and 90 m along our transect 'D'. This feature had in turn been cut by a feature filled by a silt rich in snail shells, 'E'. The latter feature was 80 m wide and some 3 m deep. It seems possible that the rock-cut ditch is part of the original fortifications, while the shell-filled ditch is a later intrusive phase of fortification.

4.5 The eastern fortifications

In 1993 we surveyed a block 30 m wide and 65 m long with an additional 10 x 10 m block at its extreme southeast corner (Fig. 37). The eastern sector represented both the easiest and the most difficult area to work in. Although we were able to clear collapsed material and bush from an old excavation trench and expose a 4 m high brickbat wall running north–south, the gradient recorded by the contour survey showed a very gradual profile (Fig. 38). It also appears that the road on the eastern edge of Sector C had been built over part of the rampart. On clearance we found few ashlar blocks, and none *in situ*. As we were also unclear as to the course of the rampart at the southeast of the Citadel we conducted a surface survey of a further area to the east of the main block of C. When this fresh area, measuring 90 m north–south and 30 m east–west, was cleared, we found a low bank with a north–south alignment of blocks which have been interpreted as marking the course of the wall. Three magnetometer transects were taken over the sector; only Transect 6 is described (Coningham 1992). Transect 6 (k–l), measuring 65 x 5 m (six traverses spaced 1 m apart), was located 5 m to the north of Transect 5. The readings show relatively small variations from 0 to 30 m, with a negative dip at around 18 m that could indicate a buried stonework feature. Between 30 m and 57 m stronger, larger-scale variations are apparent in the profile. A steeper drop in background levels beyond 57 m is more than may be expected to result from diurnal variations and so may represent a general change in the sub-surface deposits.

In 1994 we investigated the eastern sector using an area resistivity survey covering 2100 square metres. The area survey, together with a resistance profile along the line of the auger transect (see below), is reproduced in Figure 39. This, one of our most successful surveys, indicated significant, substantial sub-soil features. The most obvious feature was the 30 m long high-resistance linear anomaly, aligned north–south, between 20 and 30 m east of the sector's western edge (marked 'A - A'). This anomaly, notwithstanding what is interpreted as a large robber pit (low-resistance anomaly 'A1', which lies on the line of the resistance profile), correlates with a number of ashlar slabs lying on the surface and most probably indicates the course of the wall. It is possible that a parallel north–south concentration of high resistance some 4–5 m further west may present another line of ashlar and brick. Such a wall would be very similar to the exposed portion visible at the southern sector. From this point to the western edge of the survey some structure is evident in and between a number of high-resistance anomalies that may represent building remains. Two of these anomalies are crossed by the resistance profile. It is very possible that low-resistance anomalies 'D' represent the silt-filled craters of robber pits or areas free from substantial building debris; anomaly 'D1' is substantially lower in resistance than the surrounding areas. An almost 20 m wide north–south alignment of low resistance, noted as feature 'C - C' on the figure, is interpreted as a possible moat or ditch, its edges being well defined on the resistance profile. To the southern edge of the survey area this anomaly is less well delineated, but analysis of the resistance readings in this area suggests that fans of higher-resistance material may have been dumped or slumped into the ditch at this point both from the west and south. A further area of lower resistance (markedly uniform), 'B - B', was identified at the easternmost edge of the sector, separated from 'C - C' by a 7 m wide, north–south aligned band of comparatively higher resistance, 'E - E', that also shows up well on the profile. It is significant to note that the feature A'-A', the fortification wall, runs due north–south across the survey grid, indicating that the line of the defences follows the 75 m contour at this point. This categorically refutes, for the first time, the postulated line of the eastern fortifications as indicated by Hocart, who suggested that the fortifications followed the 81 m contour, thus giving the Citadel a pentagonal shape (Hocart 1924). It now seems more likely that the Citadel was originally laid out as a rough square, but that the southeast corner has been badly damaged by erosion and agriculture. Only further detailed survey in this area is likely to confirm the exact course of the fortifications.

The eastern sector was subjected to an auger coring transect measuring 140 m. A total of ten cores were taken along this length and the stratigraphic profile was plotted (Fig.40). The resultant profile identified three very clear features which related to the results of both geophysical surveys. We first identified a 2 m deep and 70 m wide cut into the bedrock under the present edge of the Citadel mound 'M'. It is assumed that this represents an old moat or ditch, and it was identified as low-resistance anomaly 'C - C' on the resistivity survey and as a more active portion of the magnetometry profile. This feature was then in turn cut by a new ditch or moat, 'N', measuring some 65 m wide and 3 m deep. This second feature was filled with silts and snail shells, suggesting the presence of slow-moving or still water. This feature is clearly the low-resistance anomaly 'B - B' and is possibly represented by the magnetic response change beyond 57 m. That the two features were not contemporary is confirmed by the absence of shells in the inner, older moat and the clear shell horizon fill overlapping the inner moat. Anomaly 'E - E', a band of high resistance, was identified during the auger coring as a residual stump of bedrock isolated between the two moat cuts. It is clear that these two cut features are very similar to the double cut feature identified in the northern transect. It seems probable that the shell-filled features are later fortifications replacing the earlier, presumably silted moats.

4.6 The southern fortifications

A brief surface survey of the southern edge had been made in 1991 by members of the Archaeological Survey Department and British sub-project and had been followed up by excavations in 1992 by members of the Archaeological Survey Department and Japanese Overseas Co-operation Volunteers (Coningham 1993; Ueyama and Nosaki 1993). However, this area was not suitable for us to examine in 1993 since the wire fencing or power lines that run along the entire length would have distorted the proton magnetometer survey. In 1994, however, we were able to examine this area during the resistivity and soil coring surveys (Fig. 41). The southern sector represented our largest area survey covering some 7400 square metres, running from the edge of the Citadel mound down to the Thuparama and Sanghamitta stupa complex to its south (Fig. 42). The results were remarkably successful, but only in combination with the results of the auger coring survey. Our survey sector was disturbed by a number of modern features, the irrigation ditch, the road, the foundations of buildings close to the cross-roads 'O', and grit thrown up from the excavation of the ditch 'P'. Other archaeological features included the southern extent of the rampart and fortifications 'Q' and a 30 m wide, east–west anomaly of high resistance, 'R', running the entire length of the survey area. This feature masks, or partially masks, areas of low residence 'S' – areas which we know are linked from the auger coring survey. One such area appears to have been delineated by lines of high resistance, probably walls 'T - T'.

Many of the high- or low-resistance anomalies identified during the resistivity survey were confirmed as archaeological features during the auger survey (Fig. 43). We took over a total of 18 cores along a length of 130 m from within the Citadel mound to the Thuparama complex. Initially we took one core every 2 m; however in certain localities along the north–south transect we cored more intensely. The base of the moat feature, for example, was sampled by no fewer than eight cores. While constructing the overall transect section we plotted only selected macro-features. Initially we plotted the ground surface and then the surface of the bedrock. It became clear that the surface of the bedrock sloped from north to south. The bedrock under the Citadel's rampart was some 2 m higher than that close to the Thuparama. It was also clear that there was no gentle gradient between the two ends of the transect; rather a large, scooped 'U' measuring 60 m wide and 3 m deep had been cut into the bedrock. This feature corresponds with the low-resistance anomaly 'S' identified during the resistivity survey. The bottom 1 m of this feature was filled with silts and snail shells – suggesting the presence of slow-moving water. This feature is clearly a silted moat. Owing to the paucity of finds from the cores, we are unclear as to the age of the cutting of the structure, however we are more clear about its abandonment. Feature 'R' was identified as a 6 m wide and 1 m deep deposit of grit and brickbat fragments running east–west across the transect. The surface survey identified numerous ashlar pillars and blocks within the feature. The similarity between this feature and others dating to the later phases of occupation within the Citadel, in particular a pillared alignment parallel to the Vijayabahu palace site, suggests a late Anuradhapura-period date for this feature. As it is clear from the coring that feature 'S' seals the silted moat or ditch below it, this suggests that by the late Anuradhapura period maintenance and use of the southern ditch or moat had already lapsed. It is interesting to note that the moat fill is rich in snail shells. Such a feature makes it tempting to link it with the shell-filled moat features at the northern and eastern sectors. It may be postulated that the fortifications were not relocated on the southern side of the Citadel because of the closeness of the religious structures to its south. In such a case it may be that the southern moat or ditch was just re-cut on the same alignment (Fig. 44).

4.7 The western fortifications

The area surveyed on the western edge of the Citadel in 1993 measured 107 x 30 m (Fig. 45). This area is one of the clearest, with the rampart rising almost 7 m above the paddy. The rampart stops at the edge of the paddy, which is some 54 m wide (Fig. 46). At the extreme western side of the paddy, 127 m from the eastern edge of the transect, the land rises slightly to the road. During 1991 this area had been selected for possible investigation as there were a number of ashlar blocks on the 82 m contour line at the top of the rampart mound. This alignment runs for some 180 m on a north–south alignment. On clearing the area for survey it became clear that the alignment consisted of two lines of parallel ashlar blocks spaced some 4 m apart. The alignment crosses the first transect between 25 m and 35 m from the beginning of the transect. It is very probable that this represents a continuation of the wall identified in the sixth phase of the southern rampart excavation (Coningham 1993: 114). Although surveyed with the proton magnetometer in 1992 (Coningham 1992), the area was flooded for paddy in 1994, causing us to concentrate our resistivity and auger coring surveys on the northern, eastern and southern sectors.

Two transects were recorded in 1993 using the proton magnetometer, the first 107 m long and 5 m wide, the second 124 m long and 5 m wide, the latter also including a stretch of 20 m east into the Citadel proper. As with Sectors B and C, each transect was 5 m wide, and thus for each metre through the defences at right angles we recorded six readings.

Transect 1 (a–b) was begun on the Citadel. Between 5 m and 15 m the magnetometer registered an acute positive anomaly larger than 160 gamma. This anomaly has been marked 'V'. As this anomaly occurred on the line of a wire fence that we had removed from a line of bushes, it is hypothesized that it represents nails or rusted metal fragments left behind. After this anomaly the readings display only minor variations until we reached a point at 50 m along the transect. Between 55 m and 65 m there are stronger variations with indications of a large positive anomaly. Both sides of this anomaly have been marked 'W'. The readings then exhibit only minor variations until 80 m is reached, when the variations become more marked. At 100 m we reached a house compound and the electrical disturbance produced a further acute magnetic anomaly which has been marked 'X'.

Transect 2 (b–c) was not as revealing as Transect 1. It measured 124 m by 5 m and started 20 m further into the Citadel than Transect 1. Between 0 and 20 m we recorded a strongly variable set of readings. Between 20 m and 35 m we recorded an acute positive anomaly with a negative spike at its centre. This anomaly has been marked 'Y'. As with Transect 1 this is likely to be metal from the fence line running along the top of the rampart. The readings then show variation increasing up to 110 m. At 120 m a house compound was reached and a further positive anomaly was recorded. It is likely that the paddy fields at the foot of the rampart actually represent a silted portion of the original city moat, however only an auger profile will confirm this hypothesis.

4.8 Dating the fortifications

Following the findings of the surface survey, part of the southern rampart was identified as being well-preserved and suitable for an excavation to recover evidence of the dating and phasing of the fortification complex at Anuradhapura. Thus an ACAP team, in collaboration with a Japanese group, began excavation in 1992 with the aim of producing a datable sequence of construction for the Citadel's defences and to conserve and clear a length of rampart for presentation to the public (Coningham 1993; Ueyama and Nosaki 1993). The coordinates of the deep sounding trenches, Anuradhapura Citadel Rampart South (ACRS) 5A, 4A and 4B, were 17N/16E. The dimensions of the three cardinally oriented trenches were 3 m long, 3 m wide and 8.1 m deep. ACRS 5A was located on the north edge of an observable parallel line of ashlar slabs, ACRS 4A was located on the southern edge of the slabs 3.5 m due south, with ACRS 4B a further 3 m due south. The coordinates of the presentation trench were 17N/16E. Its dimensions were 24.5 m long, 15.5 m wide and 2 m deep. The trench ran along the line of the wall from the eastern side of the Sanghamitta Mawatha, or road, at the latter's bridge across the old southern moat to the east. As this excavation represents the first published report of a section through the ramparts of the Citadel, it will be examined in detail in this section since it offers an opportunity to date the successive phases of fortifications at the site. This section has been augmented with data recovered by an auger survey conducted at the site by our team in 1994 (Fig. 47).

The individual contexts identified in the three excavation pits may be grouped to form a continuum of eight macro-contexts. They are, in order of age: Reddish Brown Earth, a mixture of Reddish Brown Earth and bedrock, a mixture of clay and sand lenses, an ashy-silt deposit, a decayed brickbat deposit, a further ashy-silt deposit, a gritty deposit and a topsoil humus. These eight macro-contexts are known to form the complete depositional sequence throughout the Citadel mound, and thus we are able to correlate the phases of rampart construction with a particular phased development sequence. During analysis of the data and sections it became clear that the three trenches, originally orientated to excavate the rampart near the latest ashlar phase, had only located the inner toe of the earliest rampart phases. The rampart centre had moved some 10 m north over time, so the description of the earliest phases of its construction is incomplete. The earliest phase occurs only in pit ACRS 4B, where the inner toe of a mound of compacted Reddish Brown Earth was encountered. The visible dimensions were at least 2 m wide and 2.10 m high, with redeposited rocks of bedrock at the highest point. This core was then overlaid by a further deposit of compacted Reddish Brown Earth mixed with flecks of bedrock. This second phase extended into pit ACRS 4A and the visible dimensions of the rampart became at least 7.34 m wide and 2.45 m high. The third phase appears to be a depositional or erosion feature rather than a construction feature. The clay and sand deposit appears to be a mixed wash from the erosion of the rampart which has collected at the inner toe. The deposit is 0.97 m at its thickest and appears to integrate with occupational sequences of the same deposit to its north. The fourth phase consisted of a layer of ashy silt, overlying the second phase mound and the third phase wash. The deposit was 1 m thick and thus increased the visible dimensions of the rampart to at least 3.30 m high and 9 m wide. The inner toe of the rampart joined occupational deposits of the same macro-context to its north. Phase five saw an additional 1.10 m height added to the rampart, making the total height at least 4.40 m. The deposit consisted of brickbats and decomposed brickbat material. The sixth phase levelled and spread the remains of the brick-built rampart and added an additional 3.5 m thick deposit of ashy silt.

The enlarged rampart, now 7.9 m high, had a wall constructed at the new centre, some 10 m north of the phase one mound. The wall's foundation consisted of an ashy-silt core, containing occasional ashlar slabs, faced with two parallel lines of ashlar slabs. The foundations were 3.6 m wide and were preserved to a height of eight slabs (1.4 m high). The presentation trench cleared a length of 24.5 m of ashlar and brick walling. The Citadel's southern gateway was identified at the westernmost point of the trench flanking the eastern side of the modern Sanghamitta Mawatha. The gatehouse, built of brickbats on an ashlar foundation, was located centrally across the rampart and was 9.06 m long. It was not possible to locate the eastern side of the gate because of the metalled nature of the road and a row of houses on its western edge. It appears to have been divided by two outer walls and two inner walls into three cells: the southern cell was 2.73 m long, the central cell 3.6 m and the northern cell 2.73 m long. The position of one of the gates was identified from an *in situ* ashlar slab with a worn socket. The wall appears to have collapsed and had been partially robbed for building materials. Two badly damaged stone bulls were found in the debris of the wall. A seventh and final construction phase added a layer of grit to the rampart, completely covering the earlier ashlar and brickbat wall. The grit layer was between 1.30 m and 0.20 m thick and gave the rampart a height of 8.1 m. A short central alignment of ashlar slabs was found near the surface, perhaps marking the final defensive wall of the Citadel.

It became clear that the sequence of macro-contexts from the ACRS pits can be correlated with the sequence from many of the Citadel sondages. This correlation may be used to help us date the various phases of rampart construction from the carbon dates and artefacts already recovered from the earlier excavations.

The primary phase of rampart construction was a mound built of compacted Reddish Brown Earth and bedrock fragments on its top (Fig. 48). Reddish Brown Earth is found above the basal gravels and bedrock in the Citadel as either a sterile deposit or an occupational deposit, cut by postholes and with finds of artefacts. The earliest sedentary or semi-sedentary occupation of site ASW2 was during structural period K, finds from which place it in the peninsular Indian Iron Age techno-complex, while radiocarbon results suggest a date of between the ninth and the mid-fifth centuries BC. Finds from the second structural period, J, have been dated to between *circa* sixth and mid-fourth centuries BC (Coningham *et al.* 1996). The primary core of the rampart yielded no artefactual remains or charcoal samples and thus is almost impossible to date accurately. Although both structural periods K and J and the rampart core are cut into layers of Reddish Brown Earth or made from unmixed Reddish Brown Earth, this does not necessarily give a date of between *circa* eighth and mid-fourth centuries BC for the rampart. As stated above, the Reddish Brown Earth is also found in the Citadel sequence and elsewhere in Anuradhapura as a sterile or natural soil. It is very possible that if the rampart was constructed in a following structural period, its line would be outside the contemporary settlement and thus would involve the excavation and mounding of artefactually sterile deposits. Such sterile Reddish Brown Earth deposits were observed by the first author in the vicinity of the Rajaratta Hotel in Anuradhapura in a freshly cut, 2 m deep pond in 1992.

Phase two appears to consist of a mixture of Reddish Brown Earth and the phase four silty ash. It differs from the primary core in that the presence of fragments of kiln-fired tile and the absence of kiln-fired brick attributes the deposit to ASW2 structural period I. Phase three appears to be a talus of clay and sand overlying the Reddish Brown Earth and silty-ash deposit; it may even represent a cleaning out of the moat. Phase four of the rampart consisted of a raising of the rampart height and a broadening of its base; these works were effected with an ashy-silty deposit. The sixth structural period at ASW2, I, represented a structural watershed with the replacement of round buildings with cardinally orientated square ones. The soil matrix also changes from the humus-rich Reddish Brown Earth to an ashy-silty soil identical with that used in the fourth phase of rampart construction. Finds characteristic of structural period I were also recovered from the fourth rampart deposit, including a carnelian ring, a fragment of natural glass, an amethyst bead and Rouletted ware. ACRS phases two, three and four can be interpreted as being deposits contemporary with ASW2 structural period I and can thus also be allocated a date of between *circa* mid-fourth century BC and the very beginning of the second century BC (Coningham *et al.* 1996). This date appears to corroborate the chronicle's record of the re-foundation of Anuradhapura as a royal capital by Pandukabhaya, grandfather of King Devanampiya Tissa (*r.* 250–210 BC). The *Rajavaliya* states that 'he cleared a piece of ground, four gaw in length and the same in breadth, rooted out the trees, made streets, and constructed other works. He also built a rampart 16 gaw (in extent)' (*Raj.*22). In the *Rajavaliya*'s glossary one *gaw* is calculated as one fourth of a *yoduna*, which itself represents 16 miles (*Raj.*vii). It thus appears that the extent described must be an exaggeration, since it is estimated that the ramparts enclose some 100 hectares.

The fifth rampart phase consisted of the capping of the earlier ramparts with a brick superstructure or wall, although it appears that much of it was levelled to provide a foundation in the succeeding construction phase. The very large size of bricks appears to suggest that this phase can be correlated with the use of such brickbats at ASW2 in structural phases G and F. Structural phase G has been dated between *circa* the first quarter of the third century BC and the latter half of the first century AD, while structural period F can be assigned a date of between *circa* AD 200 and 600 (Coningham *et al.* 1996). The sixth rampart phase consisted of a further enlargement of the fortifications, a higher and wider rampart, and an ashlar and brickbat wall above (Fig. 49). The ashy-silt deposit used to raise the rampart appears to correlate to the ashy-silt occupation levels of ASW2's structural periods C, D, E and B. These four periods can be dated to between *circa* seventh and thirteenth centuries AD. The finds from the ACRS pits for this phase confirm the attributed date: the artefacts recovered included glass, West Asian ceramics, East Asian ceramics, glass bangles and later glass beads. The discovery of this monumental ashlar wall helps us to understand the reason for the hundreds of robber pits cut into the Citadel's earlier levels, obviously in order to recover building materials for the wall.

The seventh phase, consisting of a further raising of the rampart over the collapsed wall of phase six, is most difficult to date. This late grit deposit cannot be identified in any of the Citadel excavation pits and does not include any diagnostic finds. The phase can be interpreted as either of two depositional features. Firstly, it may represent an attempt to repair the collapsed defences, perhaps carried out during one of the many attempted restorations of Anuradhapura by Polonnaruva-period rulers, Vijayabahu I (*r.* AD 1055–1110) (*Cvs*.58.59), Parakramabahu I (r. 1153–86) (*Cvs*.74.1–14), Parakramabahu II (*r.* 1236–70) (*Cvs*.87.66) and Vijayabahu IV (*r.* 1270–72) (*Cvs*.88.83). Secondly, it may represent the spoil thrown up by Henry Parker's irrigation ditch, which was cut along the line of the old moat in 1873.

4.9 Conclusion

All four surveys successfully achieved their aims. It became very clear, however, that the surveys were far more useful when used in combination rather than applied in isolation. The surface survey and resistivity meter identified the ashlar wall, while the proton magnetometer, resistivity meter and soil auger identified the moat. As noted above, because we wanted to test the feasibility of using geophysical prospection in Sri Lanka we selected transects and areas which should have resulted in the recording of the moat, easily identifiable as a massive positive anomaly. It is clear from selected sectors that this has largely been the case. Our second aim was to identify the course of the wall around the entire site in order to draw attention to its course for preservation and to protect it from being built on or from becoming a quarry for building materials. We have completed a plan of these results and sent this to the Archaeological Survey Department. Thirdly, we wanted to plan the course of the defences in order to estimate the area enclosed by them. Initially we had hypothesized that, as the walls represented a fairly late construction phase, they would have enclosed only part of the site, reflecting a postulated decrease in the population of the city. However it is now clear that they enclose the entire 100-hectare site. Until the discovery of the Anuradhapura rampart, dated to between *ca.* mid-fourth century BC and the last quarter of the third century BC, the most southerly Early Historical walled urban complex in South Asia was Dhanyakataka on the River Krishna, although the fortifications of Banavasi in Karnataka may be proved to be of Early Historic date (*Indian Archaeology: A Review* [*IRA*] 1971: 29). With the extension of the distribution to Sri Lanka, it is now obvious that the second South Asian emergence of complex societies and urbanism was not just the result of Mauryan imperial conquest, nor purely a northern phenomenon. Anuradhapura can now be added to the list of major Early Historic central places, proving that the distribution of these sites does extend outside the perimeters of North India and indeed the Mauryan empire. The early date of the city's fortifications also suggests that it was established as a major settlement before, according to the *Mahavamsa*, Emperor Asoka sent his son Mahinda to convert the island. As discussed in a preliminary note elsewhere (Coningham 1993), it is possible to use this new data from Anuradhapura to re-examine the possible factors behind the presence of the early fortifications at the Citadel.

Defence appears to have been, logically perhaps, one of the earliest explanations for the massive Early Historic ramparts of South Asia. Certainly there can be little doubt that the walls, gateways and bastions of Sisupalgarh in Orissa were defensive. Indeed Wheeler, an experienced military man, classified the site as a fortress-town (Wheeler 1959: 134). Allchin has added further corroboration to this hypothesis for the emergence of the fortified city by stating (Allchin 1989: 4) that:

> ... as the construction of these ramparts coincides with the period of emerging cities and states, and of the internecine warfare, the matsya nyaya of the Sanskrit apothegm, when state swallowed up state, until Maghadha emerged as a single overall political power, the thesis that defense was primarily against man, even though to a lesser extent against animals and floods, seems most plausible.

Mate has criticized the thesis that defence was the prime motive for the construction of these fortifications because there was no provision of a parapet and because the gentle slope of the outer face of the earliest examples made them vulnerable to attack (Mate 1970). He interprets the moats as diversion channels to ease rivers in spate and bypass the cities, rather than as part of a formally planned defensive complex. The absence of parapets on the ramparts of Ujjain, Kausambi and Rajghat is put forward as evidence to support this thesis, and he suggests that parapets were only built in the latter part of the first millennium BC. This conclusion appears to ignore the factor of archaeological survival. It is unlikely that early parapets will survive, as they will be eroded or levelled as the underlying rampart is utilized as a solid foundation for further constructional additions to the walls.

Following his critique of the defensive theory, we have seen that Mate replaced it with another prime mover, that of the rampart as a flood barrier or embankment. The early archaeological levels at Hastinapura may provide some evidence for this theory. At the end of period II, characterized by finds of Painted Grey Ware, the 2.6 m high settlement mound was partially washed away by a great river flood. This natural disaster led to the abandonment of the site and evidently 'must have entailed enormous loss of life and property' (Lal 1955: 15). Further evidence for this theory may be found in the sequence of Rajghat's 10 m high clay rampart. The excavator, Narain, stated that 'a series of alternating deposits of sand and silt against the toe of the rampart indicated that it has been breached several times by heavy floods, which had affected some portions of the habitation' (*IAR* 1961: 37). Banerjee, the excavator of Ujjain, interpreted the addition of a timber framework to the early rampart of period I as a measure to protect a damaged section of wall from river erosion. However, Erdosy has noted that, as the framework was located on the inward bend of the river, it protected the city from erosion, not flooding as Mate had hypothesized (Erdosy 1988: 114). It may also be noted that there are a number of examples of early walled sites in areas not affected by flooding. Rajgir, for example, was equipped with a defensive rubble wall running along the tops of the surrounding hills (Ghosh 1951: 66). Erdosy accepts Mate's critique of the defensive prime mover but also criticizes the latter's flood-barrier hypothesis as inadequate to explain the sheer monumentality of a number of the fortifications (Erdosy 1988: 114). He also calculates that the rampart at Ujjain would have taken a labour force of 20,000 men over 250 days to complete (ibid.). In view of the vast expense incurred he appears to favour a symbolic prime mover and comments (ibid.) that:

> Mumford's stress on the symbolic significance of city walls, later developed by Wheatley into a contrast between sacred (urban) and profane (rural) space, provides the best explanation. Cities can thus be viewed as attempts to recreate the universe in microcosm, which needed explicitly symbolic protection in the shape of the outsized ramparts.

Thus the city represents a model of the universe, the walls of the city represent the boundary of the universe and – by extension – the king represented the king of the universe!

An attempt to allocate a single prime mover or function to the Citadel ramparts at Anuradhapura appears to be rather pointless as there are examples which support all of these factors. The rampart and moat doubtless functioned as part of a defensive unit. The Sinhalese chronicles document warfare from the earliest times, either against indigenous inhabitants, among the Sinhalese themselves, or against foreign expansionists and adventurers. The newly arrived Vijayan adventurers are thus recorded as having fought and defeated the native Yakkhas in order to settle the island safely (*Mvs*.vii.36–38). A few generations later the Sinhalese are recorded as having successional wars. Pandukabhaya, grandfather of King Devanampiya Tissa (*r*. 250–210 BC), thus had to defeat eight uncles before he could claim kingship (*Mvs*.x.64–72). The chronicles also record that two South Indian adventurers usurped King Suratissa's throne during the last part of the second century BC (*Mvs*.xxi.10–11). It may be concluded that in order to retain, or obtain, kingship, a strong army and fortress were prerequisites! The function of a rampart as a flood embarkment also appears to be satisfactorily supported by examples of natural disasters in the recent history of the island. The Dry Zone of northern and southern Sri Lanka has periodic wet-season cyclones which, in combination with heavy rains, have caused tanks to burst and rivers to flood. In December 1957 the New Town of Anuradhapura was flooded under some 2–3 m of flood water when the Malvatu Oya rose 9 m while in spate, and Parker records that in 1897 over 1 m of rain fell in just 27 hours (Parker 1909: 369). Such examples give evidence that flood barriers would have been very necessary and could have utilized the simple tank embankment technology available at that time. The early symbolic function of the rampart at Anuradhapura is more difficult to evaluate, partly because of the limited nature of the excavations at the Citadel, although there are many later conspicuous examples in the island (Coningham 1993). However we may rely, with caution, on the description of the refoundation of the settlement of Anuradhapura by King Pandukabhaya after his coronation, as documented in the *Mahavamsa* (*Mvs*.x.73–102). As discussed in Chapter 3.3 above, the king consulted a soothsayer and a site specialist before constructing the city and allocating different social groups and structures to specific loci. The very fortifications and urban plan may have been mnemonic of daily life or rather – as Thapar suggests (1984: 91) – symbolic in that:

> The fortifications enclosed the urban settlement and separated it from the surrounding areas ... thus demarcating the urban from the rural... Fortifications also served to segregate excluded social groups such as the Candalas who lived in villages in the vicinity.

Part of the function of the early ramparts was undoubtedly to exclude enemies, prevent flooding and act as a symbol of the king's ritual and cosmic role. However, one factor appears to have been omitted from this list of multivariants – the protection of crops. One of the most obvious features of early historic cities is the enormous hectarage enclosed. Erdosy calculates that 11 Gangetic examples covered over 100 hectares (Erdosy 1988: 134). It is highly improbable that in the early phases of these settlements all of the enclosed area was occupied by housing. Erdosy calculates that Kausambi's defences were erected *c*. 500 BC and enclosed 250 hectares. However, according to his surface survey, only 50 hectares were occupied in period II (600–350 BC) (ibid.: 60) and only 150 hectares in phase III (350–100 BC) (ibid.: 72). Erdosy's calculation thus leaves a huge percentage of land within the ramparts unoccupied by settlement: 80 percent in period II and 40 percent in period III. It is highly probable that much of this land was occupied by market or kitchen gardens and groves of fruit trees. This pattern also appears to have been detected at

Anuradhapura. The ramparts of structural phase I there enclosed an area of 100 hectares, two thirds of which were occupied, leaving a third unoccupied. Contemporary subsistence strategies in North Central Province generally rely upon three main traditional techniques: tank-irrigated rice, *chena* (slash and burn), and the cultivation of garden plots (Leach 1961). All these options necessitate some degree of protection for the crops, especially in the more isolated settlements in jungle areas. When crops of irrigated rice-fields are near harvesting, a watch is normally kept day and night to ensure that they are not destroyed either by wild pigs and deer or by domestic buffalo and cows. *Chena* or newly cleared areas are far more difficult to protect, but they are vital because they supplement the mainly rice-based diet. Baker recorded that Korrakan, maize, Indian corn, millet and pumpkins were grown on such land (Baker 1855: 35). Although most areas of *chena* are fenced, pigs can dig under them, deer can jump over them and elephants can trample them down. Often, in more remote areas, farmers still build platforms in tall trees where they light fires and shout and shake rattles all night to protect themselves and their crops from wild animals. Village gardens also supplement the rice diet in the form of the yields from coconut palms and fruit trees, as noted by Knox in the seventeenth century (Knox 1911: 141). The former, if unprotected, were often knocked down by elephants trying to reach the succulent tops (Baker 1855: 46). Indeed, elephants were such a menace to the economy of the island in the nineteenth century that the Government offered 10 shillings an elephant tail in certain areas, although this was soon abolished because the Government quickly found the bounty too expensive (ibid.: 67). It is worth noting that it is well within the capacity of an adult elephant to eat over 1000 pounds of fodder in an hour (Deraniyagala 1955). Domestic livestock was also at risk from jackals and leopards, and the English inhabitants of Nuwara Eliya suffered badly from the latter (Baker 1955: 59). In view of the above evidence it appears no surprise that when Robert Knox acquired some land in the hill country and built a house there in 1666, the first action he took was to 'intrench it round with a ditch, and planted a hedge' (Knox 1911: 141). Even so, he records that the enclosed land was often broken into by sambhur, wild pigs and leopards (ibid.: 26–27). His second house and land were similarly defended against wild animals, and the entrances were protected by thorn fences (ibid.: 149). Similar defensive enclosures are described in connection with a twelfth-century AD village in the *Culavamsa* (*Cvs*.66.87).

We may therefore surmise that the first fortified settlement at the Citadel of Anuradhapura enclosed an area of some 100 hectares, of which slightly more than two thirds were occupied. Part of the impetus for this enormous work may have been as a symbolic barrier between order and disorder, or a defensive fortification against flooding or against inhabitants from hostile polities or settlements. However, it also provided a physical barrier which wild pigs, deer, leopards, jackals and wild elephants could not surmount, trample down or dig under to reach the kitchen gardens, fruit trees or crops that may have been planted on the remaining unoccupied third of the settlement. It is also clear that the earliest rampart at Anuradhapura represents a large investment of communal action. The ramparts run for some 2980 m, are some 2.10 m high and have an estimated width of 8 m (Fig. 50). Their volume can be calculated at around 50,064 m^3. We can calculate the number of man-days taken to build the rampart by using a rate of 0.58 m^3 per man-day, based upon observations of nineteenth-century canal digging (Erdosy 1988: 113). They are equal to 86,317.241 man-days or, if one assumes that the rampart was built well within the dry season when excess labour was available, one may calculate that it would have taken a postulated workforce of 575 a total of 150 days. The mobilization of large numbers of people is also suggested from the construction of large tanks for irrigated rice and the watering of growing numbers of livestock and people. The change to the environment and the drop in the water-table is archaeologically visible: the shallow watering holes of structural periods J and K were replaced during period I by deep wells cut through the underlying deposits and into the bedrock. These collective works mark Anuradhapura as the primate city and illustrate the island's earliest example of the ability to mobilize a large labour force in the field. They thus mark the beginning of complex societies in Sri Lanka which culminated in the classical Anuradhapura period.

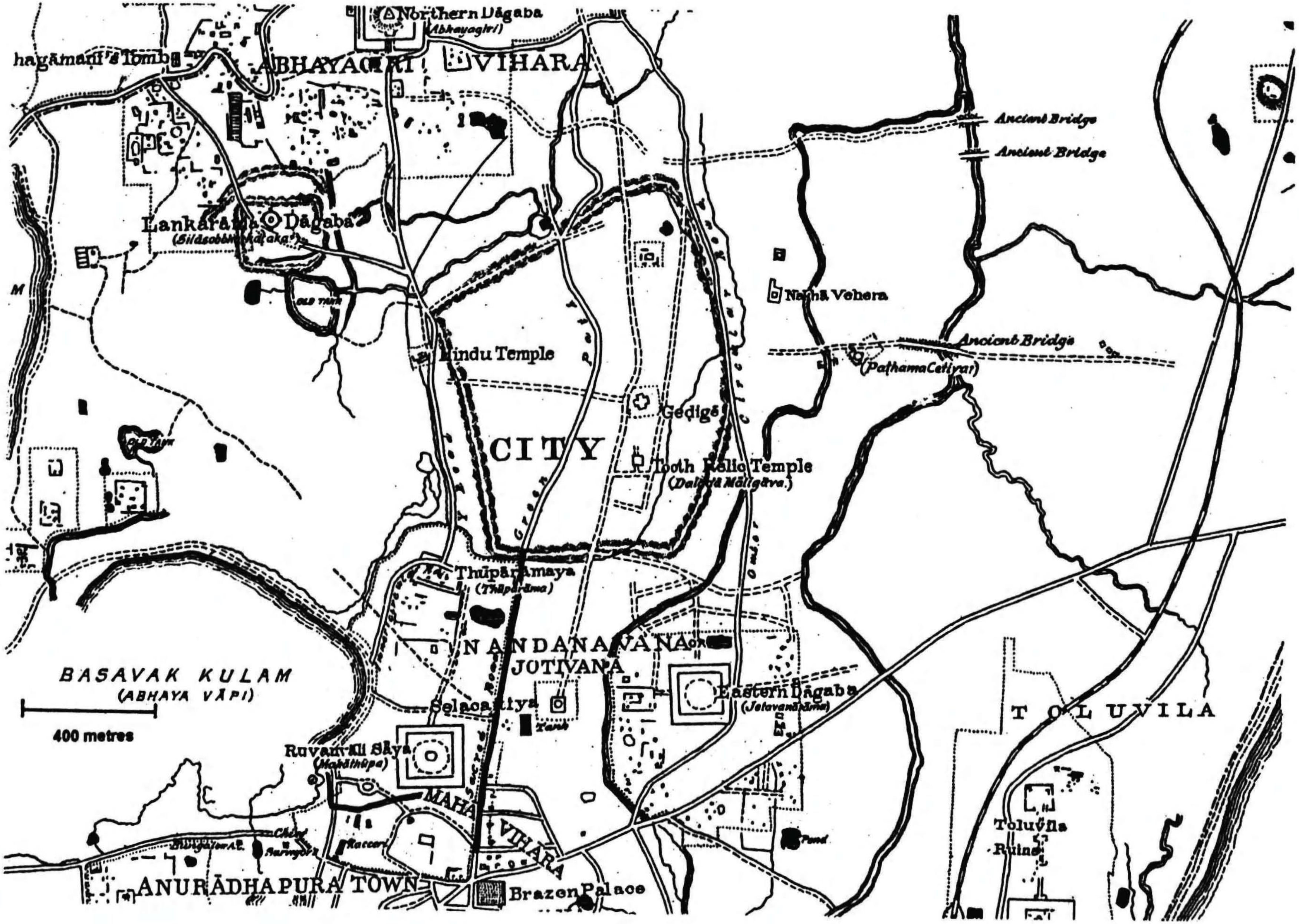
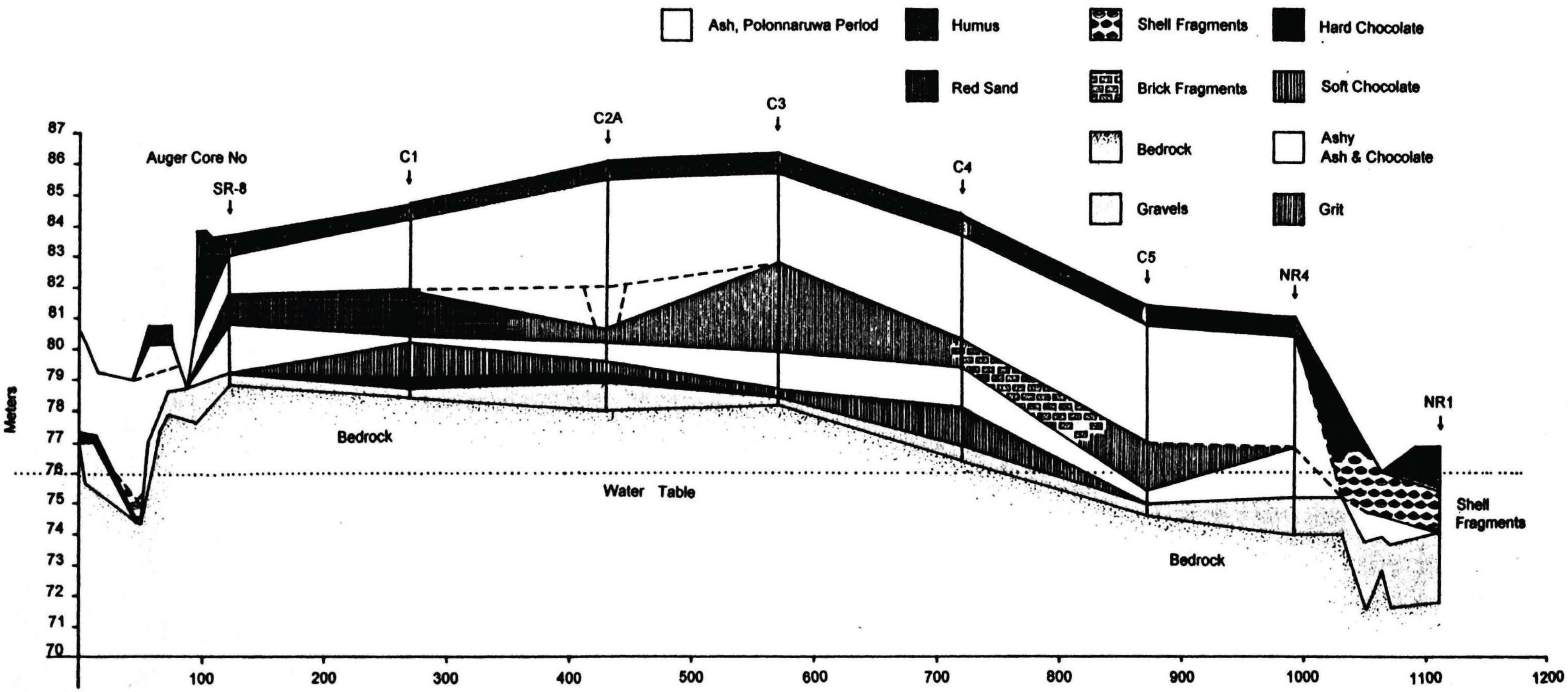


Fig. 31: Plan of the Citadel (after Hocart 1924)



Soil Auger Results - South to North Cross Section.
Anuradhapura Citadel 1994.

Fig. 32: Auger core profile through the Citadel

Fig. 34: The northern fortifications in situ

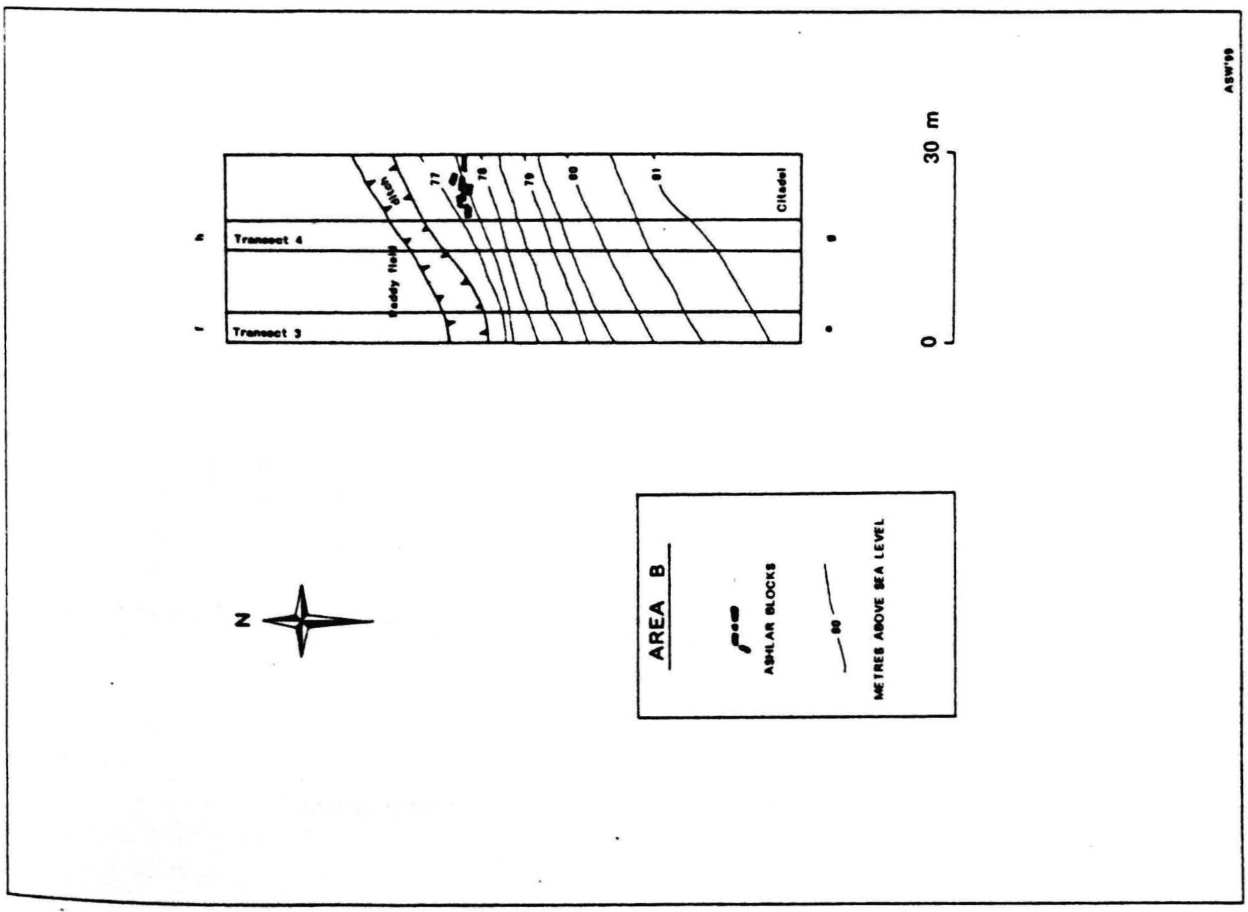
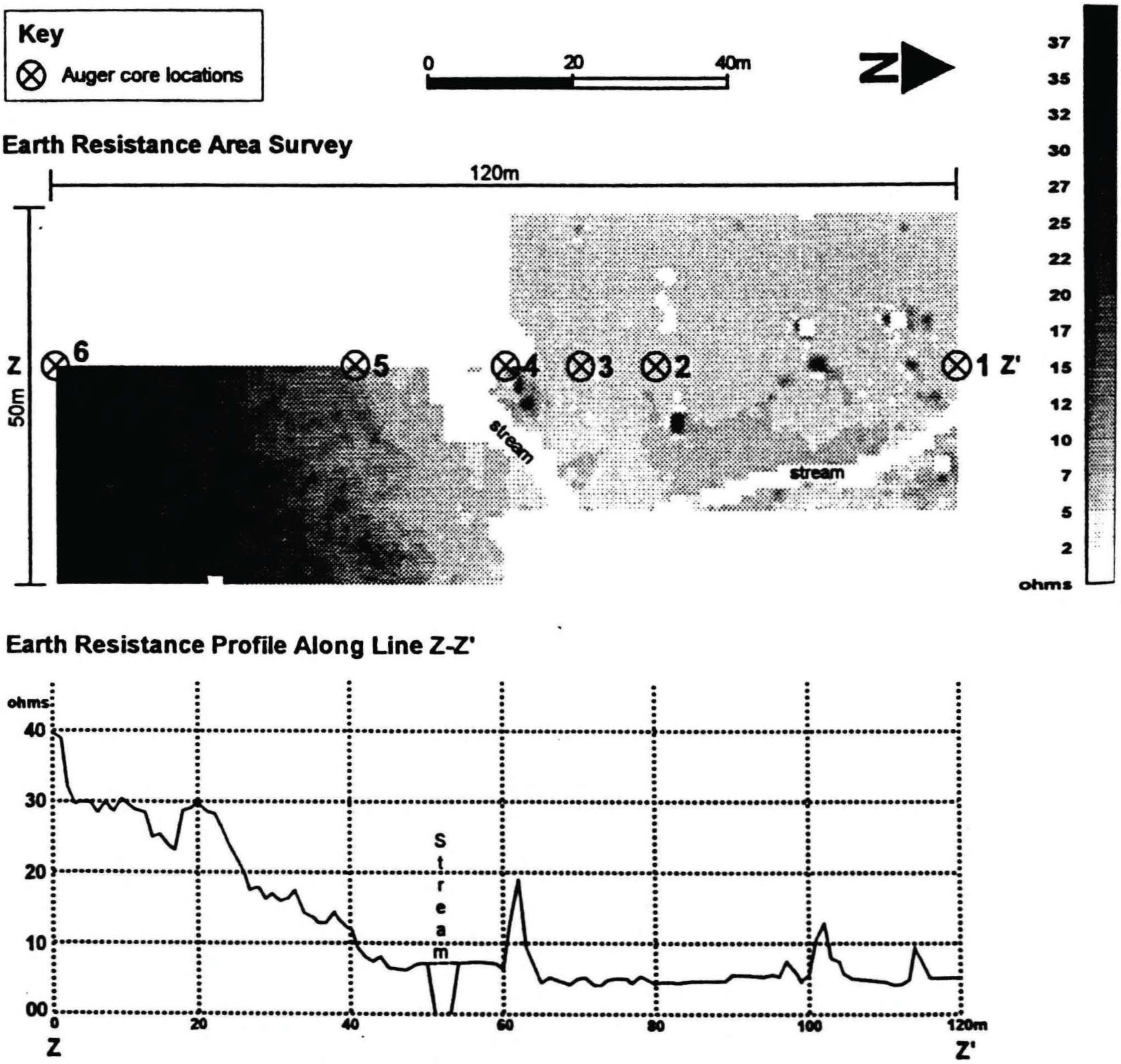


Fig. 33: Plan of the northern survey sector

The Fortifications of the Citadel of Anuradhapura: Northern Sector
Twin Probe Earth Resistance Survey
0.5m mobile probe separation
1.0x1.0m spatial resolution



Note: The profile shown is the mean of three 1m spaced transect profiles centred on the line Z-Z' (transect profile resistance values extracted from the area survey).

Fig. 35: Resistance survey of the northern fortifications

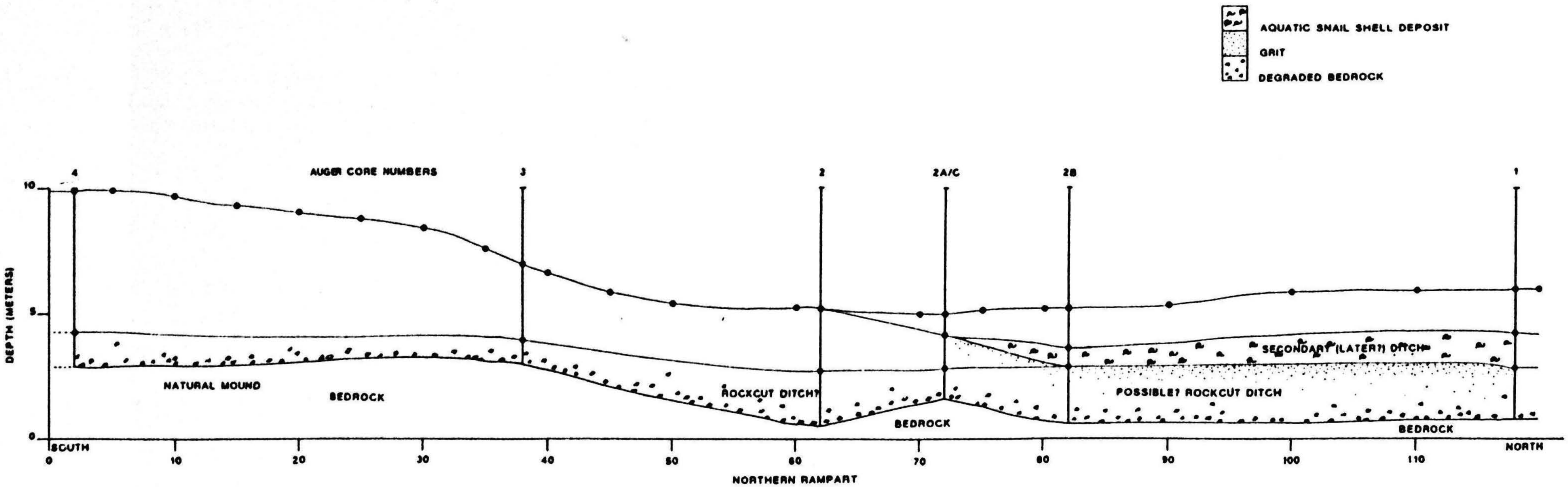


Fig. 36: Auger core profile through the northern fortifications

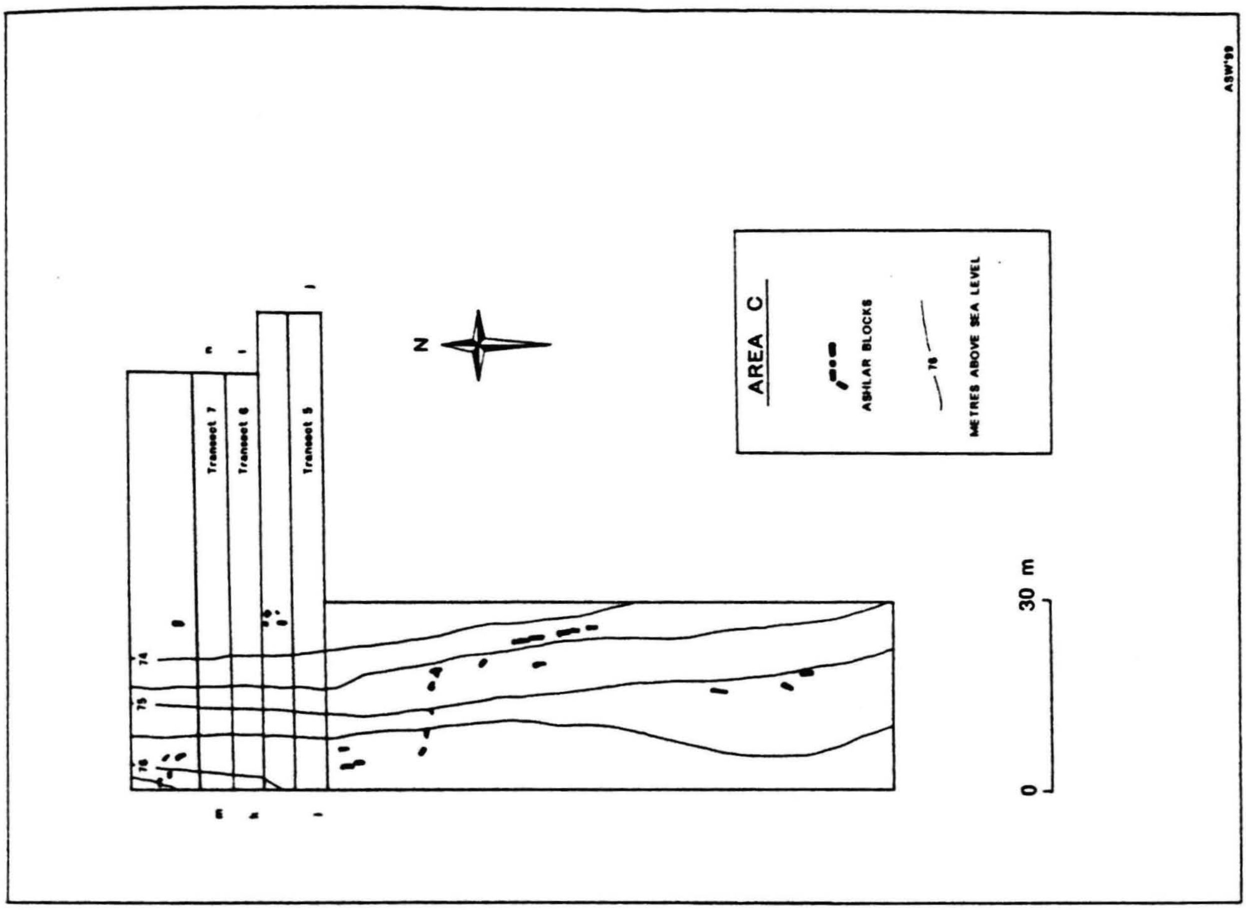


Fig. 37: Plan of the eastern survey sector

Fig. 38: The eastern fortifications

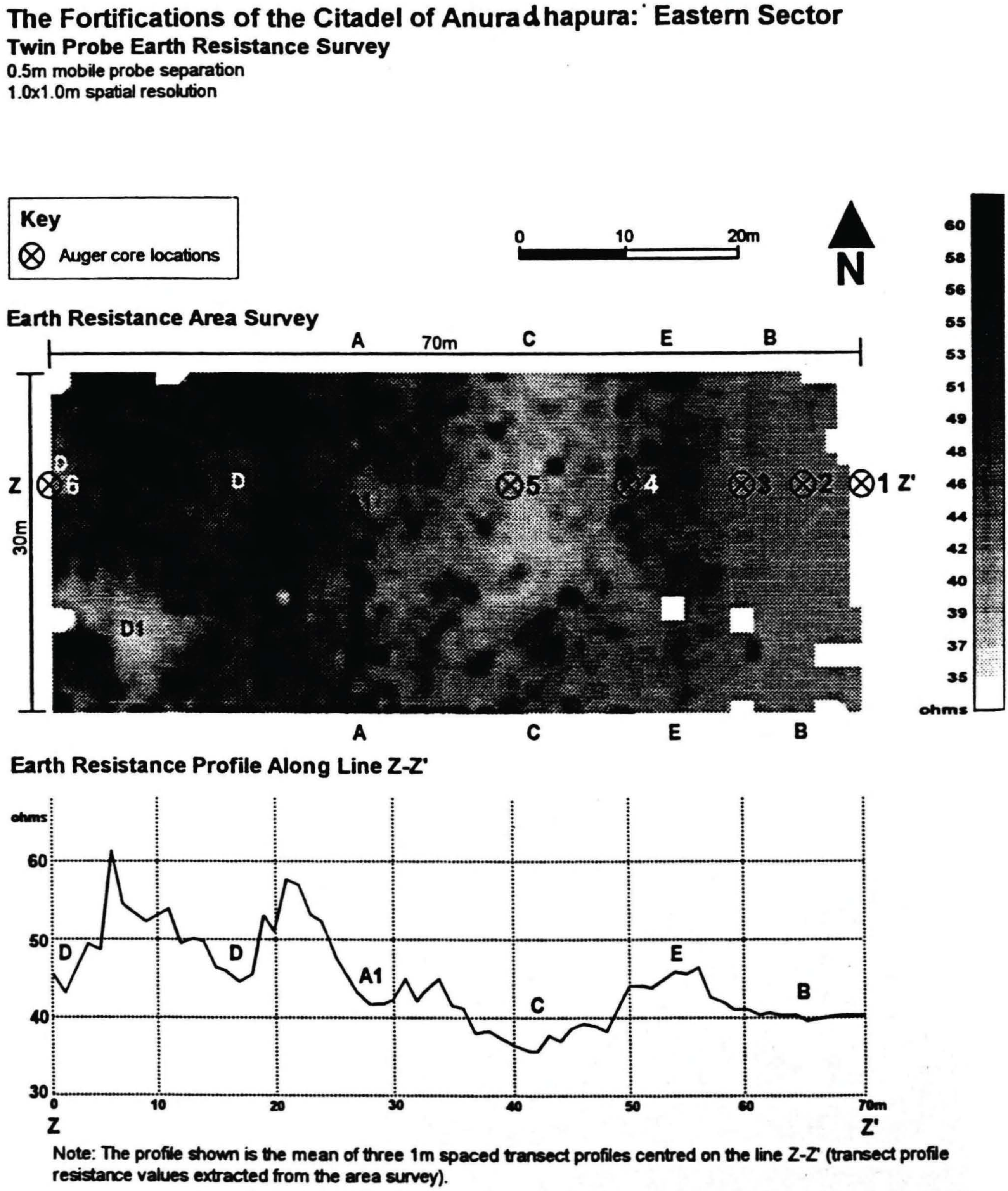


Fig. 39: Resistance survey of the eastern fortifications

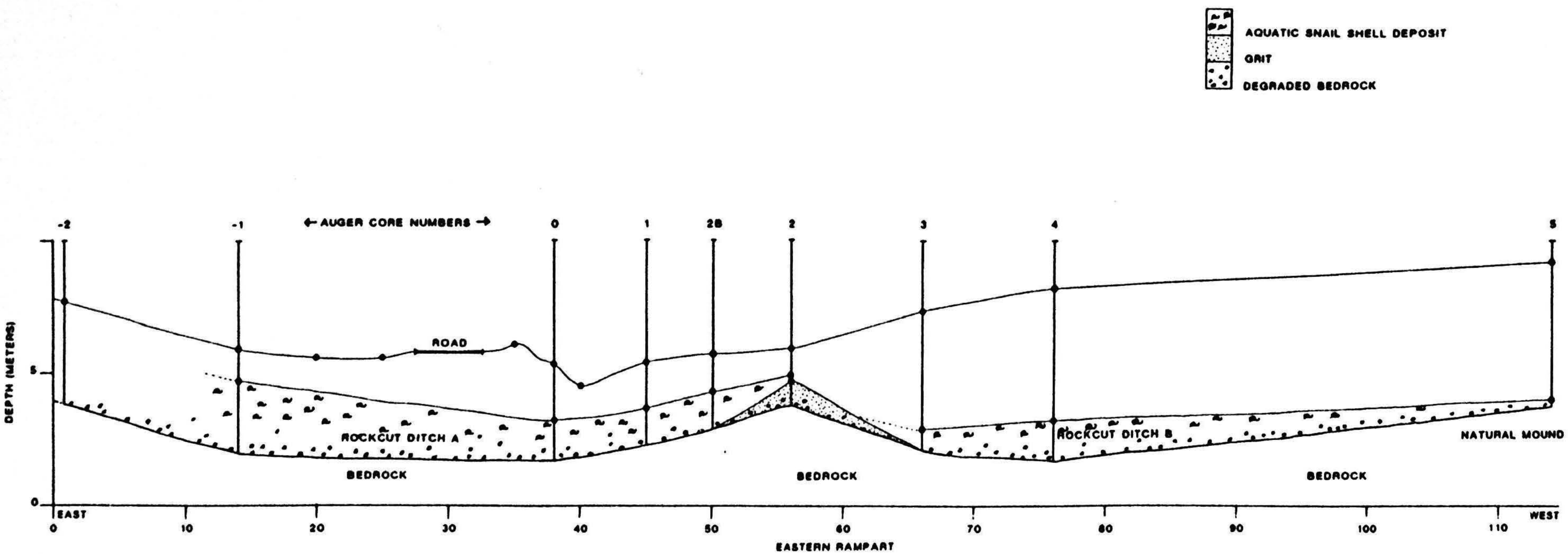


Fig. 40: Auger core profile through the eastern fortifications

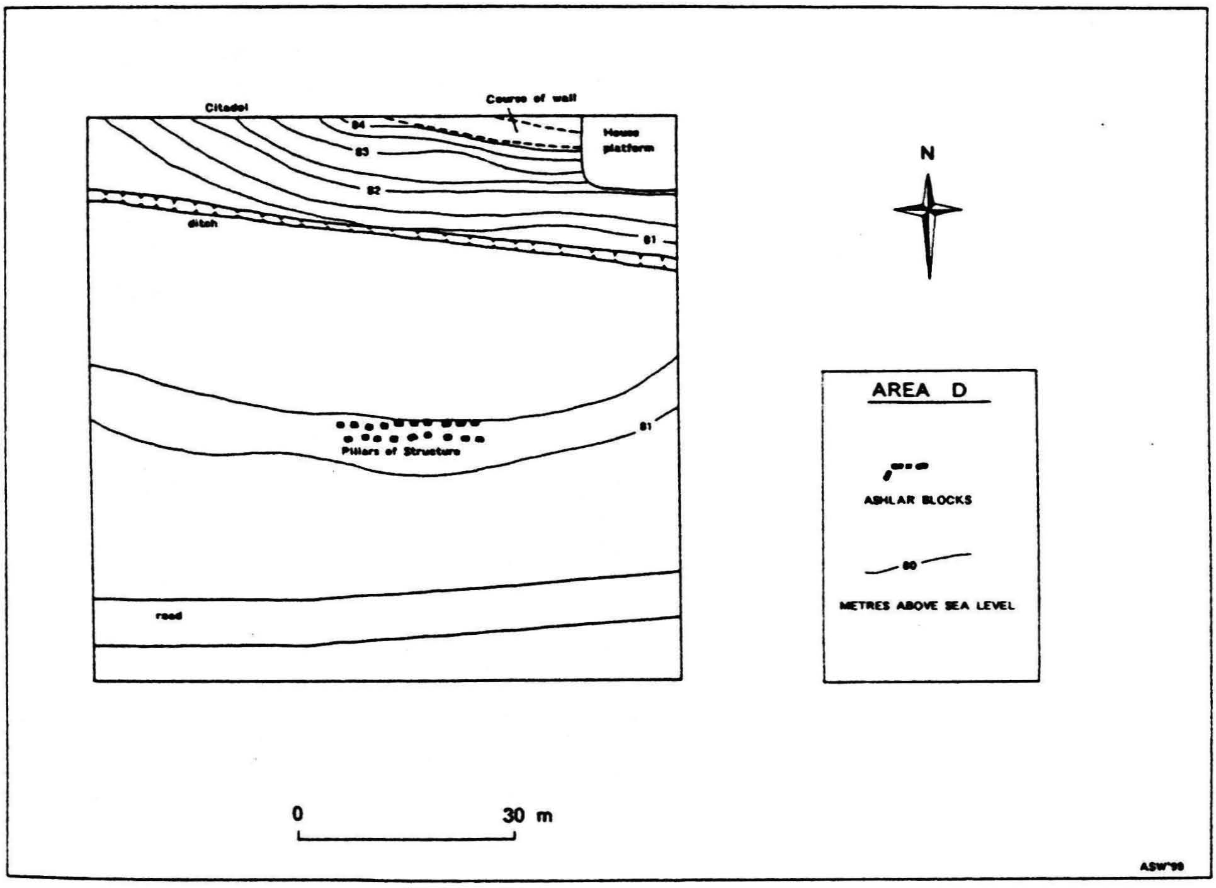


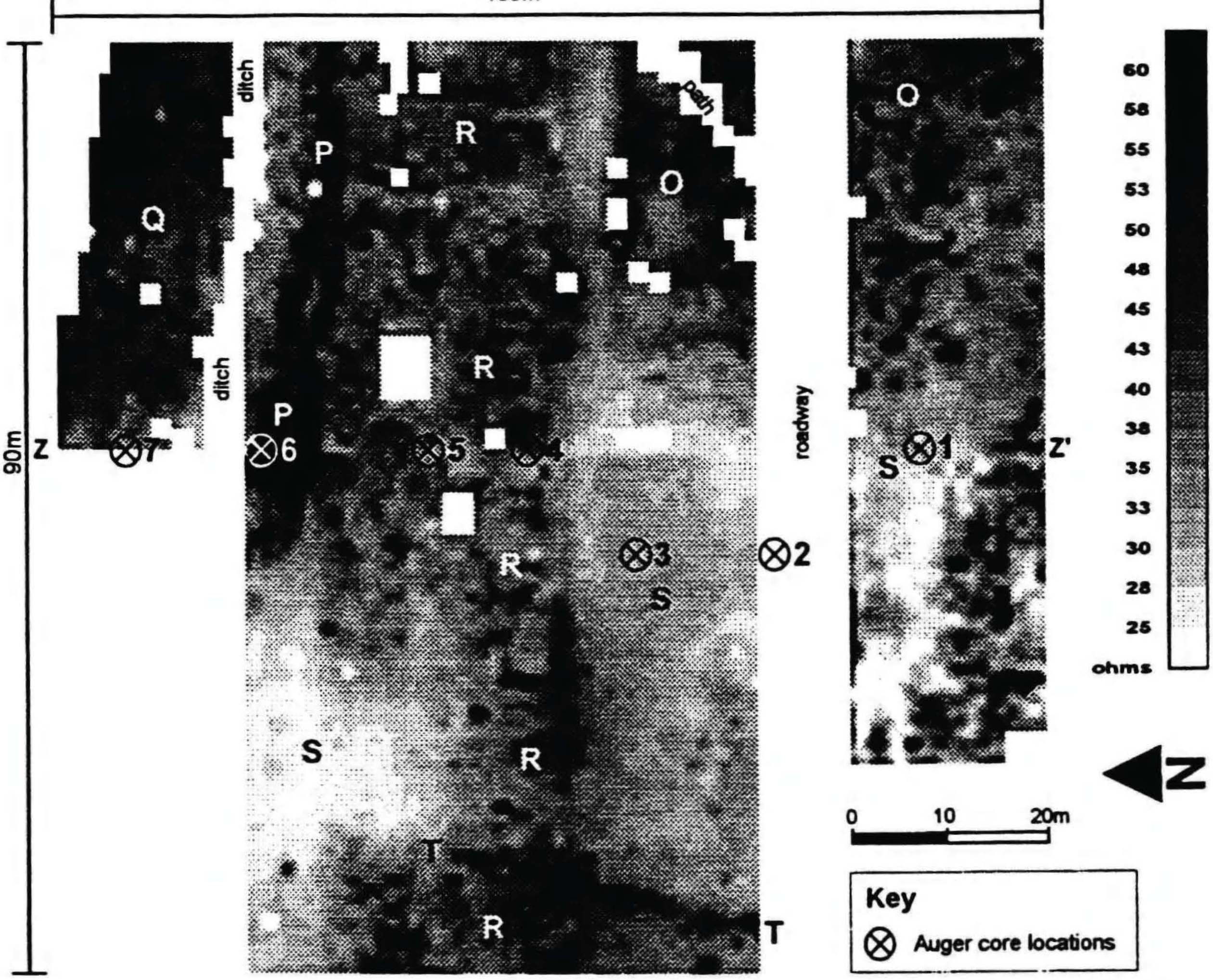
Fig. 41: Plan of the southern survey sector

The Fortifications of the Citadel of Anuradhapura: Southern Sector

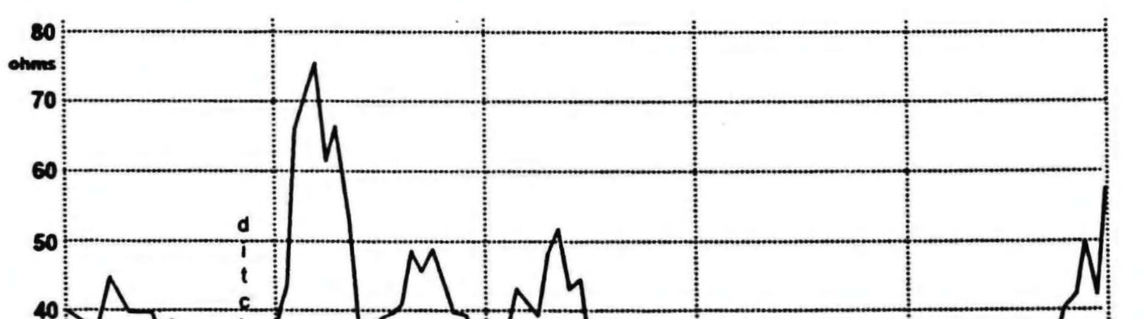
Twin Probe Earth Resistance Survey

0.5m mobile probe separation
1.0x1.0m spatial resolution

Earth Resistance Area Survey



Earth Resistance Profile Along Line Z-Z'



Note: The profile shown is the mean of three 1m spaced transect profiles centred on the line Z-Z' (transect profile resistance values extracted from the area survey).

Fig. 42: Resistance survey of the southern fortifications

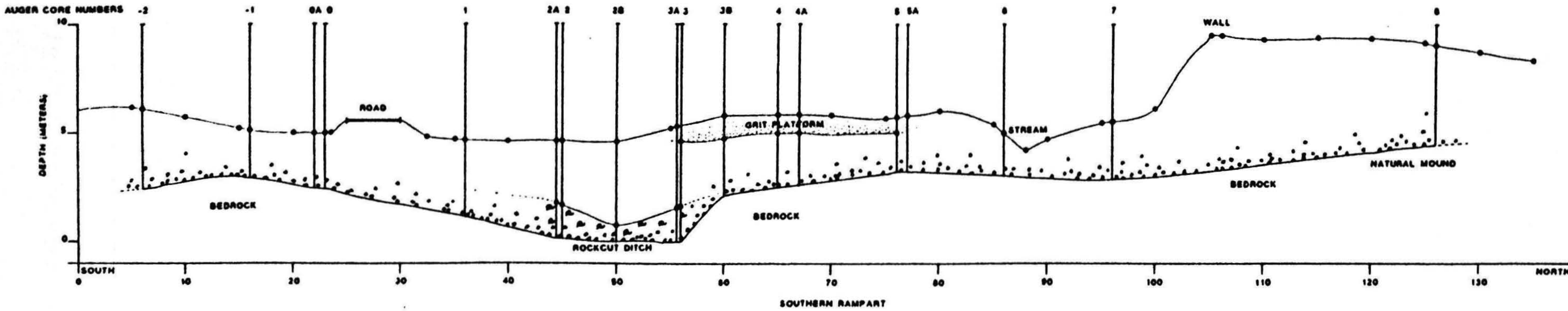


Fig. 43: Auger core profile through the southern fortifications

Fig. 44: The southern fortifications

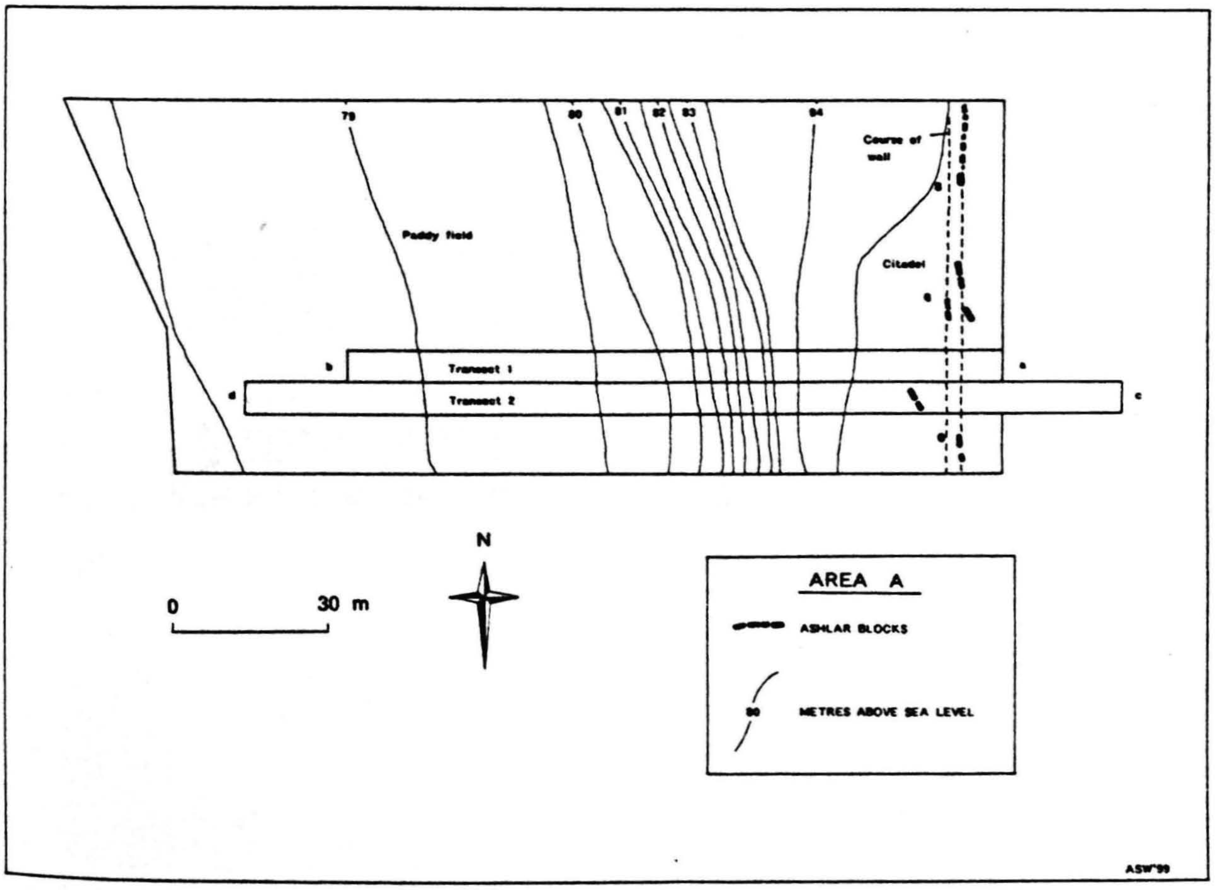


Fig. 45: Plan of the western survey sector

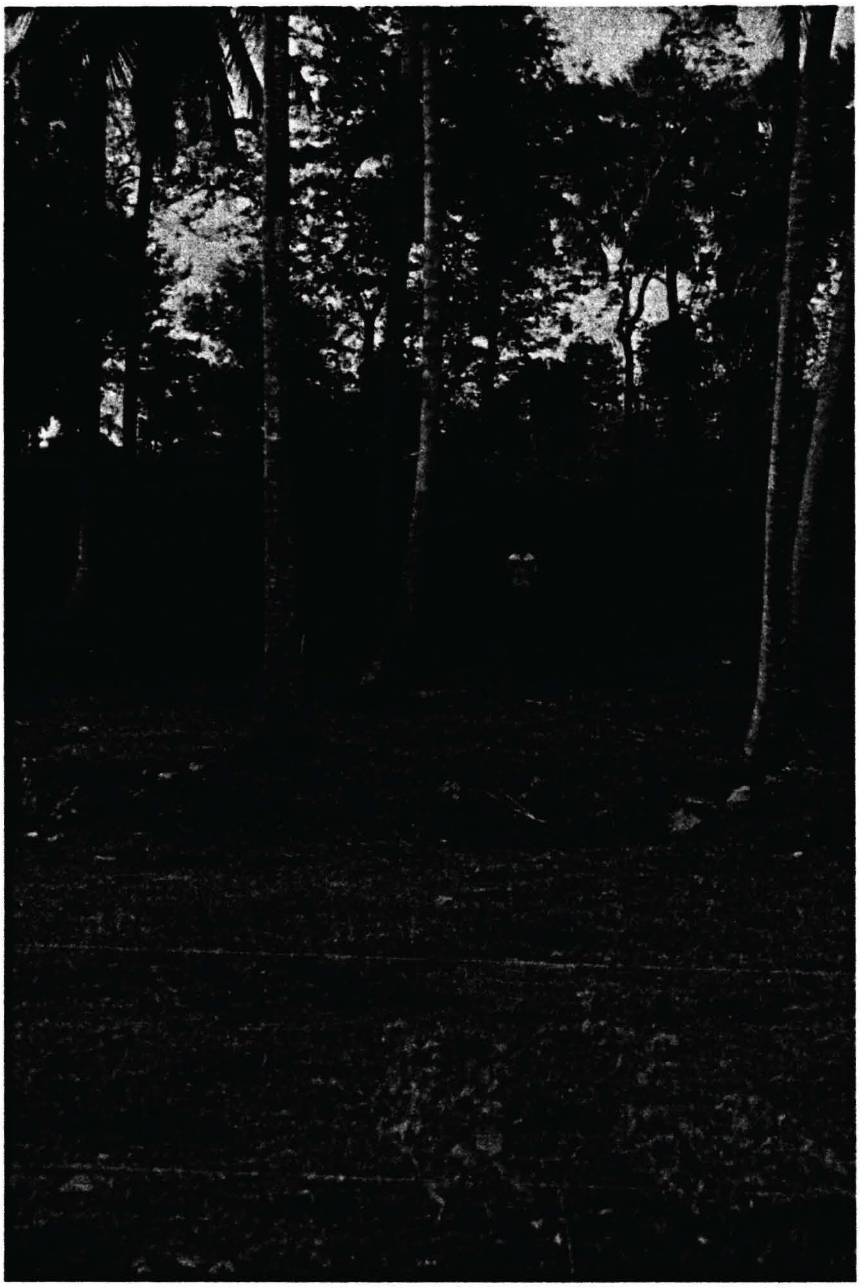


Fig. 46: The western fortifications

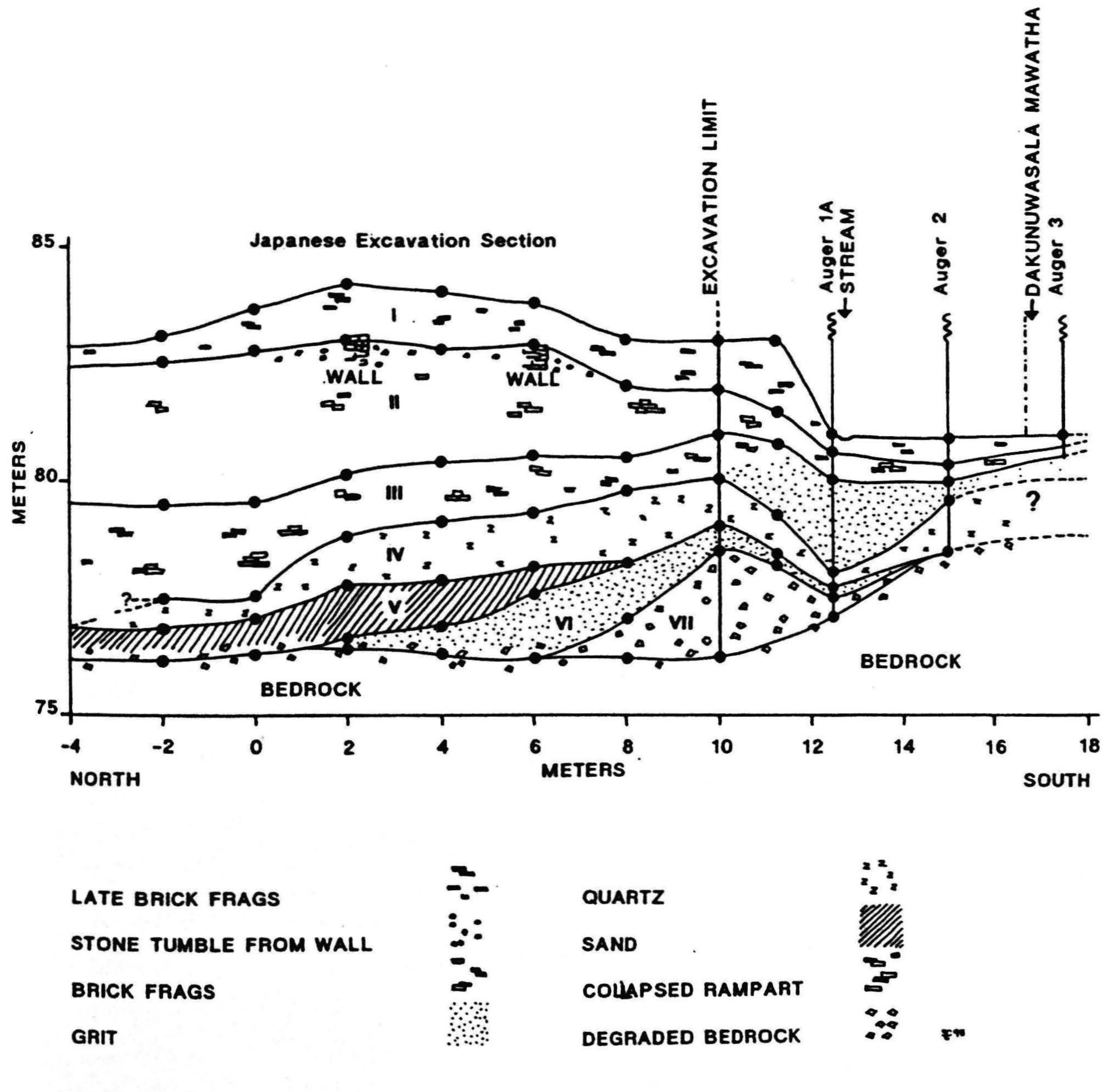


Fig. 47: Section and auger profile through the southern rampart

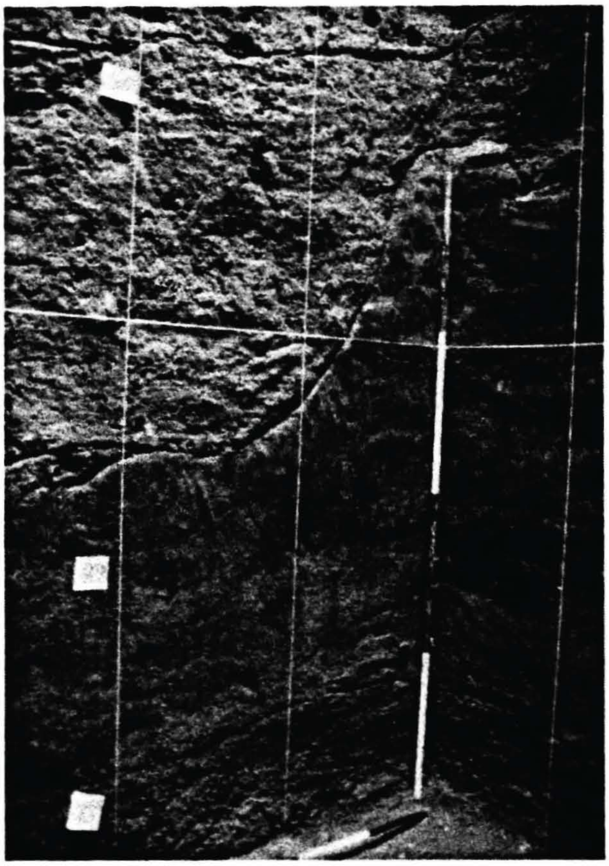


Fig. 48: Primary rampart construction phase

Fig. 49: Sixth rampart construction phase

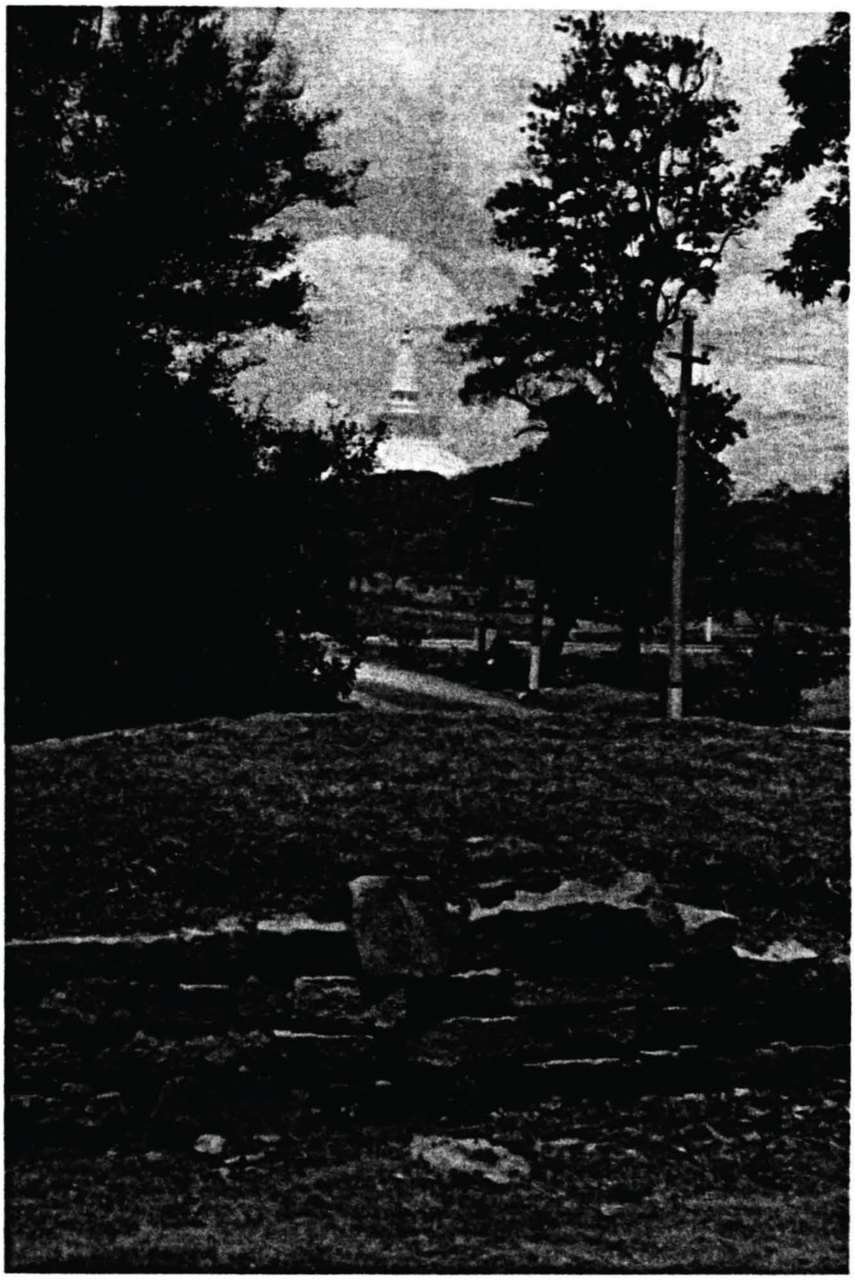


Fig. 50: View from the southern fortifications to the Mahathupa

CHAPTER 5

THE EXCAVATIONS AT ANURADHAPURA SALGAHA WATTA 2

Robin Coningham

5.1 Introduction

The trench Anuradhapura Salgaha Watta 2 (ASW2) was designed with two main objectives in mind: firstly, to recover a structural sequence from the site; and, secondly, to provide sufficient artefacts to allow the construction of a periodized catalogue. In meeting these aims we had to design a trench which was large enough to identify structures - as well as mixed deposits, the result of robber pits, well digging and other intrusive features - but small enough to be covered by a roof to protect the excavation (and excavators) from the sun, rain and, in one case, the falling bough of a tree. The result was ASW2, a cardinally oriented trench covering an area of 100 square metres, with a 4 sq. m earth pillar (centre-point) to support the central pole of the scaffolding frame roof (Pl. Va). As a roof of corrugated iron sheets was found to let in insufficient light, these were spaced by clear plastic corrugated sheets. At a depth of 4 m it became necessary to step the trench in 1 m to facilitate the removal of spoil. Our second task was to locate the trench in an area where we would be able to excavate a full structural and artefactual sequence. With this aim in mind, on the recommendation of Dr Deraniyagala we located the trench next to sondage ASW1, which had been sited at one of the highest points of the tell, some 87 m above sea level, and which had struck bedrock at a depth of almost 10 m below the surface (Fig. 51). Deraniyagala's sondage sequence, though partially disturbed, suggested that the sequence went back to the initial occupation of the site in the Iron Age (Deraniyagala 1990). The decisive factor was the presence at the site of the exposed tops of four gneiss pillars, suggesting that the pillared structure, and hopefully the deposits below, had not been too badly disturbed by robber pitting (Fig. 52). The trench was excavated for three seasons, and during this time it became clear that all our initial aims and objectives had been more than met. We had excavated a sequence that ran through the site's development from an Iron Age village to one of the key South Asian medieval metropolises.

During the three seasons of excavation and two successive seasons of field surveys the entire mound was gridded into blocks of 30 square metres each. The coordinates of our trench ASW2 were 32N/11E. It was excavated according to the context system down to bedrock at a depth of 9.5 m below the present surface (Fig. 53). Each differentiated archaeological feature or deposit (e.g. posthole, posthole filling, pit, pit filling etc.) was given a unique context number. A context sheet was filled out for each context number, recording its location, texture, compaction, Munsell colour, cultural context and relationship to other context numbers. All major contexts were recorded on plans and sections and were photographed. Sections of the trench walls were drawn as the excavation proceeded. A Harris matrix was constructed to show the stratigraphic relationships of contexts. All deposits were sieved in order to ensure sample integrity. Each small or special find (sf), carbon or environmental sample was given a unique number in addition to its context number, and its recovery spot was recorded three-dimensionally if possible.

In order to simplify the 1887 contexts, 118 stratigraphic phases, 515 postholes, 77 pits, 42 walls, 38 slots, 17 ovens and 3 wells (and all their single and multiple fills), we have divided the results of the excavation into a sequence of 30 structural phases within 11 structural periods. The following description is given in reverse order of excavation, that is the oldest contexts are introduced first, and full details of the contexts can be obtained from Appendix B. Where possible, an attempt has been made to cite analogous buildings from other prehistoric and historic sites, both within Sri Lanka and elsewhere on the subcontinent, in order to provide a comprehensive periodized structural sequence to accompany the periodized artefactual sequences published in Volume II. With over 100 years of early historic archaeology within South Asia, one would assume that there would be many published excavations with which one might compare ASW2's structural sequence. However, the reality is very different. Owing to a preoccupation with monumental structures, the use of small sondage or test pits in habitation sites and the problem of non-publication or only partial publication, there are very few comparative examples, as will be illustrated below.

5.2 Structural period K

The earliest structural phase, K1, consisted of 29 postholes cut during stratigraphic phase V into old land surface 1811 (Fig. 54). This latter was a 0.00–0.35 m sandy clay layer with a number of exposed patches of underlying gravel (1887) on the flanks of a north–south outcrop of gneiss boulders deposited during stratigraphic phase IV. The postholes were clustered in two groups, one in the northeastern quadrant, the other in the northwestern quadrant. The latter cluster, consisting of twelve postholes, appeared to define an inner ring of seven postholes (1844, 1846, 1848, 1850, 1852, 1865 and 1867) 0.60 m to the west of a 0.90 m long alignment of five postholes (1834, 1836, 1838, 1840 and 1873). Although the northeastern cluster consisted of a similar number of postholes, eleven, the form of the structure or structures was less distinct but appeared to duplicate a similar pattern, that of an inner ring of postholes (1812, 1814, 1816, 1822 and 1824) surrounded by an outer arc (1820, 1826, 1861, 1863 and 1871). As the postholes had an average mean diameter of 0.08 m and an average mean depth of 0.06 m, they represent, perhaps, little more than the traces of temporary bivouacs that sheltered inhabitants from the sun, wind or rain. It is stratigraphically unclear whether these structures are contemporary; however, their location beside the boulder outcrop may have been for additional protection. Apart from the posthole concentrations, no flooring or occupation areas were identified, any such traces having presumably been destroyed by erosion.

Following the abandonment of the structures of K1, they appear to have been sealed by a 0.02–0.25 m thick sandy clay (1714) during stratigraphic phase VI. The rich humus content of 1714 suggests a natural origin. During the second structural phase, K2, 47 postholes and one pit (1755) were cut during stratigraphic phase VII into old land surface 1714 (Fig. 55). That structures were becoming more solid and perhaps more permanent is supported by the increase in the average diameter of postholes from 0.08 to 0.12 m. K1's northeastern posthole concentration was repeated, although K2's six postholes (1732, 1735, 1739, 1787, 1807 and 1809) and four associated stone slabs did appear to suggest an indistinct circular structure which extended under the trench's northern and eastern sections. As in the case of K1's structures, the function of this structure is unclear. K1's northwestern posthole concentration was also repeated, with a semicircular arc of postholes (1723, 1725, 1728, 1730, 1741, 1743, 1759, 1763, 1765, 1767, 1769, 1771, 1775, 1777, 1779, 1781, 1783, 1803 and 1805) which appeared to centre on a roughly circular burnt area of 0.65 m in diameter. It is presumed that this latter feature can be interpreted as a shelter or screen protecting a burning area, perhaps a hearth. The function of other postholes cut into 1714 remains unclear. Elements of structural repetition in subsequent structural phases suggest an element of continuous occupation at this locality, perhaps even seasonal in use.

Old land surface 1714 and associated features cut into its surface were sealed by the formation of 0.01–0.15 m thick sandy clay 1616 during stratigraphic phase IX, again presumably a natural deposit. Our third structural sequence, K3, was cut into 1616 and consisted of 43 postholes concentrated in the northern half of the trench (Fig. 56). Unlike the earlier structural phases of K, the structures of this phase were very clear and appeared to form a single complex (Fig. 57). The core of this complex was formed by a circular structure of postholes (1622, 1624, 1626, 1638, 1640, 1642, 1644, 1686, 1690, 1692, 1696, 1698, 1700, 1702 and 1704). Although half of the structure was under the northern section, it has been estimated that its diameter was close to 2.5 m. A line of three postholes (1646, 1648 and 1706) appeared to run 0.75 m south from the circular structure and form the eastern edge of a 0.75 m wide entrance-way. The western edge was formed by two postholes (1650 and 1652) which appeared to be connected with a 3 m long east–west alignment of six postholes (1654, 1656, 1678, 1680, 1708 and 1712), perhaps representing a fence. Three other smaller clusters of postholes in the northern quadrants marked the location of other structures whose function is not as yet obvious. The 3.25 m long north–northwest alignment of postholes (1666, 1676, 1682, 1682 and 1684) may represent a further fence or shelter alignment, perhaps even sheltering the structure represented by postholes 1660, 1664, 1668, 1670, 1672 and 1674. The third cluster consisted of a pair of large postholes (1630 and 1634) and a pair of small postholes (1632 and 1694) flanked by a large posthole (1628 and 1636) on either side. The function of this pattern is unclear, but it should be noted that a similar pattern was identified in structural phase J2. It appears that well 1279 was cut 0.50 m into the surface of 1616, through 1714 and 1811, and into the underlying gravel 1887. The cut then appears to have been lined with two rough courses of smaller gneiss boulders and stones to prevent the sides from slumping (Fig. 58). The clay 1616 was overlain by a 0.05–0.07 m thick clay deposit (1615 and 1617) on the eastern side of the gneiss outcrop during stratigraphic phase X. Although it is not clear what formation processes were responsible, it is possible that it was more or less contemporary with the structures of K3, prior to the sealing of both 1615, 1616 and 1617 by layer 1496. It is unclear what function the three postholes (1658, 1662 and 1670) cut during stratigraphic phase XI into 1615 and 1617 may have had (Fig. 59). Unfortunately no structural analogies are available for this period from within Sri Lanka or peninsular India.

5.3 Structural period J

Structural period J is differentiated from K because of the obvious increase in the diameter and depth of structural timbers, as reflected in the postholes, and secondly, because major structural activities shift from the northeast corner of the trench to the northwest corner. Stratigraphic phase XI was sealed by 1496, a 0.01–0.14 m thick layer of sandy and silty clay during stratigraphic phase XII. A steady decline in the humus content throughout J, in combination with an increase in finds of burnt fragments of wattle and daub, suggests that the layers now sealing structural phases may represent melt from wattle and daub walls rather than natural depositions.

Structural phase J1 consists of 59 postholes cut during stratigraphic phase XIII into 1496 (Fig. 60). J1's postholes appear to be divisible into two separate groups, those in the northwest of the trench and those in the south. The southern group consisting of 15 postholes appears to form one or two possible alignments. These alignments comprise two possible fences, the straight, 4.5 m long alignment of 1589, 1591, 1593 and 1599, and the 4 m long arc of 1583, 1585, 1587 and 1589. The northwestern group consists of a rough circle of 44 postholes with a diameter of 4–6 m. It is highly probable that this circular concentration represents a round timber structure with a series of ancillary posted structures or alignments.

The structural activities of J1 were sealed by layer 1407 during stratigraphic phase XIV. In turn 1407, a deposit 0.01–0.67 m thick, was cut into by various activities during stratigraphic phase XV. These associated activities form structural phase J2. They are much clearer than those of J1 and suggest permanent buildings (Fig. 61). A circular structure of ten postholes (1405, 1408, 1410, 1412, 1414, 1416, 1424, 1428, 1477 and 1479) with a 5 m diameter was identified in the northwestern quadrant (Pl. Vb). Although at least half of the structure was under the western section, the presence of postholes 1418, 1420 and 1423 suggests that there may have been internal divisions within the structure. A number of other structural activities were identified to the east of the circular structure. An ancillary structure of nine postholes (1416, 1430, 1432, 1434, 1436, 1438, 1440, 1442 and 1444) arranged in a symmetrical pattern was highly reminiscent of that of K3. A further structure, consisting of a large central posthole (1462) balanced by a smaller posthole on either side (1460 and 1464), appeared to be centred on a possible 5 m long arc consisting of postholes 1452, 1454, 1456, 1458, 1466, 1468 and 1470. Three small and one large pit were cut in the eastern side of the trench. Pit 1472 measured 3.75 x 3.62 m and was 0.40 m deep; pit 1484 had a diameter of 1.5 m and was 0.26 m deep; pit 1486 had a diameter of 0.80 m and was 0.35 m deep; pit 1490 measured 0.7 m by over 0.8 m and was 0.37 m deep.

Structural phase J2 was sealed by layer 1293, a sandy clay 0.01–0.20 m thick, during stratigraphic phase XVI. J3 allows us to identify one or two stratigraphic sub-phases, namely postholes 1339 and 1349 cutting pit fill 1372, posthole 1400 cutting pit fill 1391, and posthole 1359 cutting pit fill 1403. However, this does not really help us to distinguish the phasing of all 46 postholes, three pits and one furnace or oven (Fig. 62). Although the concentration of 16 postholes in the extreme northwest quadrant seems to have an indistinguishable pattern, it is probable, when one considers the pattern of J4, that it represents a further structure. A trough-like pit (1341) appears to represent a furnace or oven and is very similar to others found in structural phases J and I. A circular pit, 1371, with a diameter of 1.25 m and a depth of 0.52 m, was cut close to furnace or oven 1341. It contained numerous sherds in its basal sandy clay fill (1483), however the major fills (1382 and 1404) contained one iron arrowhead (sf 10679), one badly corroded copper alloy wire (sf 10673), one polished stone rubber (sf 10680), one clay disc (sf 10671), three Black-and-Red Ware cups with holes bored through their bases (sf 10675, 10676 and 10677), and two complete ceramic vessels (sf 10678 and 10681), one of which bore graffiti markings (Fig. 63, Pl. IVa) and was sealed with a 0.20 m thick layer of red gravel (1372). The fill 1382 was cut by a small pit (1339) which was filled with silty sand (1340) and by posthole 1349. In the extreme southeast of the trench, well 1271, first cut during stratigraphic phase XVIII, was still in use and appears to have been fenced by at least six posts (1373, 1375, 1377, 1379, 1386 and 1389). In the southwest of the trench a circular enclosure with a diameter of 2 m was created by seven postholes (1343, 1345, 1347, 1351, 1355, 1357 and 1397). In addition, it is tempting to utilize postholes in order to form possible alignments, for example, 1329, 1331, 1333, 1335 and 1337.

In contrast to the activities of stratigraphic phase XVI, the activities of XVIII are far clearer. Following the sealing of J3 by layer 1175 during stratigraphic phase XVII, a total of 34 postholes, two pits, one furnace or oven and one well were cut, forming structural phase J4 (Fig. 64). Sub-phases are indicated by the cutting of posthole fill 1296 by postholes 1275 and 1277, and by the cutting of posthole 1225 into pit fill 1216. Of these activities, a structure in the northwest corner of the trench is most complete. This structure consists of a segment of a circular or round structure with a diameter of over 3 m (Fig. 65). Its centre is indicated by four major posts (1229, 1245, 1247 and 1249), probably central supports, while its circumference is formed by fourteen postholes (1233, 1243, 1257, 1259, 1261, 1265, 1267, 1269, 1271, 1273, 1275, 1277, 1283 and 1295). Internal divisions are suggested by postholes 1237, 1239, 1241, 1255, 1263, 1279, 1281, 1285 and 1287. A furnace or oven (1235) was located in a very similar position to that of stratigraphic phase XVI (Fig. 66). Its basal fill, 1291, consisted entirely of charcoal. The 2 m diameter circular enclosure of J3 was replaced by a pit (1215) with a diameter of 1.5 m and a depth of 0.55 m. Whilst the purpose of pit 1215 is unclear, it is clear that well 1279 was re-cut and walled, and presumably de-silted.

Layer 1175 was then partially sealed by layer 1174 in the northern portion of the trench during stratigraphic phase XX, and partially by 1172 in the southern portion during stratigraphic phase XXII. As 1172 and 1174 do not overlie or inter-cut, their relative stratigraphic position is unclear; however, all other parts of 1175 remained exposed until 1125 sealed all three in stratigraphic phase XXIII. Layer 1174, a 0.10–0.17 m thick sandy clay, was cut by fourteen postholes and three pits (Fig. 67). The cutting of pit fill 1195 by postholes 1192 and 1211 suggests a small degree of sub-phasing. The postholes form an indistinct pattern of an open space, measuring 1.5 m by over 0.75 m, surrounded by postholes 1176, 1178, 1180, 1182, 1186, 1188, 1192, 1196, 1198, 1200 and 1211. Pit 1190 measured 1.25 x 1 m and was 0.27 m deep; pit 1194 had a diameter of 1.5 m and a depth of 0.045 m; and pit 1207 measured 1.10 x 1.5 m and was 0.395 m deep. Layer 1172, sand 0.06–0.29 m thick, was deposited in the southern half of the trench (Fig. 68). It is thought to represent either a fluvial deposit or possibly a man-made path of sand.

Structural analogies between Brahmagiri and ASW2 might be expected, as both represent Iron Age settlements in the latter half of the first millennium BC. However, although postholes are mentioned in the Brahmagiri report, no plan or description of structural shapes is given (Wheeler 1948: 204). Indeed, there appears to have been a preoccupation with the excavation of Iron Age 'megalithic' burials, common to both Sri Lanka and the mainland, rather than the investigation of habitation sites. As a result no structural analogies are available for this phase.

5.4 Structural period I

The third occupational period at ASW2 represented a watershed in terms of structural sequence. The round or circular structures of periods J and K were replaced by square or rectangular structures, although it should be noted that ASW2 offers only a small sample and we cannot make such suggestions for the entire site. A further change is reorganization of the distribution of structures and activities within the compound. The loci of activities appear to have shifted from the northern half of the trench to the southern half. Old land surface 1175 and its partial sealing layers, 1174 and 1172, were in turn sealed by layer 1125, a sandy clay, during stratigraphic phase XXIII. The humus-free nature of this layer 0.062–0.28 m thick, combined with the presence of a limited number of wattle and daub fragments within it, suggests that it probably represents the levelling of structures from J5. During stratigraphic phase XXIV a total of 23 features were cut into its surface (Fig. 69). Although the functions of most of these features that make up structural phase I1 are clear, for example rubbish pits or ovens or furnaces, their interrelationships are not. The most obvious linked features are the pits, slot and postholes making up the southern rectangular structure, partially exposed, the balance being under the southern section (Pl. VIb). Although only 5.7 square metres of the structure were exposed, the form was clear. The northern wall, measuring 3.25 m, was formed by two large post pits (1128 and 1130) with diameters of over 0.40 m at either end. The alignment was completed by the presence of four smaller postholes (1156, 1158, 1160 and 1162) with diameters of less than 0.13 m. The exposed 1.75 m long length of the eastern wall was at 90° to the northern wall and was defined by an alignment of four small postholes (1136, 1138, 1140 and 1154) running due south from corner post pit 1128. The structure's western wall also ran at 90° to the northern wall and consisted of a 0.80 m long and 0.22 m deep slot (1122) located 0.65 m due south of post pit 1130. A clear, 0.02 m thick, dark organic line (1171) also ran for 1.5 m of this alignment, confirming the presence of organic walling material. On the eastern edge of the structure a small, 0.08 m thick deposit of clay was identified, although it may represent either a dump or an activity area. A small scatter of eroded tile fragments (1093) was located 0.60 m to the west of oven or furnace 1152 and 0.65 m to the south of pit 1165; however, it is unclear what this scatter represents. Sub-phases within the structural period are indicated by a single posthole (1150) cutting into context 1149, the fill of oven or furnace feature 1148 (Fig. 70). It might be tempting to suggest that oven or furnace 1148 had been levelled and filled following its replacement by oven or furnace 1152, but such a link cannot be supported.

The activities of stratigraphic phase XXIV were partially sealed in the southeast quadrant by layer 1124, a 0.072 m thick clay sand, during phase XXV. Although it sealed posthole 1169 and clay 1164, it is unclear whether it was deposited while I1 was still in occupation or whether it represents part of the levelling process in order to prepare the area for the features of I2. Layer 1124 and the remainder of old land surface 1125 were then both sealed by layer 1101 during stratigraphic phase XXVI. Again, as in the case of 1125, it appears that the 0.03–0.185 m thick clay deposit is the product of a major levelling in the area of the trench. In contrast to structural phase I1, the overall layout and relationship of linked features of phase I2 are very indistinct (Fig. 71). Features consist of five pits (1099, 1102, 1114, 1116 and 1142), one small posthole (1104), one shallow gully, 1.60 m long and orientated north–south, and an oven furnace (1109 and 1111). Pit 1116 may represent the eroded stump of a north–south orientated slot which had at one time linked up with slot 1107, also on the same alignment. If such a supposition were possible, it would form an eastern edge in an identical position to those of earlier and later structures (I1, I4, I6, I7 and I8). However, if the structural definition may be fragmentary as a result of erosion, I2 possesses the best preserved oven or furnace structure, allowing us to actually reconstruct its main features (Fig. 72). A circular pit (1109) with a diameter of 0.50 m had been cut to a depth of 0.23 m into old land surface 1101. A second pit (1111) measuring 0.75 m long and 0.45 m wide, oval in shape and orientated north–south, was cut into 1101 abutting 1109. The base of 1111 sloped down towards 1109, being 0.23 m deep at its northern end and only 0.12 cm deep at its southern end. Pit 1109 and 1111 had then been linked by the excavation of a 0.25 m wide tunnel from the northern edge of the latter to the southern edge of the former. Carbonized sticks and twigs were found within all the lower sections of both units (1113 and 1120), including carbonized branches stretching from 1111 into 1109 (Pl. VIIa). From the morphology of the two pits it seems likely that 1109 represents the furnace proper and 1111 the stokehole. This example, being the best preserved, allows us to assume that all the other furnace or oven features were also constructed in this manner but that, during their levelling, the bridge over the interconnecting tunnel, being the weakest point, had collapsed. The features cut during structural phase XXVII were then sealed during phase XXVIII by layer 977, a 0.02–0.143 m thick mixture of silt, sand and clay. The number of features cut into 977 during stratigraphic phase XXIX and structural phase I3 is very disappointing – just two! These two features are an oven or furnace (1096) measuring 1.25 m long, 0.50 m wide and 0.24 m deep, and an irregular-shaped, 0.50 m deep pit (1118) measuring 1.75 x 1.00 m (Fig. 73).

Pit 1118, oven or furnace 1096 and old land surface 977 were then sealed by sandy clay 961 during stratigraphic phase XXX. It was into this 0.02–0.09 m thick deposit that during the fourth structural phase, I4, and stratigraphic phase XXXI an 87-post structure was constructed covering some 40 square metres of the trench (Figs 74, 75). The building preserved in its core the same formation as that of the rectangular building in structural phase I1. The fact that this pattern was repeated, despite the presence of at least one, almost empty, levelling phase in stratigraphic phase XXVIII, suggests that the phases were quite close together in terms of chronology. Whereas I1's northern wall had been defined by a 3.25 m long alignment of six postholes and pit holes, I4's consisted of a 3.45 m alignment of seventeen postholes (917, 919, 959, 990, 998, 1000, 1002, 1006, 1008, 1010, 1022, 1024, 1026, 1028, 1030, 1058 and 1064). The levelled wattle and daub stump of this wall was numbered 915. The western wall of I1 had consisted of an alignment of one post pit and a slot; in I4 this was replaced by a 1.70 m long alignment of eight postholes (917, 931, 933, 935, 959, 1004, 1032 and 1044) within a wattle and daub wall (959). While I1's eastern wall had only been 1.75 m long, with an alignment of five postholes and pits, this length was extended to an alignment of 23 postholes (919, 937, 939, 941, 943, 945, 947, 949, 951, 953, 955, 958, 967, 990, 992, 994, 996, 1012, 1056, 1058, 1060, 1083 and 1088) forming the core of wattle and daub wall 912 with a length of almost 5.00 m. A fresh north–south wattle and daub wall (963) was constructed 1.75 m to the west of wall 959. It was marked by nine postholes (927, 1040, 1042, 1044, 1046, 1048, 1050, 1052 and 1080) and measured some 4.5 m in length. The northern ends of walls 963 and 912 were joined by a 5.12 m long alignment of ten postholes (951, 953, 955, 957, 966, 1014, 1056, 1072, 1074 and 1078) cut into old surface 961, and five postholes cut into post slot 906. The presence of postholes 1034 and 1036 indicates that there is a possibility that this east–west alignment continued further to the west of slot 906 and under the western section. Three postholes (1016, 1018 and 1054) may mark a buttress-type construction extending almost 1.00 m south of the northern wall. Another probable alignment is of four postholes (982, 984, 986 and 1062) running east from wall 912 close to the southern section. It is possible that they represent a temporary or light-weight screen.

While the structure of I4 is defined by the stumps of wattle and daub walls formed on a stake and post alignment, the structure's clay floors were also preserved (972, 973, 974, 975 and 976) (Fig. 76). Three of the floors – 972, 973 and 974 – are cut by pits. Although in the case of 1044 and 969 such pits may indicate refuse dumps, could pits 908 and 910, being less than 0.09 m deep, represent the location of a movable or perishable object? The distribution of these five clay floors suggests that the structure consisted of at least five rooms or divisions, perhaps six if we take into account the partition marked by postholes 982, 984, 986 and 1062. The presence of a further structure is indicated by clay floor 903 at the extreme northwest corner of the trench. It is interesting to note that, although we found no traces of slots or postholes in this area, 903 in combination with the tile collapse above (894) must confirm that there was a substantial structure here. Both structures were destroyed by fire, indeed it appears that the tile roof (894) over floor 903 collapsed *in situ*. Similarly the tile roof over floors 972, 974 and 975 had collapsed *in situ*, preserving the individual orientation of many of the tiles, together with carbonized elements of the timber superstructure, fired wattle and daub, and tile nails (Figs 77, 78).

The tile collapse and rubble, representing the destruction of the building by fire during stratigraphic phase XXXII, was then sealed by a general stratigraphic levelling, phase XXXIII. During this phase a 0.065–0.22 m thick clayey sand (880) was deposited, and within its matrix were numerous tile, wattle and daub fragments. Structural activity within this phase was restricted to a single posthole (900) cut in the southwest quadrant during stratigraphic phase XXXIV (Fig. 79). This phase was then sealed by a 0.02–0.17 m thick clayey sand (837) during stratigraphic phase XXXV into which were cut eleven features (Fig. 80). These features represent activities during structural phase I6, as did the laying down of foundation 834 and its various cut features. Although we have represented within this structural phase at least five stratigraphic phases (XXXVI, XXXVII, XXXVIII, XXXIX and XL), it is highly probable that they were all more or less contemporary. It is also extremely interesting to note that the form of the structure is very similar to that of the other period I structures, suggesting that rebuilding had occurred shortly after the destruction of I4 (Fig. 81). The main structure was located in the southern half of the trench and consisted of slots and postholes cut into a 0.265 m thick foundation of sandy clay (834). Phase I1's cell was replicated by a 1.35 m long north–south post slot (851) on the northern side, by a 2.00 m long post slot (883) on the western side, and by a 2.35 m long post slot (892) on the eastern edge. A further four postholes (855, 863, 888 and 890) were also cut into 834 during stratigraphic phase XXXVIII, in addition to a pit (869) with a diameter of 0.50 m containing a complete ceramic vessel (879) (Fig. 82). The purpose of this vessel is unclear, however the fact that access to it was kept clear in the succeeding structural period, I7, suggests that it was of importance. A 0.01–0.11 m thick expanse of clay and possibly dung (831) was identified running along the eastern edge of the building, seemingly defined on its western edge by 2.75 m long slot 898 and 1.15 m long slot 886. Although possibly a floor, the origin or depositional function of this material deposited during stratigraphic phase XXXIX is uncertain; however a single posthole (872) was cut into it, and further deposits of a similar nature (850) were accumulated during stratigraphic phase XL (Fig. 83). Other compound features consist of two ovens or furnaces (857 and 861), six postholes (835, 853, 865, 867, 874 and 876), a square clay-lined pit (859) and a well (896). The latter feature with a diameter of 1.30 m was cut down through the underlying levels and into gravel 1886 below. The well also appears to have been filled with contexts 1106, 1121, 1206, 1383, 1394 and 1399 during this period, as indicated by posthole 874 cut into its final fill (897).

The structural features of I6 were then sealed by four contemporary deposits - 752, 787, 790 and 796 - into which the structural features of I7 were cut (Fig. 84). Layer 752, a 0.02–0.08 m thick clay, was laid as a foundation over 834 during stratigraphic phase XLI. Layer 790, a 0.165–0.195 m thick sandy clay, appears to have been a northern extension to this foundation or platform, being deposited during contemporary stratigraphic phase XLVII. While 752 and 790 appear to have been a conscious construction, layers 796 to their west and 787 to their east seem to be the results of levelling in order to raise the level of the areas surrounding the central platform or foundation. The structural complexes of I7 are clearly derived in form from earlier phases of I. I1's inner cell at the southern edge of the trench is repeated again with I4's additional corridor or verandah to the west, additional cell to the north and partitioned area to its east. Structural phase I7, however, also expands the pattern by extending the northern boundaries of the structure towards and under the northern section, allowing us a very clear idea of the internal divisions of part of the building. The northern edge of I1 was defined by a 1.50 m long and 0.20 m wide slot (803), its eastern edge was defined by a 1.70 m long and 0.40 m wide slot (800), and its western edge by a 2.05 m long and 0.35 m wide slot (801). The fill (802) of slot 801 contained a plastered edge (809) on its western exterior. The southern cell thus defined had three postholes (773, 763 and 785) in an apparently semicircular pattern surrounding pit 770. As the latter was only 0.125 m deep, it seems unlikely that it represents a refuse pit. More probably, like pits 908 and 910, it represents the foundation for a movable object or structure. A further structural detail in this cell was the presence of a rounded corner foundation of tile fragments set in clay. I4's western extension was replicated by feature 807, a 1.50 m long and 0.55 m wide slot, and its eastern extension by 832, a 1.20 m long and 0.325 m wide slot. An additional slot, 842, runs the entire length of both 800 and 832 – perhaps acting as a foundation for additional timber supports? The ceramic vessel 871 sunk into 834 during structural phase I6 was still accessible in the northern cell through a hole in the floor. Whilst its northern edge is marked by slot 840, the western edge of 752 is badly eroded, preventing us from identifying any structural details.

As mentioned above, foundation 752 abuts foundation 790 to its north. The latter, deposited during stratigraphic sequence XLVII, appears to be contemporary with wall footings 810 and 749, deposited during stratigraphic phases XLIX and LI respectively. The exposed 1.25 m length of wall 810 marks the western edge of 790 and is on the same alignment as the edge of 752. Its identification as a wall foundation is confirmed by the presence of post slots and holes cut into it (813, 815, 817, 819 and 821). Foundation 790's eastern edge is marked by the exposed 0.95 m length of wall foundation 749, also cut into by post slots 823 and 825. Wall foundation 749's alignment is on the same north–south axis as that of slot 842. Much of 790 appears to have been covered by clay floor 791. Two features were identified within the northern cell or area defined by walls 810 and 749. Feature 769 is clearly a clay fireplace, and circular pit 792 is likely to be the shallow foundation for a connected activity. Whilst evidence for activities on 796 is limited to the presence of a single posthole (797), 787 is cut by eleven features. The eastern edge of slot 842 is further defined by the presence of an alignment of five postholes, slots and pits (827, 838, 844, 848 and 765). That at least one of these cuts fills 843 suggests that the two features were more or less contemporary. Although the purposes of postholes 777, 779, 781 794 and 829 are unclear, tile foundation 775 and postholes 765 and 783 are clearly forming a partition wall. This latter feature can be interpreted as a replication of the wall formed by postholes 982, 984, 986 and 1062 in structural phase I4.

The features cut into 749, 752, 790, 796 and 810 were then sealed by layer 729, and those cut into 787 were sealed by 767. The features cut into 729 and 767 represent the final phase of structural activity within structural period I (Fig. 85). Unfortunately much of this structural phase has been badly eroded, forcing us to compare its form with that of better preserved phases of period I. Layer 729, a 0.15–0.335 m thick clayey sand, appears to have been laid during stratigraphic phase LIII as a foundation in much the same way that 752 had been; accordingly, the majority of I8's features are cut into it. The building's fragmentary outline appears to be very similar to that of I7. Its western edge is partially marked by the 2.85 m long slot 737, whilst its eastern edge is marked by the 5.25 m long slot 706. The latter slot is clearly replicating I7's slot 842 but has what might be a return in brick (902). Owing to differential erosion the only obvious postholes were found in the southwest corner. Postholes 748, 755 and 757 appear to mark the location of structural supports to accompany foundation slot 737. The only feature in the northern half of the trench is fireplace 769, which appears to have been built up in order still to be functional. Four vestiges of a badly eroded clay were found (750, 753, 754 and 771), confirming the similarity in floor area between this structure and that of I7. While the southeastern corner of 729 was cut by a large pit (751), the only surviving evidence of human activity on 767 (a layer 0.13–0.175 m thick) was in the form of two shallow postholes (759 and 761) which may even be root holes.

Unfortunately, there are no structural analogies available for this period in peninsular India and Sri Lanka, apart from the reported postholes in trenches D and H at Mantai (Prickett-Fernando 1990: 117).

5.5 Structural period H

The fourth occupational period at ASW2 represents an anomaly in comparison with other periods. The features of H1 and H2 are, for the main, shallow, linear pits or troughs with semicircular ends. They range in length between 2 m and 2.30 m, and in width between 0.30 m and 0.40 m. All are orientated east-west and are clustered in the northwest corner and the northeast corner. They were all cut into old land surfaces and filled with wood. The wood was burnt, leaving carbonized logs at the base; analysis of this carbonized material has identified a variety of hardwoods, softwoods, mangrove species and fibrous material, perhaps palm fibre (see Volume II, Chapter 12: Botanical Remains). The heat was so intense that the 0.02–0.01 m of soil immediately surrounding the features was oxidized, while the soil between 0.01 and 0.005 m from the edge was reduced. The homogeneous fill overlying the basal charcoal suggests that the pits were filled almost immediately. In view of their short exposure they have a high concentration of special finds, higher than those of multi-phase rubbish pits, wells and furnaces (Figs 86, 87). As a result there has been some difficulty in interpreting these features. It is possible that they may represent a cremation ground, because they are orientated to the auspicious east, while furnaces from preceding periods had no fixed orientation. As, however, there were no finds of human skeletal remains in their fills (see Volume II, Chapter 11: Human Remains), it is more likely that the troughs represent a craft-working locality as in the case of similar features at Ujjain (*IAR* 1958: 34). Old land surface 767 and structural phase 729 were then levelled and covered with old land surface 744 during stratigraphic phase LXII. Context 744 was a 0.26–0.105 m thick silty clay, into which were cut 12 features (Fig. 88). While the burning troughs 731, 736, 738, 739 and 740 all appear to be typical of the features described above, burnt pits 734 and 881 seem to be more similar to the ovens or furnaces of structural phases J and I. It is evident that not all the trough features were cut at the same time. Trough 738 cuts trough 739, and trough 731 is cut by oven or furnace 881. The five features cut into the southern half of the trench during stratigraphic phase LXIII (702, 704, 708, 710 and 712) appear to be large postholes marking a 7 m right angle of a fence or shelter. Old land surface 744 was then covered with 670, a 0.304–0.102 m thick sandy clay, during stratigraphic phase LXIV. The eight features of 744 make up structural phase H2 (Fig. 89). Features 732, 733 and 735 all conform to the typical period H burning troughs, while postholes 691, 699 and 741 actually cut their fills. Postholes 687 and 689 may or may not be contemporary with either group of features.

5.6 Structural period G

Period G saw another shift in structural loci with buildings constructed in the northern and southeastern areas of the trench. The first phase, G1, was not well preserved, having been disturbed in later phases (Fig. 90). The structure was defined by a 0.14–0.08 m thick clay platform (663) measuring over 5 x 3 m. This eroded platform, laid during structural phase LXVI, was cut by two square postholes (676 and 680), five round postholes (665, 672, 674, 682 and 684) and a single foundation pit (695), 0.172 m deep. The fragmentary nature of the platform and the incomplete posthole alignments make it impossible to interpret or link the features.

The features of phase G1 were then levelled and covered by phase G2 with the construction of a building with clay platform (615) in the northern quadrants (Fig. 91). Much of the building was under the northern section wall, but the western edge was defined by a 2 m long rubble-filled slot (637) and posthole (654). A section of the southern edge was defined by two postholes (620 and 622), a 2.65 m long gravel foundation (656) and a further building platform (616) in the southeast quadrant. The structure's eastern edge may be indicated by gravel wall 614 which was exposed in the trench's eastern section. Protruding from the northern section were two square foundation pits, measuring almost 2 metres square, cut into the floor, one at the extreme western edge of the building (669) and the other 5 m to its east (612). They both contained fills of limestone slabs, sand and pebbles. It is probable that they represented foundations for timber roof supports and as such they provide an interesting prototype for the stone pillar foundations of structural period F. Other features included a shallow pit (636) and eight postholes (611, 626, 641, 644, 646, 647, 650 and 652). The building in the southwest quadrant, partly under the east section, had a clay platform (616) with an area of at least 10 square metres. Its western edge was defined by a 2.5 m length of gravel foundation (608), aligned north-south, some 2 m from the eastern section. The northern edge was defined by the southern extent of building platform 615 in the northern quadrants and by gravel foundation 603 at its northern extreme. A foundation pit (596, possibly 503) for a roof support abutted the inside of the western wall, 3.5 m south of the northern edge of the structure. Platform 616 was also cut by a single posthole (618) in its southern half. In the right angle formed by these two buildings a number of features were exposed. These included posthole 624, hearth (?) 660, pits 612, 628, 667 and 638 (possibly a further roof support), and slot 662. Most of the latter features were sealed by tile dump 658 during stratigraphic phase LXXIV.

The structures on the clay platform of phase G2's northeast quadrant were then levelled to provide a foundation for a surface of gravel during stratigraphic phase LXXV. The structures of phase G3 followed very carefully the pattern and layout of those of phase G2, although the former is incomplete (Fig. 92). Clay platform 615 appears to have been replaced by a pavement of limestone slabs, of which three small patches remain (613). One such patch of 0.75 square metres consisted of eight limestone slabs and one patterned gneiss quernstone (sf 10186), apparently placed directly above a small pit (633) (Pl. VIIb). The floor's eastern edge appeared to be indicated by a 2.6 m long and 1.1 m wide gravel foundation (503) running north–south. Clay platform 616 was replaced by clay platform 492, which in turn was delineated by 3.3 m long gravel foundation 491 and by 1.32 m long, clay-filled slot 516 with its two postholes, 497 and 499, running east–west. A further east–west gravel foundation (502) suggests that the range of buildings, of which 492 was one, extended further north and was subdivided into two compartments roughly measuring 3 x 2.5 m and 3 x 3 m. A further structure was identifiable in the southwest quadrant of the trench. An area of roughly 4.5 x 3 m was delineated on the west by a 4 m long gravel foundation (505 and 506), on the north by pit 518 and gravel foundation 507, and on the east by gravel foundation 504. The exposure of four limestone slabs (509), with a total area of 1 sq. m, lying on a foundation of pebbles and brick rubble within this area suggests that they may represent the remains of a further area of paving, although it is possible it is the base for a pole or pillar. An area of 8 square metres, including the fragment of paving, was covered by a heap of broken roof tiles and brickbats (498), evidently re-usable material salvaged either from this structure or a neighbouring one.

The structures of phase G3 were then sealed by old land surface 470 during stratigraphic phase LXXXI (Fig. 93). This 0.58–0.06 m thick sandy clay deposit was in turn sealed by 605, a 0.34–0.235 m thick clay-gravel mix, during stratigraphic phase LXXXIII. Layer 605 in turn become the platform for a floor of limestone slabs (408) covering an area of over 3 metres square (Pl. VIIIa). This paving appeared to duplicate the position of 613 in phase G4. Pit 598 was cut at the southeastern corner of 605, and a filled earthenware pot (597) with a diameter of 0.40 m was sunk into the floor up to its neck. The western edge of 408 was delineated by a 2.85 m long, north–south orientated wall (407) built of five to seven courses of brickwork. Beyond the western edge of the wall, parallel to 406, an area of stone and brickbat paving was exposed (488), running a length of 2.25 m. Phase G3's wall 491 appeared to be duplicated in G4 with a 6 m long, north–south alignment linking postholes 474, 479, 481 and 485; cross wall 516 was duplicated with the 1.5 m long east–west alignment linking postholes 481 and 483. Thus the eastern half of the trench appeared to be divided into two similar compartments, as in G3 but of less permanent construction.

The most recent phase of G5 began with the levelling and rebuilding of the compound during stratigraphic phases LXXXVI and LXXXVIII (Fig. 94). Limestone paving 408 was covered with 0.605–0.325 m of rubble, gravel and soil (419, 426 and 409) and capped with brick paving 405. The latter (405) covered an area of almost 4 m east–west by 6 m north–south. Three pots (381, 382 and 383) with diameters of over 0.70 m were partially sunk into the new paving, just above the pot of G4 (Pl. VIIIb). Stretches of western brick wall (407) were rebuilt on foundations of gravel (446); those parts of the wall not repaired slumped 0.30–0.80 m to the west because of subsidence. Wall foundations 445 and 450 suggest that this alignment continued for the entire 10 m width of the trench. Beyond the western edge of wall 446/407 an alleyway (450), 0.50 m wide and over 6 m long, paved with stone and rubble, was laid running from north to south with a gradient of 1:25 (Fig. 95). The alley's western limits were marked by a series - on wall foundations orientated north–south and east–west - of red gravel (447, 448, 449, 458 and 459), possibly indicating a further compound. The area to the south and east of these repaired structures was also levelled with 0.195–0.85 m of soil (390) during stratigraphic phase LXXXVI. On the new land surface, two 10 m long parallel walls aligned north–south (442, 444, 471, 453 and 456; 437 and 428) were constructed 1.5 m apart. Three east–west walls (339, 437 and 455) divided the range into a number of compartments roughly measuring 1.5 x 1.5 m (partially excavated), 1.5 x 1.5 m, 4 x 1.5 m and 1 x 1.5 m (partially excavated). The walls were all built around a framework of stakes (341, 434, 436, 439, 460, 462, 464, 466, 4717, 472, 477, 522, 524 and 526), smeared with a mixture of mud-mortar, red gravel and wattle and daub, and then coated with a lime-rich whitewash (412) (Pl. IXa). The building was positioned on the same alignment as the eastern ranges of phases G3 and G4 and covered with a roof of kiln-fired tiles. A single feature, 443, was identified in the area between walls 445 and 442. It was 1.05 m square, 14.5 m deep and filled with gravel, but its function is still unclear. The latest phase ended with the destruction of the compound by fire and the collapse of its walls during stratigraphic phase XCI. As the monumental pillared hall of the Anuradhapura period was erected directly on the levelled structures of structural phase G5, this, in effect, sealed the phases below, preventing contamination.

When we are looking for analogies with this sequence of structures, Arikamedu is one of the clear parallels in terms of date and shared pottery forms – Rouletted ware and Arikamedu Type 10, for example (see Volume II, Chapter 6: Unglazed Ceramics). It is, however, extremely difficult to make analogies owing to the size of ASW2's trench (100 square metres) and to the monumental, commercial nature of the Arikamedu warehouse structures (Wheeler 1946). Unfortunately there have been no discoveries of habitation localities at Arikamedu.

Phase G also sheds some light on the introduction and development of one of the most obvious features of Anuradhapura-period architecture – the use of the gneiss or granite pillar. Indeed, the sacred city is littered with thousands of such core structural elements, now freed from more perishable superstructures (Bandaranayake 1974). As illustrated below, the framework of the monumental structure of period F, its pillars, were mostly sunk to depths of almost 2 m below the floor level. They had been set on a saddlestone or spurstone which prevented the pillar from being driven further into the soil when the superstructure of timbers, tiles, and wattle and daub was added. This practice of construction has been identified by many scholars as being a later import, along with specific techniques and tools to work the locally outcropping gneiss or granite (Wijesekera 1962: 179). As noted in Chapter 2 above, we are now able to suggest that the use of pillars was not a new technology, but one which had already been developed in the late centuries BC and the early centuries AD. The levelled remains of three saddle- or spurstones were recorded in structural phases G2 and G3. Three square pits in phase G2 (669, 612 and 596) contained limestone slabs laid on a pebble and sand foundation, while a square pit in phase G3 (517) was similarly filled (Fig.96). These pits, ranging in size between 1 and 2 metres square and between 0.20 and 0.305 metres in depth, are clearly foundation pits for wooden pillars which were later moved prior to levelling, or which rotted away. These prototypes pre-date the earliest dated Sri Lankan stone examples by a number of centuries. This confirms Bandaranayake's hypothesis that stone pillars represent 'only a late and often unnecessary replacement of an originally timber feature' (Bandaranayake 1974: 13). Perhaps this evidence also goes towards building what Bandaranayake has termed 'the concept of a Sinhalese tradition' (ibid.: 8) and gives further support to his statement that 'the primary source of Sinhalese architectural development was the indigenous building tradition' (ibid.: 11).

5.7 Structural period F

Structural period F is represented by the pillared hall, referred to above, which had comprised at least five rows of five columns of ashlar pillars, possibly more under the balks of the trench (Pl. IXb). Owing to the robbing activities of stratigraphic phase XCV, only 14 pillar supports were excavated (264, 304, 305, 306, 345, 355, 358, 362/3, 369, 370, 374, 378, 379 and 421). Each pillar was 4.6 m long, 0.25 m wide and 0.20 m thick. The portion exposed above the brickbat pavement was dressed, and in one case plastered with a lime mortar coat (306), while the portion below the floor was very roughly prepared and bulbous in shape. The building was oriented on the cardinal axis.

The sequence of building is now evident and was as follows. The outline of the structure was delineated and boundary walls were constructed. The structure's western wall (536) is preserved in the trench's western section and varies in depth between two and seven courses of brickbats, depending upon the undulating old land surface. The dubious stability in the extreme southwest corner of the trench merited a small buttress along the inside edge of the boundary wall (537). The individual pillar foundations vary in minor details, dictated by the surface below (Fig. 97). Shallow pits were cut in most cases into the underlying deposits, and a few alternate courses of brick, mud-mortar and cleaned sand were laid. Ashlar saddlestones, single slabs incised with one line running north–south and another east–west, were laid on this foundation (Fig. 98). The lines can be interpreted in a number of ways. They may represent the mason's building lines for laying out the hall's plan, using a gnomon or line to sight along the grooves. They may also represent intentional lines of weakness, so that when the roof was added the additional carrying weight on the pillars split the saddlestones into four slabs, thus wedging the pillar against further movement. Pillar 306, for example, had actually split in this way. Of course the lines may represent aspects of both (Fig. 99).

The pillar foundations lie at an average depth of 1.75 m below the level of the hall's paving (85 and 185), thus much packing soil and rubble (364) was brought in in stratigraphic phase XCII to prepare the flooring, which consisted of a double thickness of brickbats (Fig. 100). While dismantling the pillar foundations we encountered votive deposits, including 17 identifiable coins. Six major hoards were recovered: a hoard of 2300 glass beads, 21 ivory beads and two alabaster beads had been deposited on the saddlestone of pillar 370; a miniature limestone stupa and three glass bangles were incorporated in the sand packing of the saddlestone of pillar 362/3; a bronze bowl, lying against pillar 358, had been incorporated into its rubble packing (Fig. 101); an earthenware vessel containing an iron nail, a piece of molten glass, a quartz bead blank, and a green stone bead in the shape of a conch shell had been deposited on the saddlestone of pillar 304 (Fig. 102). Beads of carnelian, quartz and amethyst and chips of garnet, quartz, amethyst and sapphire were incorporated into the rubble packing of the same pillar. A similar earthenware vessel was deposited on the saddlestone of pillar 374. The pillared hall was then abandoned during stratigraphic phase XCIV and the brickbat floor became covered with thin silts and washes (74). The presence of these silts, combined with the absence of quantities of roof tiles, suggests that the roof had already been removed, leaving the structure open to the elements. Following its abandonment it became used as a quarry for later structural phases.

The pillared hall structure excavated at ASW2 represents one of the most typical forms of the classic Anuradhapura period. It consisted of load-bearing gneiss or granite pillars, presumably supporting upper floors, walls and roofs built of wood, tile, brick and mud (Bandaranayake 1974: 15). The plan of the building appears to conform with that of two monastic residential buildings, the *kuti* and its larger version, the *pasada*, which was in Bandaranayake's words 'a rectangular, walled edifice constructed on an elevated platform, with a regular series of columns ranged throughout the entire structure' (ibid.: 251). The main space thus created was a large hall, although it could be compartmentalized through the use of permanent or temporary partition walls. As to the structure's original height, we cannot add more to Bandaranayake's statement that they were 'a multi-storied structure with at least one upper floor' (ibid.: 258). The precise function of the pillared structure is unclear but may not necessarily be monastic. When Bandaranayake reinterpreted the Citadel's Daladage, or Temple of the Tooth, as the royal palace, he suggested that it would be logical to expect that the royal palace would be constructed in a form and size similar to some of the major monastic structures (ibid.: 384). Similarly, it should be logical to expect that other pillared structures within the Citadel might not represent monastic residences, but rather secular residences modelled on more minor monastic structures. Certainly the identification of the use of wooden pillars in what is presumably a secular structure in the preceding phase at ASW2 further supports such a hypothesis. Although Bandaranayake has stated that 'Royal and monastic buildings had the exclusive prerogative of the use of permanent materials such as brick and stone' (ibid.: 16), the presence of brick structures in almost every sondage, in combination with the presence of more than ten pillared structures identified during our surface survey within the Citadel, suggests that their use must have been more widespread (Coningham 1994a).

5.8 Structural periods D and E

Structural periods D and E (stratigraphic phase XCV) are represented not by buildings but rather by a series of intrusive features - robber pits - cut from above. This series of pits (274, 275, 276, 277, 282, 279, 302, 312, 313, 314, 315, 319, 321, 328, 333, 357 and 370), ranging in volume from a minimum of 1 cubic metre to a maximum of 40 cubic metres, were cut into the structures below (Fig. 103). These gradually filled with thin layers of clays and silts and in many cases were themselves cut by later pits. This suggests that the retrieval or robbery of stone and brickbats was more an intermittent phenomenon than a systematic stripping. In addition to the robber pits we also identified and excavated the contents of 535, a well or soakage pit (Fig. 104). As only the bottom 2.17 m of this feature were identifiable in the base of robber cut 313, it is impossible to reconstruct its original stratigraphic position. The cuts are interpreted as robber pits rather than a specialist form of rubbish pit, although they evidently came to function as the latter. The evidence for such an interpretation lies mainly in their form and position. They range from having straight to slightly undercut sides, and they have a flat bottom. They are all located directly against the brick and stone foundations of the pillars (Fig. 105). The pits are cut through the brickbat pavement to a depth of 1.8 m on average, a depth just below the pillar's saddlestone or base, thus making it possible to rock or topple the 4.6 m long gneiss pillars by using their own weight to bring them down. The toppled pillar could then be hauled out of the pit and broken up or transported whole to a new building site (Fig. 106). As discussed elsewhere in greater detail (Coningham 1994b), a similar practice was used by our own workmen while dismantling the surviving pillars so that we could continue to excavate deeper. The clay and silt fillings of the robber pits were excavated, thus exposing the stone pillar and brick surround. The brick, sand and mud-mortar was then removed until the weight of the stone pillar could be used to topple it over. The pillared hall's platform was some 4 m below the present land surface, so we placed two coconut tree-trunks at an angle of 45° on the side of the section wall. The square pillars were then hauled up using ropes of coir. It took 14 men an average of 15 minutes, including preparation, to haul a complete pillar (4.6 m long, 0.25 m wide and 0.2 m thick) out of the trench. It is obvious from this experiment that the cost, in terms of labour efficiency, of digging a pit in an abandoned structure and removing ashlar material would have been far smaller than that involved in quarrying, dressing and transporting ashlar from quarries. It is clear from the presence of robber pits in every sondage excavated within the Citadel that the robbing of material was of an epidemic nature. The presence of robbed material in two major late constructions within the site, the Vijayabahu palace and the phase 6 rampart (see Chapter 4 above), suggests that their construction may have been the prime cause of the widespread destruction of older buildings within the Citadel.

5.9 Structural period C

The stratigraphic position of structural period C in the sequence at ASW2 remains rather an archaeological enigma. All that remains of this second monumental structural period within the trench is a 6 m length of lime-mortared wall (263) lying within fill 42 of robber pit 275. Owing to its excellent preservation as a result of having fallen *en masse* into robber cut 275, the following notes may be made about its construction (Fig. 107).

An alignment of six ashlar blocks, each roughly measuring 1 x 0.25 x 0.25 m, was laid. It is presumed that they were laid in slots, either cut into the old land surface or prepared in brickwork, as only the top 0.20 m of the block was dressed. Lime mortar was then applied to the tops of the blocks, and courses of brick, uniformly 0.25 x 0.15 x 0.5 m, were laid above. The collapsed wall still survived to a height of 21 courses (1.3 m) at the bottom of pit 275 (Fig.108). Little can be hypothesized as to the size or layout of this structure as no *in situ* remains were recovered. While the wall may have even been moved some distance prior to its dumping, it is worth noting that the Gedige and Building A, situated to the east of trench ASW2, were also constructed of brick with lime mortar.

5.10 Structural period B

The major robber-pitting stratigraphic phase XCV thus concluded, the area of the trench was again re-occupied as a residential quarter. The best preserved structure from the succeeding structural period was in its first phase, when part of the old land surface formed by the top fills of stratigraphic phase XCV was sealed by low building platforms (Fig. 109). During stratigraphic phase XCIV a 0.05–0.125 m thick sandy clay platform (25) was constructed, covering an area 6 m long and 4.5 m wide (Fig. 110). A further sandy clay platform (82), perhaps an annex structure, measuring 3 m long and 2 m wide, was attached to the southern flank of platform 25 during stratigraphic phase XCVIX. The central building was delineated on its west by a wall slot (236) measuring 2.25 m long, 0.40 m wide and 0.20 m deep, five postholes (116, 144, 145, 167 and 231), and pillars 305 and 374. Its eastern side was defined by a similar slot (213) measuring 1.85 m long, 0.425 m wide and 0.10 m deep, postholes 148 and 235, and pillar 304. The southern edge was marked by a slot (242) 0.95 m long, 0.125 m wide and 0.29 m deep, five postholes (144, 235, 236, 239 and 240), and pillar 305. An area of brickbat fragments (48 and 57) in the structure's southeastern corner may indicate the position of a doorway. The northern edge was marked by slot 234, measuring 3 m long, 0.275 m wide and 0.07 m deep, posthole 116 and pillar 374. The latter slot was very well preserved with wall foundations *in situ* (55), comprising a 3 m length of two rough courses of re-used brickbats. The structure's roof and walls were supported on posts and probably on the tops of the two surviving standing pillars from Phase F (304 and 305), giving a possible height of 1.65 m above the floor. Although part of platform 82 is under the northern and eastern section of the trench, its eastern edge was defined by slot 236 and posthole 231, whilst its southern edge was defined by slot 238. Three postholes (231, 232 and 233), presumably part of the roof and wall supports, were also identifiable and were excavated. Platform 82 contained a 0.02–0.75 m thick ash deposit (51) which, combined with finds of fragments of portable fireplaces and burnt brick, suggests the location of a domestic fireplace. Other features consist of postholes and pits cut into the silted robber pits during stratigraphic phase XCVI. Postholes 119, 237, 241 and 244 may represent a rack or screen feature close to platform 25, while postholes 68, 102, 106, 110 and 120 may indicate a fence. Although pit 114, cut to a depth of 0.17 m, appears to have been a rubbish pit, the function of pit 243, cut to a depth of 1.24 m, is still unclear.

The succeeding phase B2 structure was badly robbed and survived only as a single wall plus habitation debris, although it appeared to replicate the earlier structure (Fig.111). Following its robbing a series of two cardinal rectangular structures, phases B3 and B4, were built in succession. Their incomplete ground plans illustrate the constant re-use of building materials. Platforms 25 and 82 were then sealed by 24 and 27, a 0.30–0.855 m thick sandy clay old land surface, during stratigraphic phase C. Only two features of structural phase B3 survived post-occupation robbing, 143 and 29 (Fig. 112). The former is a 6 m long slot running north–south across the trench. Its 0.125 m depth is filled with brickbat fragments and the base of a gneiss pillar. As it lies on the same alignment as the other features of structural period B, it is hypothesized that it is all that remains of a building. Feature 29 appears to be a 0.25 m thick dump of rubble deposited on old land surface 24 and 27 during stratigraphic phase CI. The badly destroyed remains of structural phase B2 were then levelled and covered with 0.31–0.705 m thick old land surface 14 during stratigraphic phase CII. A central area of some 7 x 6 m was then further built up with clay platform 26. This 0.11 m thick level was used as a foundation for ashlar and brickbat walls (534) and a wall slot (101). Although damaged by intrusive pit 94, it is still possible to identify the fragmentary outline of an L-shaped structure. The building, with a maximum north–south length of 7 m and an east–west length of 5 m, comprised two (eastern and western), if not three (southern) compartments. The eastern compartment measured 3.5 x 3 m, the western 2 x 3 m, and the southern compartment was at least 3.5 m long. Although the eastern edge of the building was badly robbed, the southern edge was formed by a 2.75 m length of ashlar and brickbat walling and the northern edge by 2 m of walling and a 1 m long slot (101). The western edge was formed by a 4 m length of brickbat rubble on a north–south axis with pillars 305 and 306.

Old land surface 14 was then sealed by old land surface 9 during stratigraphic phase CVI, apparently a 0.845–0.345 m thick layer of levelled material and wattle and daub melt. The penultimate structure prior to the site's abandonment, B4, was well preserved in ground plan on this old land surface (Fig. 113). It was very similar in form to its predecessor in phase B3 and consisted of a rough ashlar and brick walled rectangle (531), measuring some 4.5 m north–south and some 5 m east–west, divided into two cells. The eastern cell was roughly 4.5 x 2.25 m and the southern cell at least 4.5 x 2.75 m. Although the structure's northern wall had been almost completely robbed out, leaving only a residue of rubble in shallow hollows, the southern wall was better preserved as a 1.5 m alignment of ashlar slabs and one or two surviving courses of broken brickbats. The western, eastern and internal dividing walls were similarly preserved as alignments of re-used building materials (Fig. 114). These features, deposited during stratigraphic phase CXI, rested on 0.1–0.5 m thick clay platform 15, which had been deposited during structural phase CVII. A further structure may be included by the possible 3.5 m long right angle of brickbat walling (532) in the southeast corner of the trench. The 0.25 m thick collapse or wattle and daub layer 12 in this quadrant may also be connected with this structure. A further clay deposit (10) of uncertain function or origin was identified in the southwestern corner of the trench close to the location of robber pit 282, which was cut to a depth of almost 2.8 m in order to recover ashlar and brick debris from the pillared hall of structural period F.

Following the abandonment and robbing of B4, the site was levelled with sandy clay (5) during stratigraphic phase CXII and new structures were built. The structures built on this 0.445–0.065 m thick old land surface were in turn robbed, leaving a skeletal outline of occupation, although it appears to have followed very similar alignments to the earlier phases of period B (Fig. 115). Residues of ashlar walling appeared to suggest the 11 m long, right-angled corner of wall 533 running from pillar 304 to pillars 305 and 306. The course of this wall was confirmed by the identification of two small postholes (69 and 71) on its north–south axis. A further posthole (68) suggests that additional activities may have been present in the southwestern corner of the trench. The building was subsequently abandoned and most of its structural elements were robbed and re-used elsewhere. A structural hiatus then occurred with the deposition of up to 0.50 m of windblown and erosional wash deposits (4) during stratigraphic phase CXIV. An amount of root disturbance from a felled coconut tree was detected in the southeast corner of the trench and recorded as 17.

One of the most complete records of the later occupation of the Citadel is given in the edited report of Ayrton's excavations in the northeast of the Citadel. At this locality he successfully identified and excavated a series of partially destroyed Polonnaruva-period structures (Hocart 1924). Although clearly built of reclaimed material, they are neatly oriented north–south lining the eastern edge of a street (ibid.: 51), suggesting the presence of some form of municipal authority. Similar structures must be presumed to cover a sizeable extent of the Citadel, though they are not normally recorded when encountered, as testified by Paranavitana's comment that he dug through 'vestiges of ephemeral mud structures' without recording them (Paranavitana 1936: 3).

5.11 Structural period A

Following the abandonment of the site, recognized as erosion deposit 4, much of the trench was subject to a general levelling of soil, brickbats and general debris. Over 0.50 m of rubble and soil (3) was laid over the undulating old land surface during stratigraphic phase CXV, and 0.20 m was removed from the two exposed pillar tops (305 and 306) in order to provide a level building platform. It appears that ashlar blocks were re-used as foundations for outer walls on the eastern and western sides, while internal partition walls were built of poorly fired mudbrick (99). The floors and walls were then coated with cement (2) during stratigraphic phase CXVI. The structure appears to have consisted of at least four compartments measuring 4 x 4 m (complete), 4.40 x 3.32 m (incomplete), 3.25 x 1.90 m (complete), 3.35 x 1.75 m (complete) (Fig. 116). It is possible that the latter two compartments, on the eastern side of the building, formed a verandah. Other features included a single pit (79) cut 0.85 m into deposit 4 in the extreme southeastern corner of the trench during stratigraphic phase CXIV. When we questioned local residents, it transpired that a Buddhist nun had lived on the plot some 40 years previously. The structure collapsed and a 0.20 m thick deposit (1) of humus, mud brick-melt and rubbish formed during stratigraphic phase CXVIII (Fig. 117).

5.12 Conclusion

The above structural sequence represents something of an anomaly within Sri Lankan archaeology as it contains some of the only examples of structures not built out of imperishable materials. Typically, excavations have been oriented toward monumental structures built of stone, brick and tile, whilst buildings constructed out of perishable materials have been overlooked and in some cases even dug through without being recorded (Coningham 1994b: 73–76). This state of affairs, in combination with the lack of other published Sri Lankan habitation sites, makes it very difficult to assess the representative nature of ASW2's structural sequence and therefore of its periodized artefact catalogue. However, the question of locality continuity at the trench can be approached: that is, does the trench at ASW2 offer a continuous sequence? If it does not represent a continuous occupation, this affects the reliability of the structural sequence and periodized artefact catalogue.

It is argued here that cities are seldom completely rebuilt in phases, barring vast natural or man-made catastrophes. They follow an uneven mosaic pattern of rebuilding, depending on changes on the small scale, for example, new access to building materials or the death of an individual. The possibility of a general disturbance all over the city is very unlikely. The factor of structural and social continuity within the site is also less serious than first expected, as illustrated by the repetitive structural data from ASW2. Structural period K, the earliest occupation of the trench locality, consisted of three phases of round structures, each phase representing the rebuilding of the structure in the same position in the northeastern quadrant. Structural period J contained a further five rebuilding phases of round structures in the northwestern quadrant. Structural period I consisted of eight phases of a square building located in the two southern quadrants, while structural period H, being four phases of shallow burning troughs, represents an anomaly in comparison with those of other periods. Period G saw a shift in structural loci with buildings, still cardinally oriented, constructed in the northern and southeastern areas of the trench, and consisted of five rebuildings. Structural period F, represented by the pillared hall, ends the major continuity, having been constructed of less perishable materials. Towards the end of the sequence, during structural period B, structures of a less permanent nature are constructed on the ruins of the pillared hall and follow five rebuildings before the locality was abandoned until its re-use in the early decades of the twentieth century.

The structural continuity within periods is remarkable; even after the previous building had been levelled, many successive phases are rebuilt on exactly the same ground plan. There is also evidence to suggest that the main uninterrupted sequence of 25 phases (from structural periods K to G) covering almost 600 years may have been occupied by a single group. This evidence is suggested by 'megalithic' symbols, or rather non-scriptural graffiti, recovered from trench ASW2 (see Volume II, Chapter 9: Epigraphy). We recovered 170 sherds in this category, of which 73 graffiti appeared to conform to a common or dominant symbol, a sign similar to a Brahmi *ma* enclosed by arms or a vessel (Fig. 118). Other symbols, for example swastikas, serpents, stupas and staffs surrounded by enclosures, were inscribed on a further 97 sherds. A comparative analysis of graffiti symbols from Deraniyagala's sondages elsewhere in the Citadel failed to yield a similarly high percentage of ASW2's dominant symbol. At AMP it numbered just under 2 percent, 0 percent at AEG, 7 percent at ADB, 8 percent at ARW, 1 percent at AG and 6 percent at ABW3. Hunt argued in the 1920s that as the majority of such 'megalithic' symbols had been made after firing, they were not potters' marks (Hunt 1924: 150). Indeed, he suggested that, rather than belonging to an individual, they represented 'tribal ownership marks' (ibid.). This theory is similar to that of Yazdani, who suggested that the graffiti could represent ideographs or phonograms (Yazdani 1917: 70), later reiterated by Paranavitana (Paranavitana 1970: xxv) and Seneviratne (Seneviratne 1992: 109). If such a symbol may represent a tribal or family mark, then it may be suggested that ASW2's dominant symbol could be loosely correlated with a group living in this particular locality within the settlement – confirming a spatial and even, perhaps, a social continuity (Coningham 1994b: 66–68). It is interesting to note that similar suggestions have been made by other archaeologists over similar repetitive structural sequences (Halstead 1989: 76).

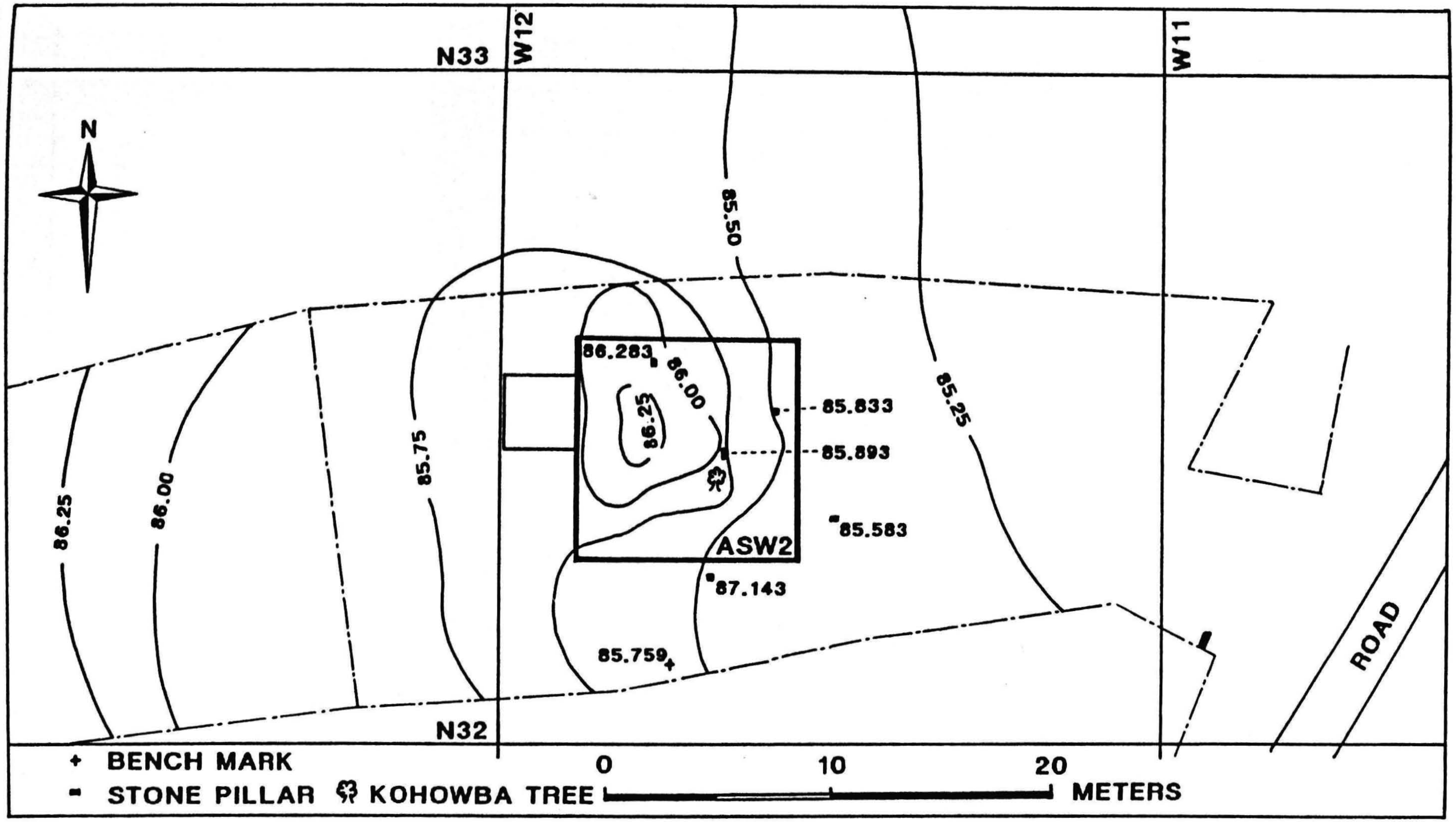


Fig. 51: Plan of ASW2's immediate environment

Fig. 52: Exposed pillar tops at ASW2

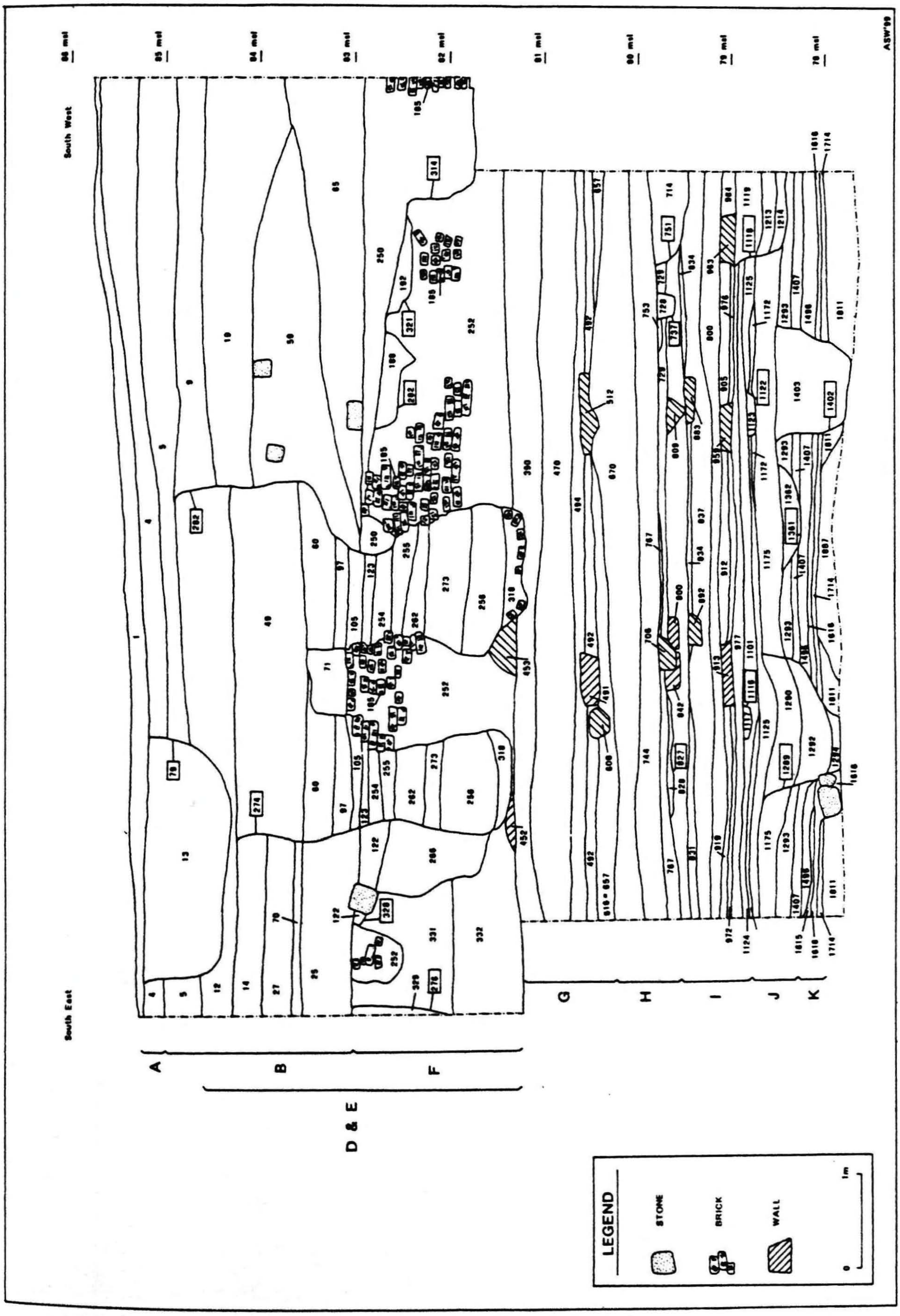


Fig. 53: Southern section of ASW2

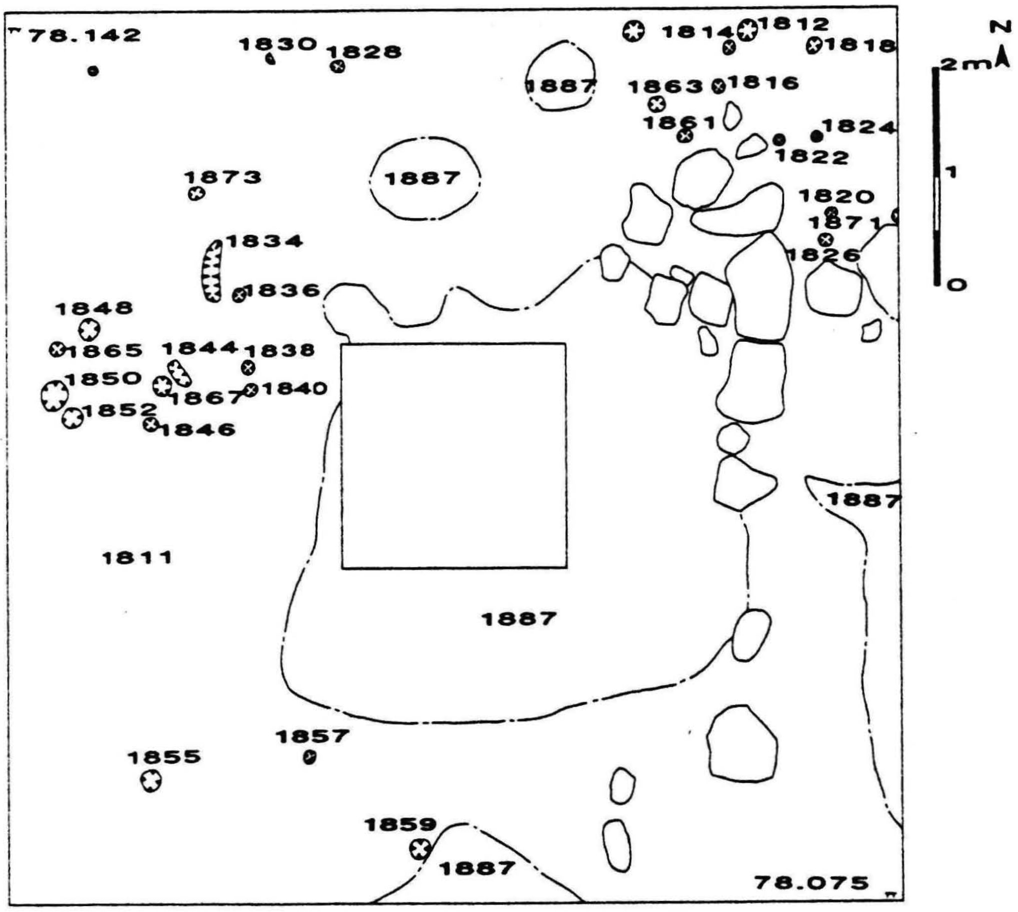


Fig. 54: Plan of structural phase K1

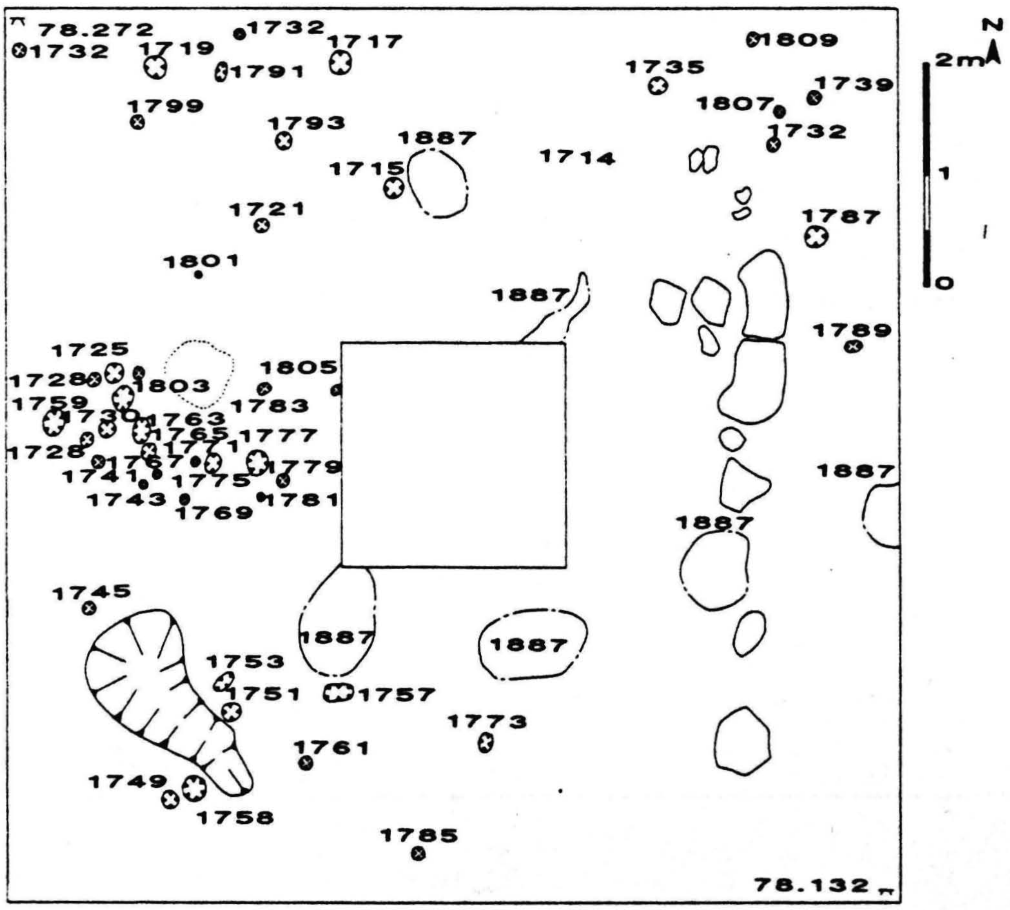


Fig. 55: Plan of structural phase K2

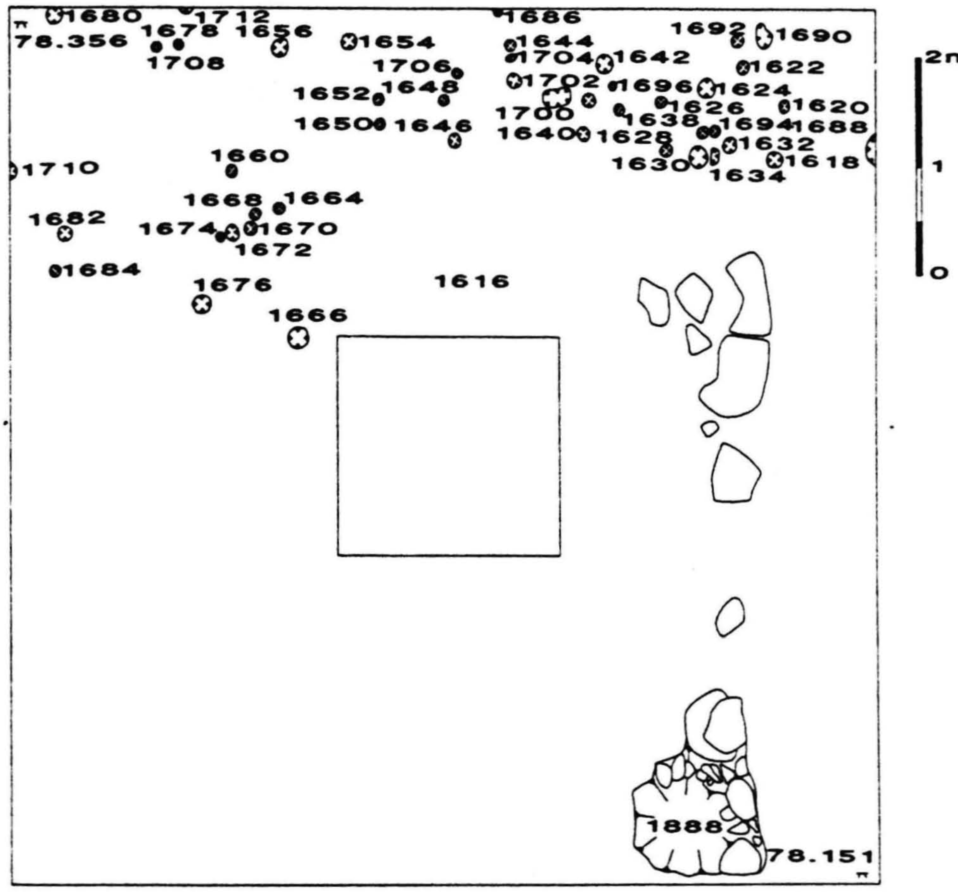


Fig. 56: Plan of structural phase K3

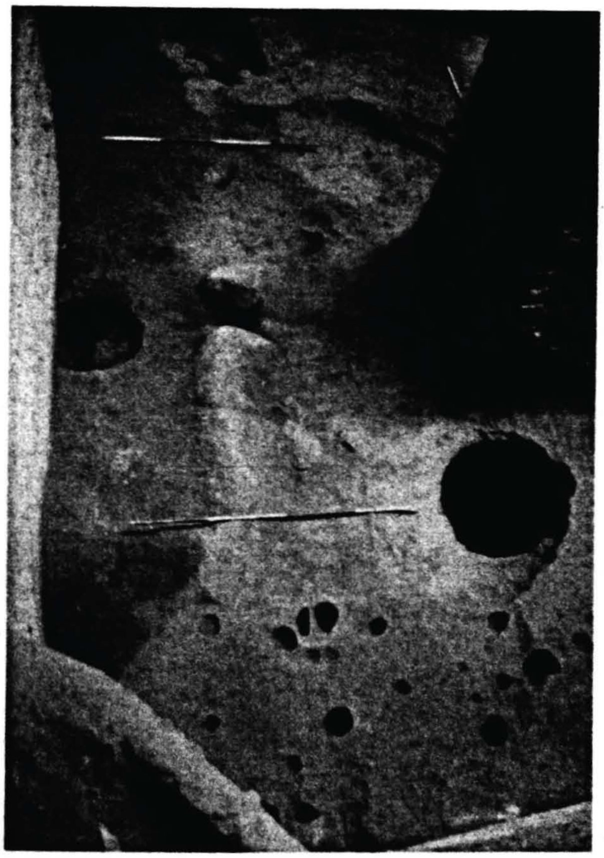


Fig. 57: Structural phase K3 from the northeast

Fig. 58: Well 1279 (structural phase K3)

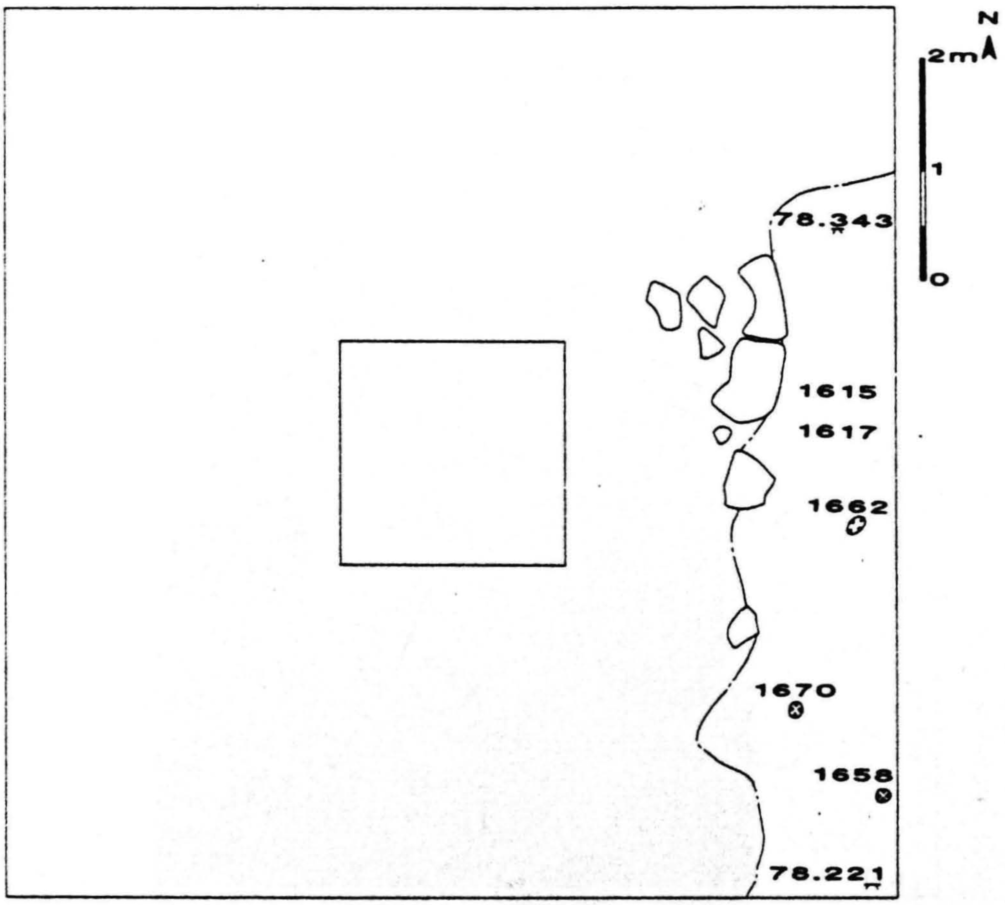


Fig. 59: Plan of stratigraphic phase XI

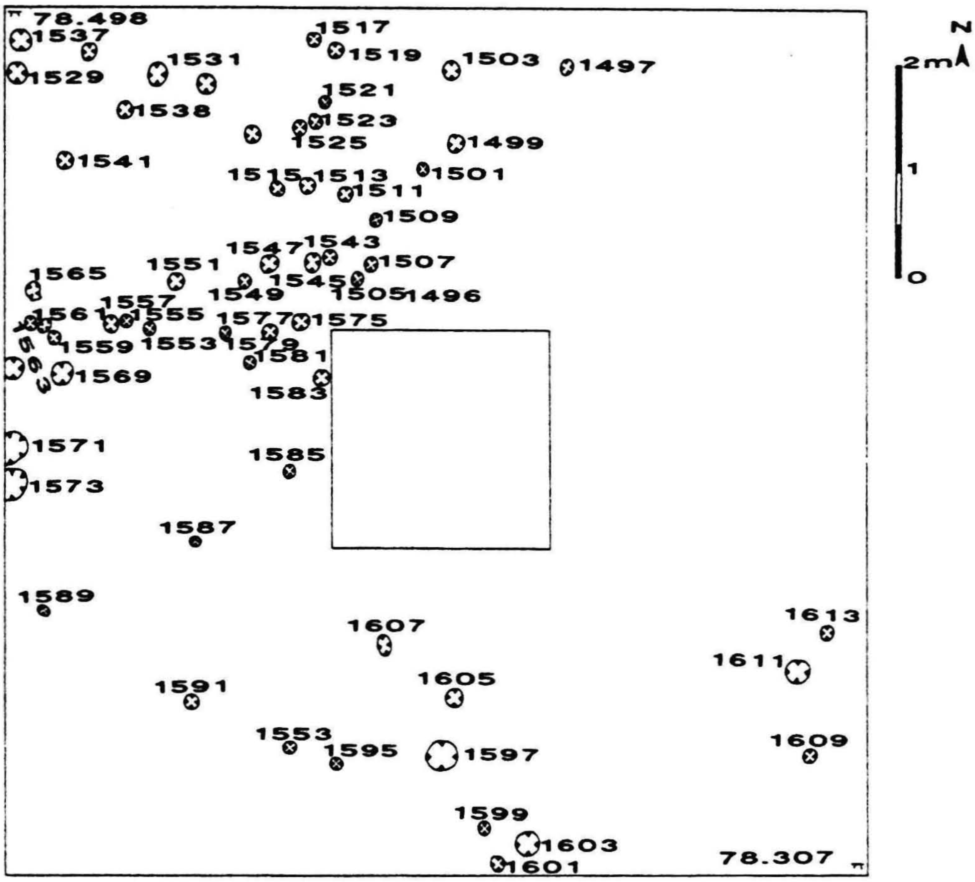


Fig. 60: Plan of structural phase J1

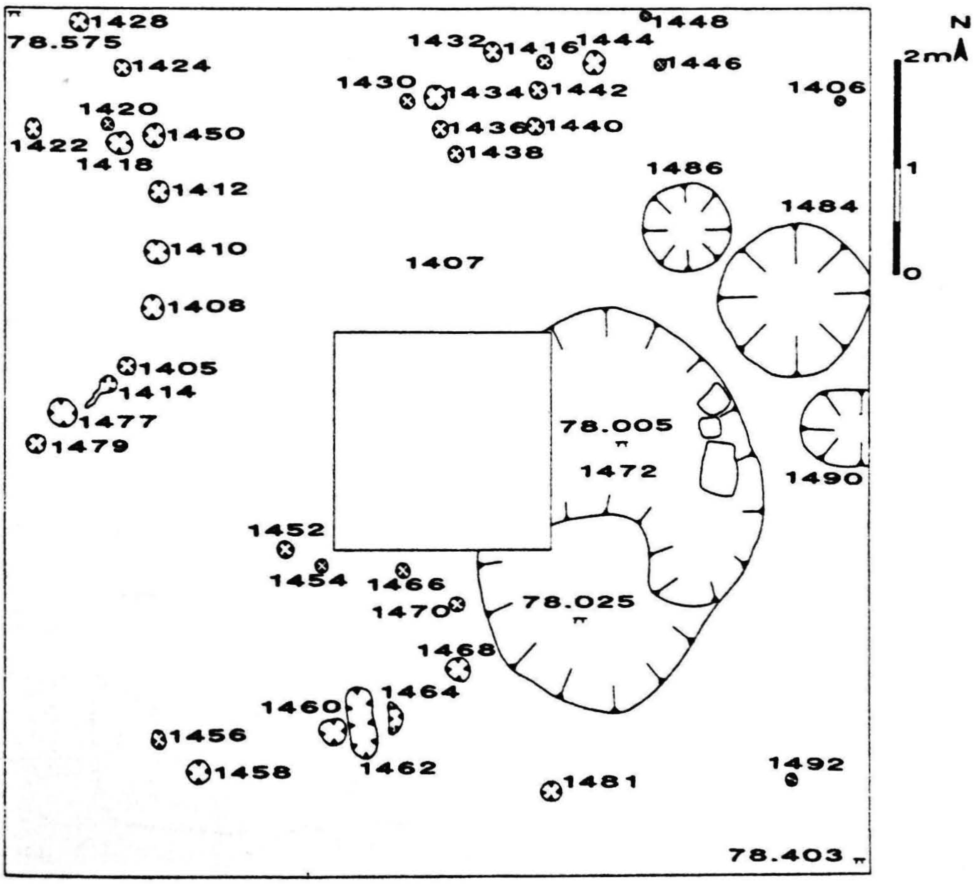


Fig. 61: Plan of structural phase J2

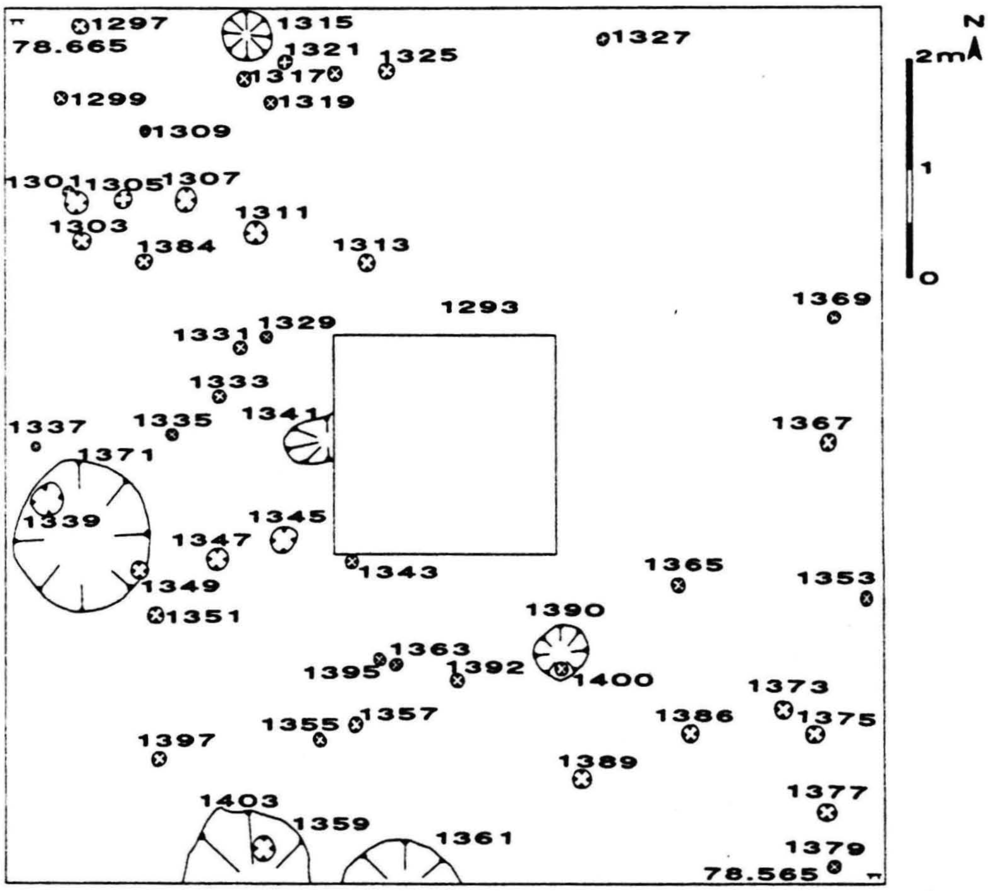


Fig. 62: Plan of structural phase J3

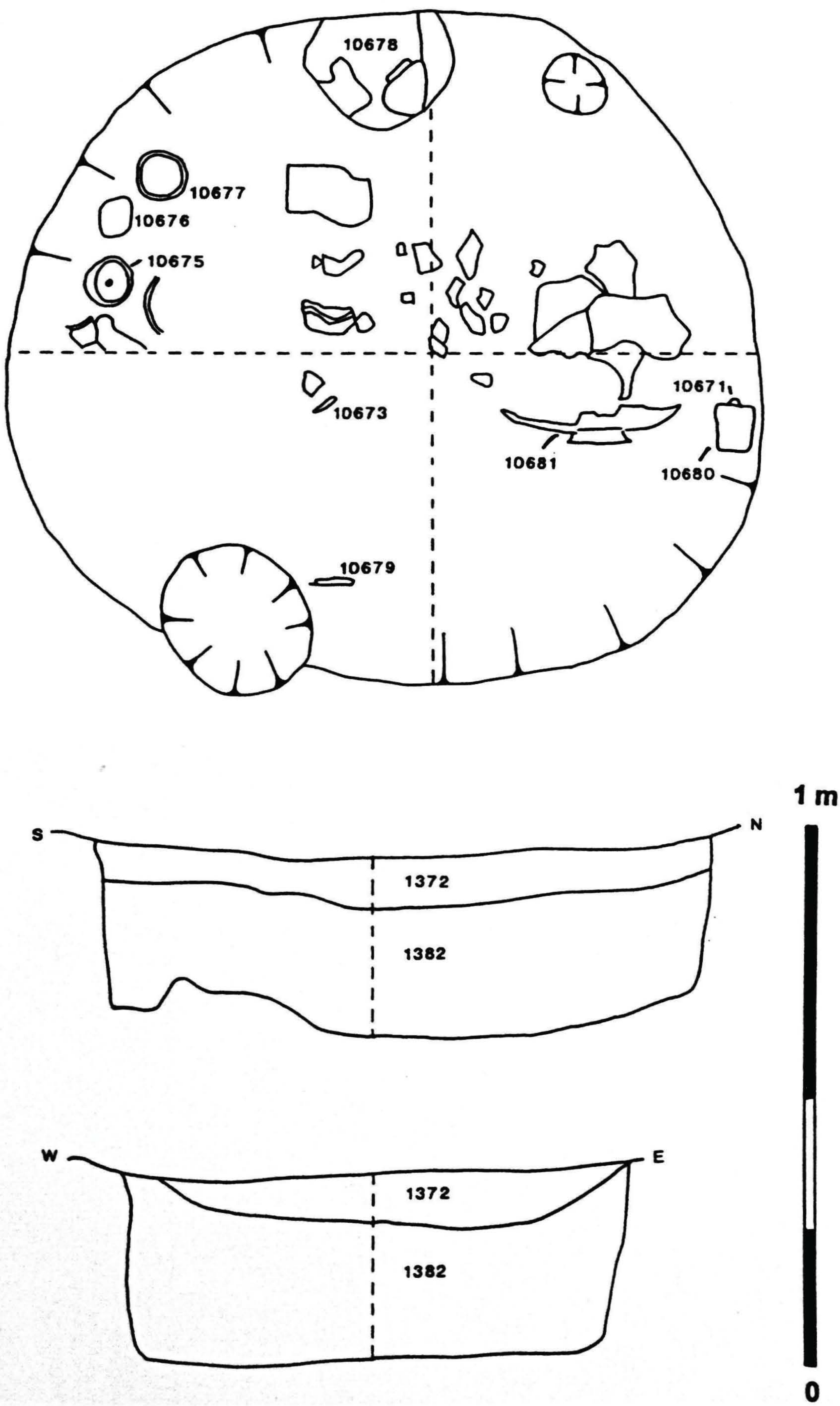


Fig. 63: Plan of pit 1371 (structural phase J3)

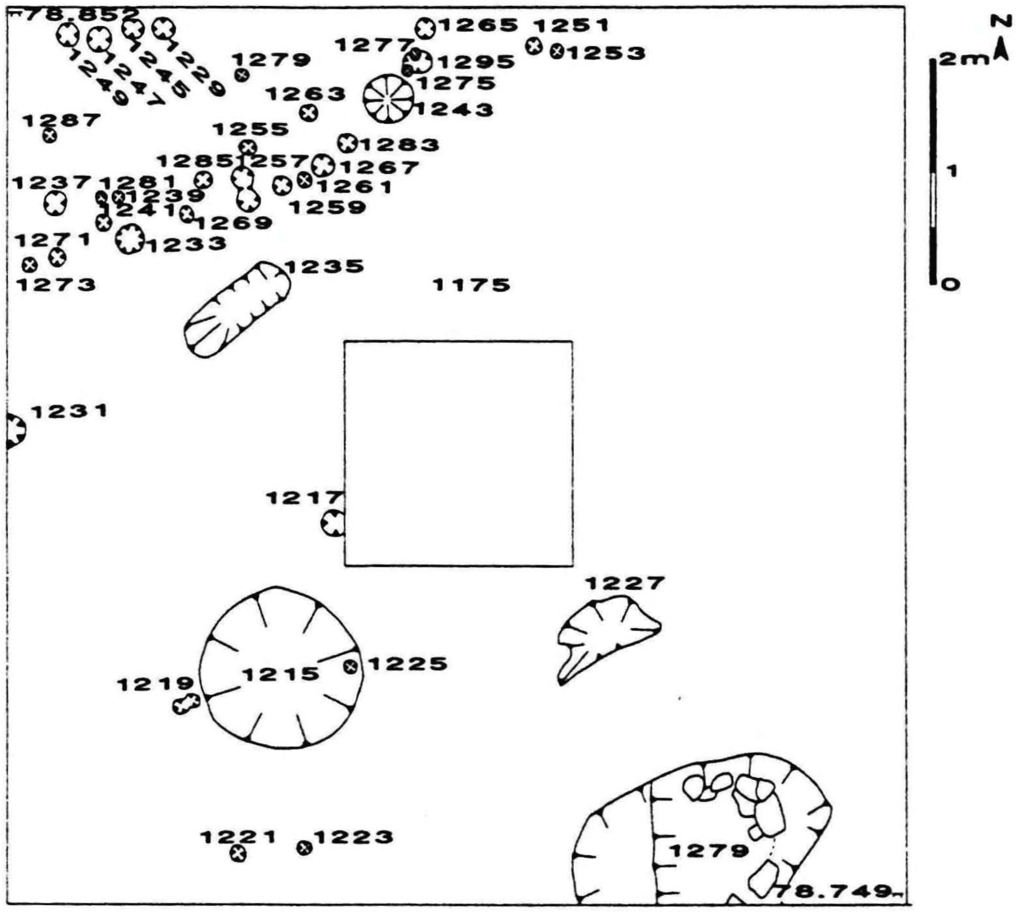


Fig. 64: Plan of structural phase J4

Fig. 65: Structural phase J4

Fig. 66: Furnace or oven 1235 (structural phase J4)

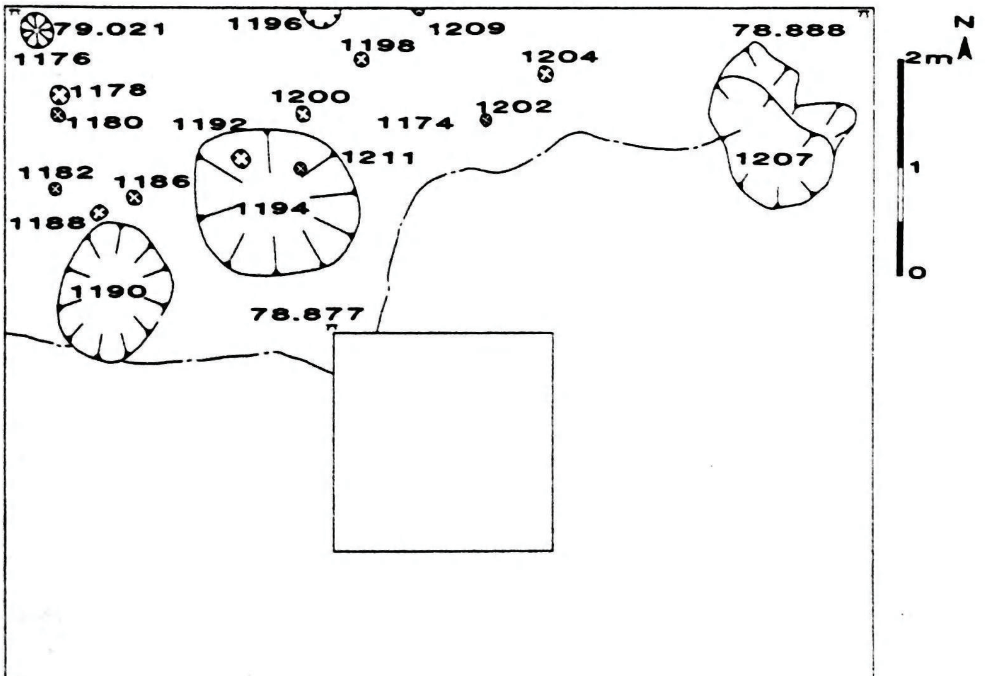


Fig. 67: Plan of structural phase J5

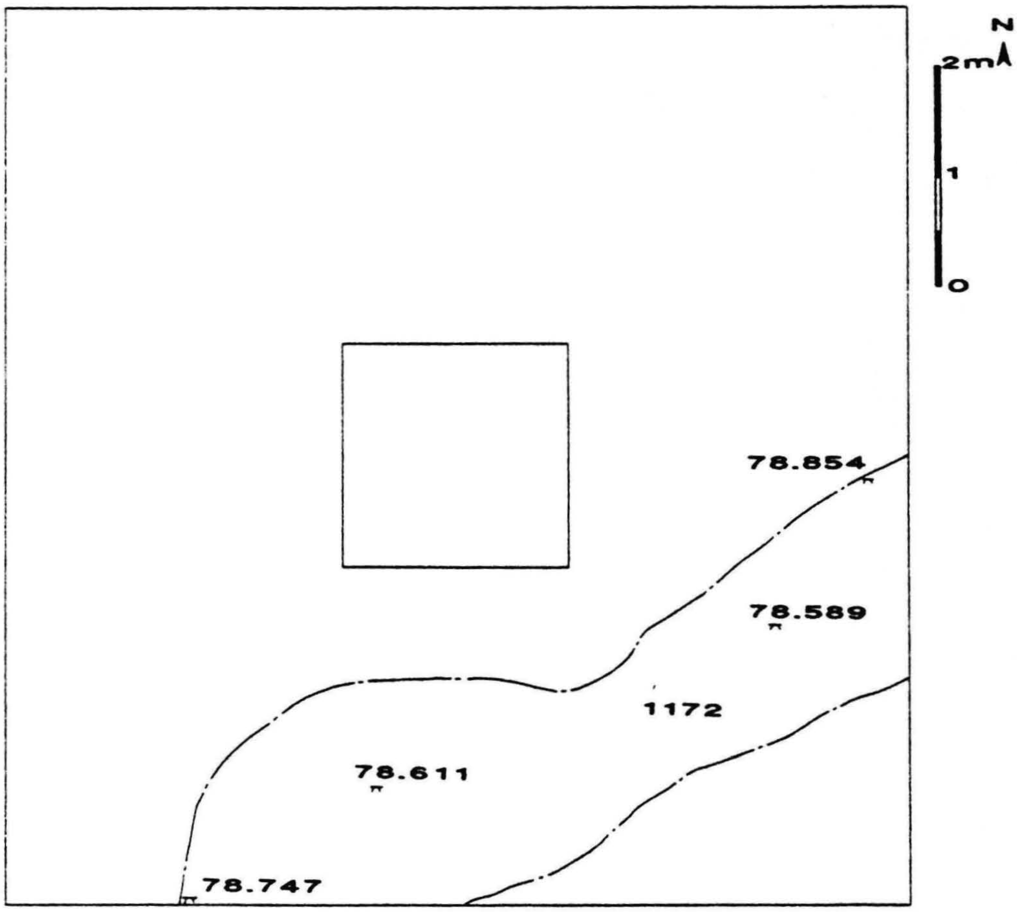


Fig. 68: Plan of stratigraphic phase XXII

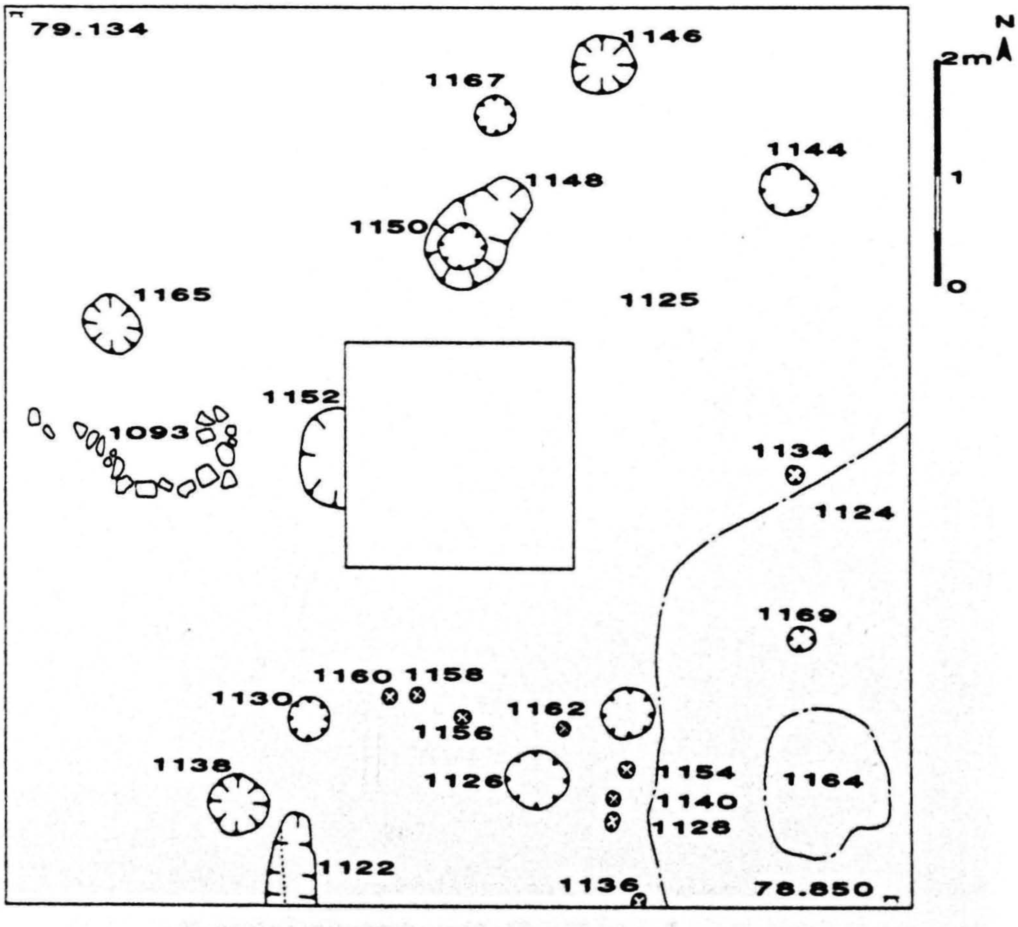


Fig. 69: Plan of structural phase I1

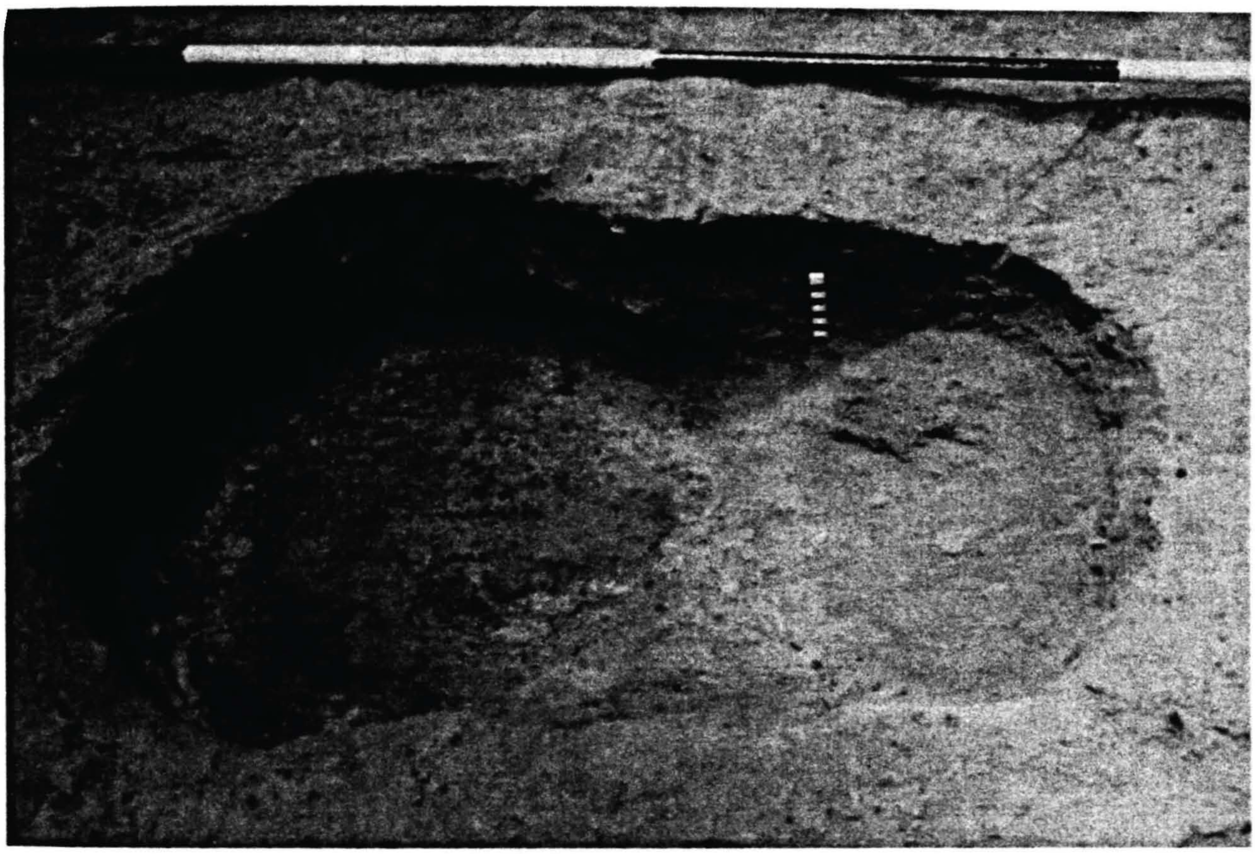


Fig. 70: Furnace or oven 1148 (structural phase I1)

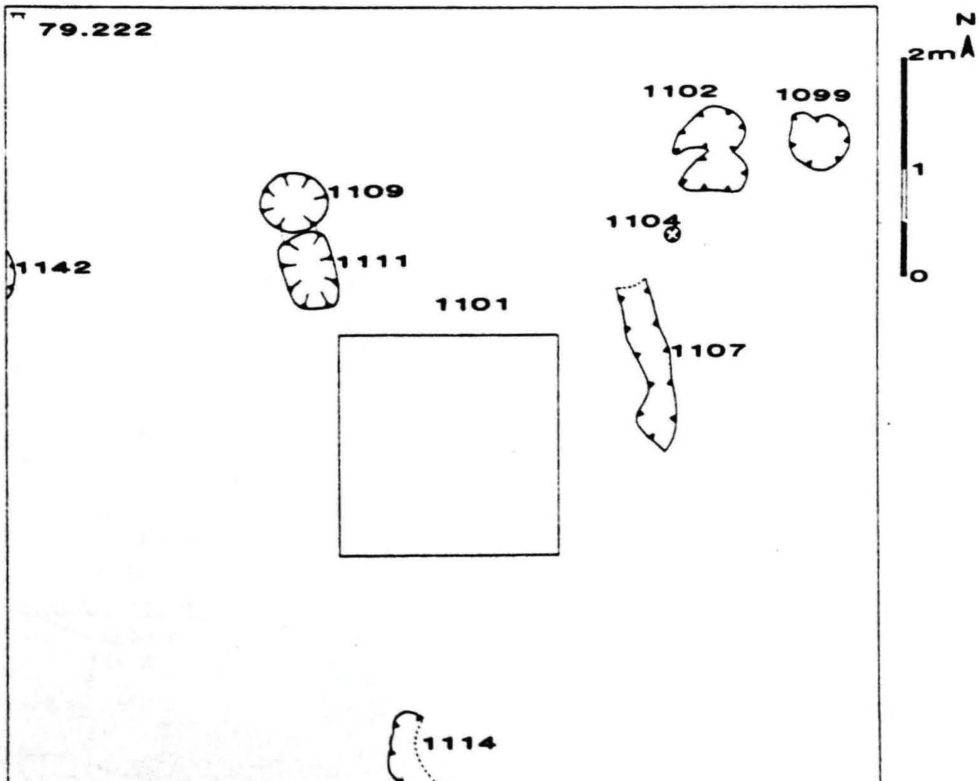


Fig. 71: Plan of structural phase I2

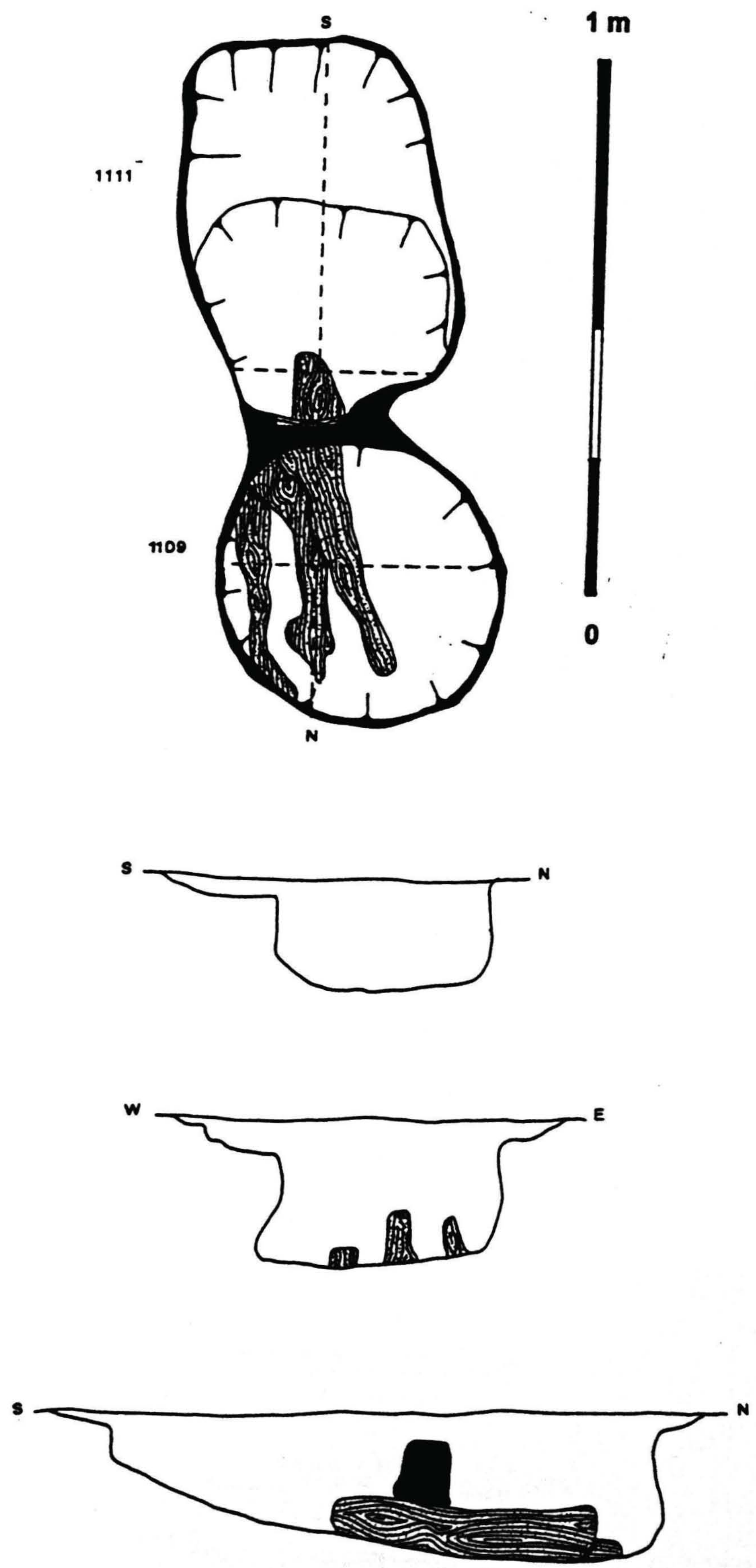


Fig. 72: Plan of furnace or oven 1109 and 1111 (structural phase I2)

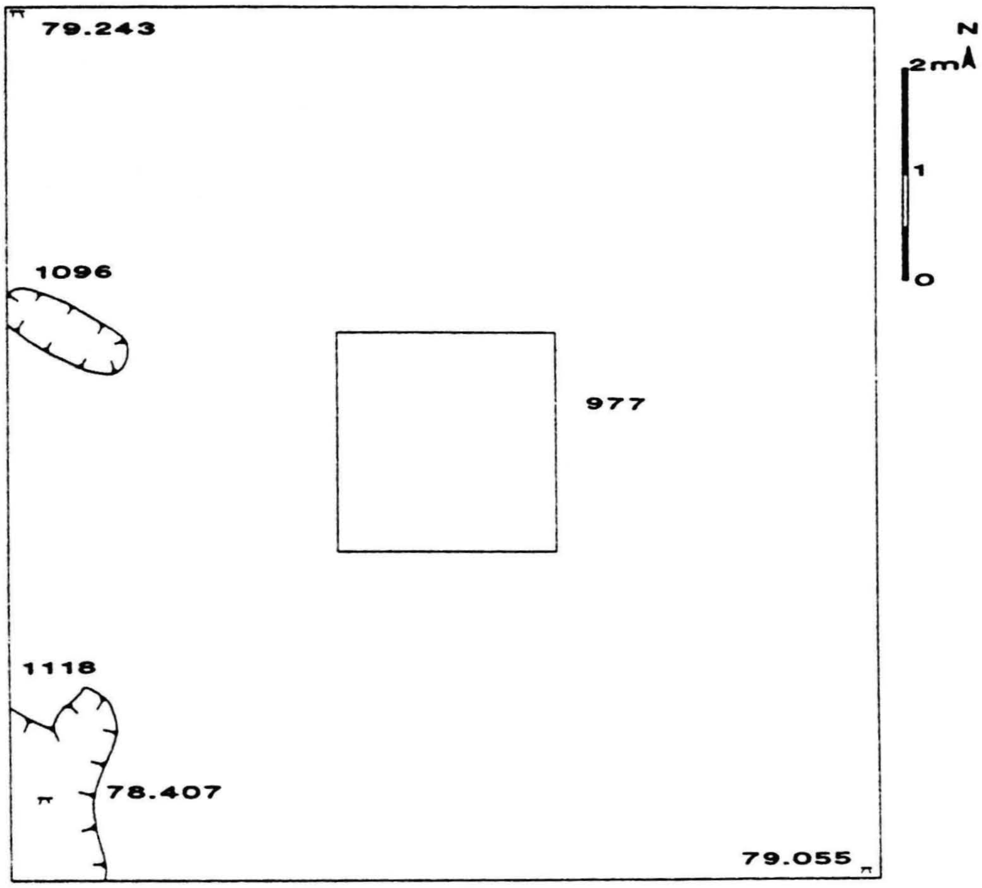


Fig. 73: Plan of structural phase I3

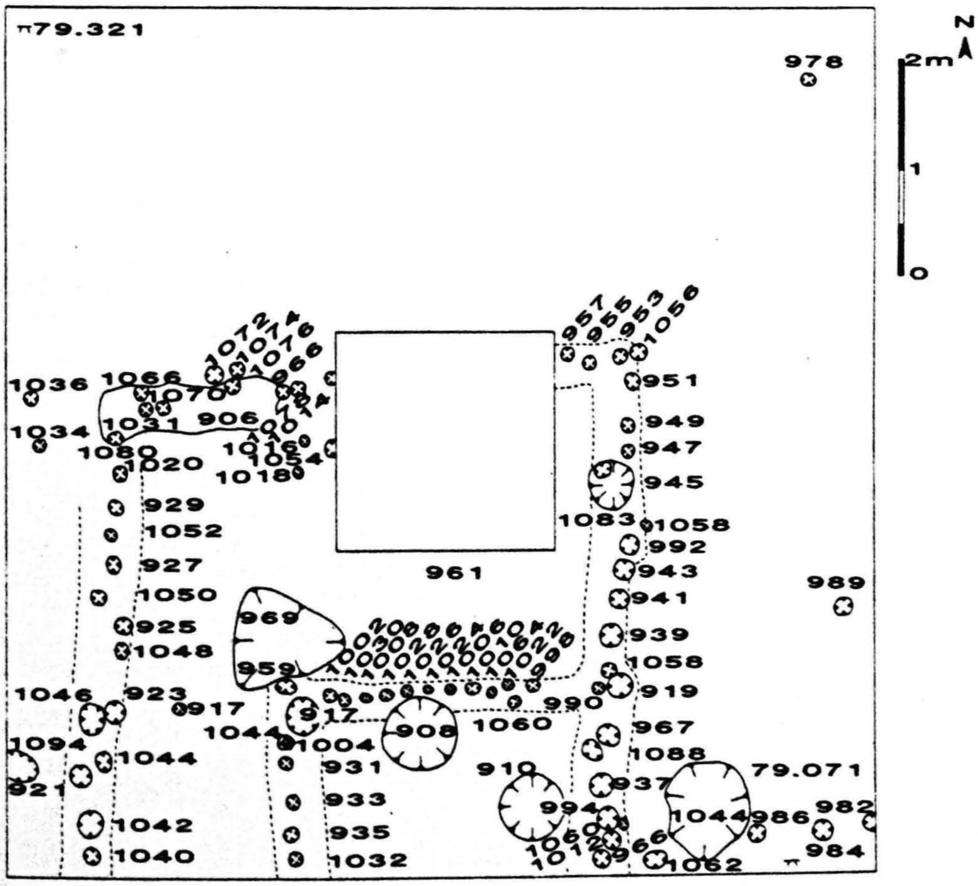


Fig. 74: Plan of structural phase I4

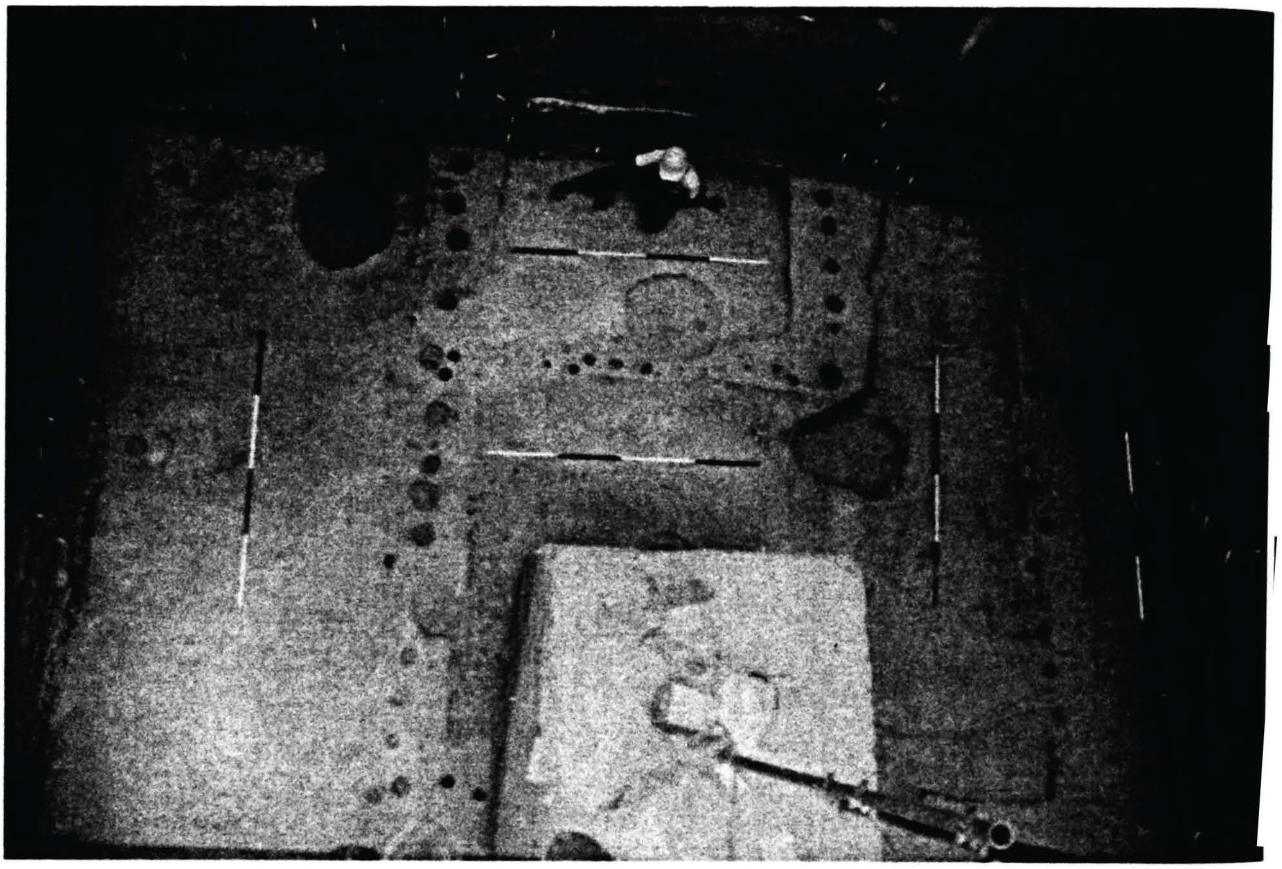


Fig. 75: Structural phase I4

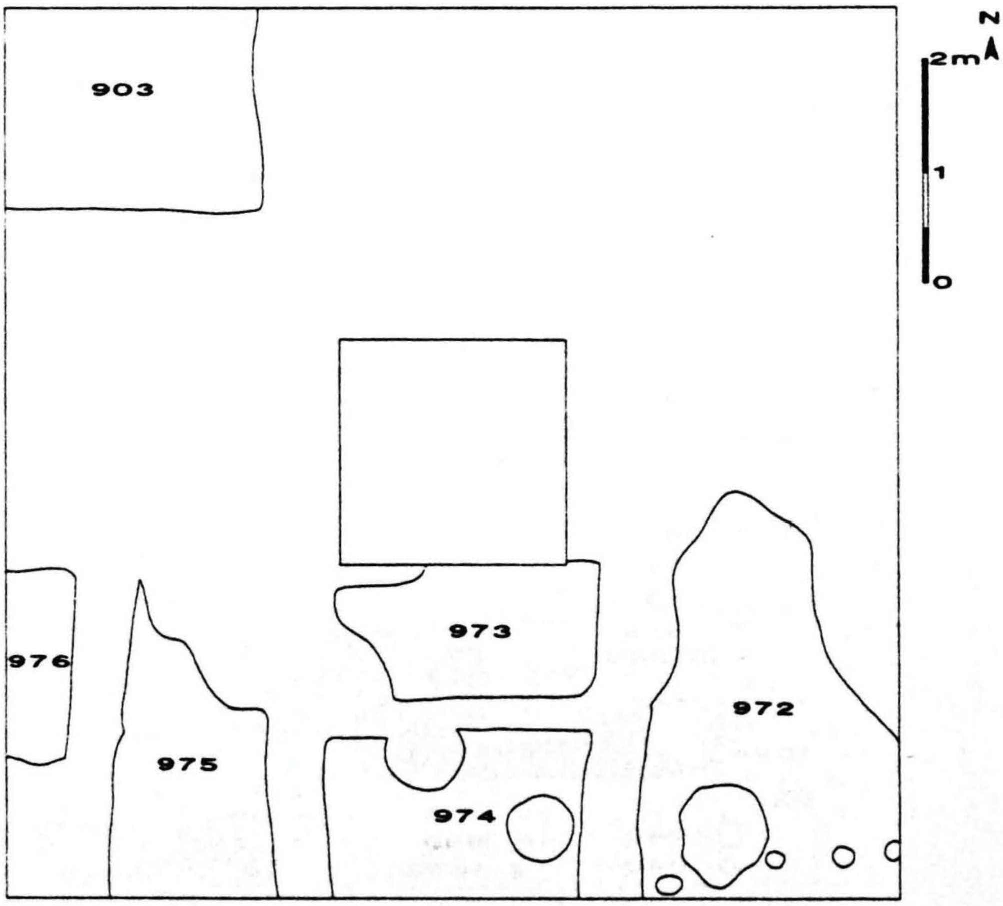


Fig. 76: Plan of clay floors 972, 973, 974, 975 and 976 (structural phase I4)

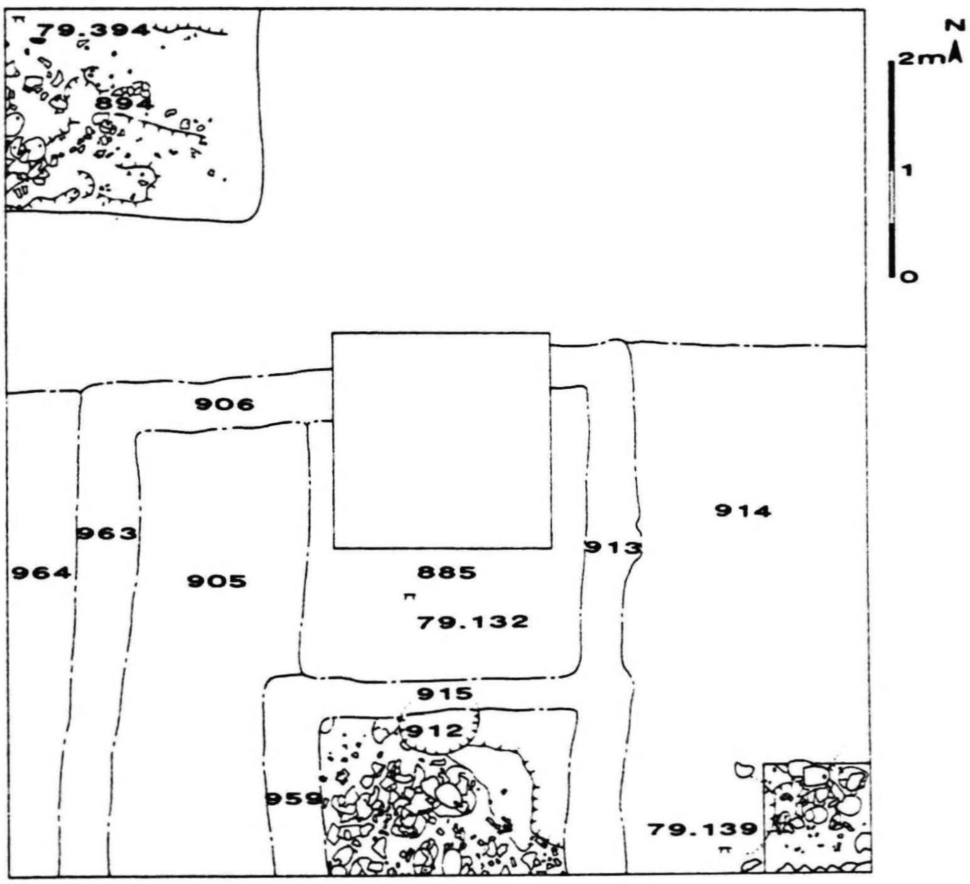


Fig. 77: Plan of tile collapse 894, 905, 912 and 914 (structural phase I4)

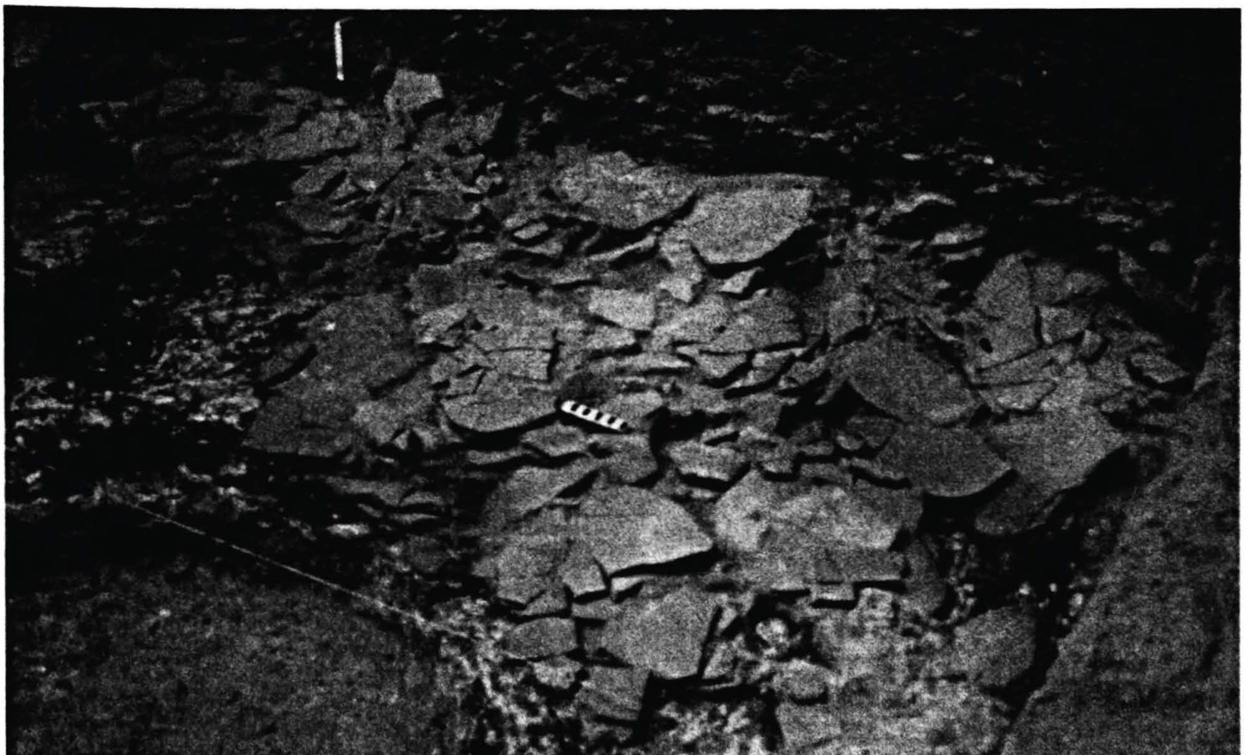


Fig. 78: Tile collapse 894, 905, 912 and 914 (structural phase I4)

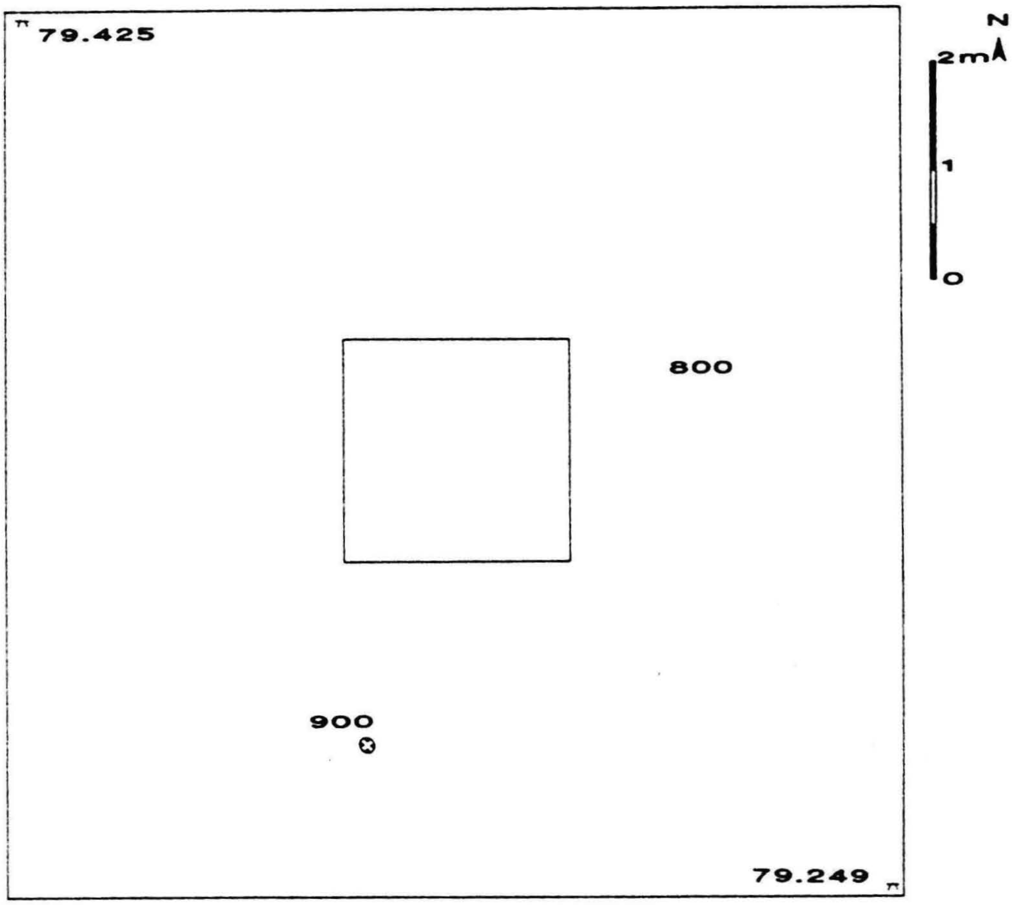


Fig. 79: Plan of structural phase I5

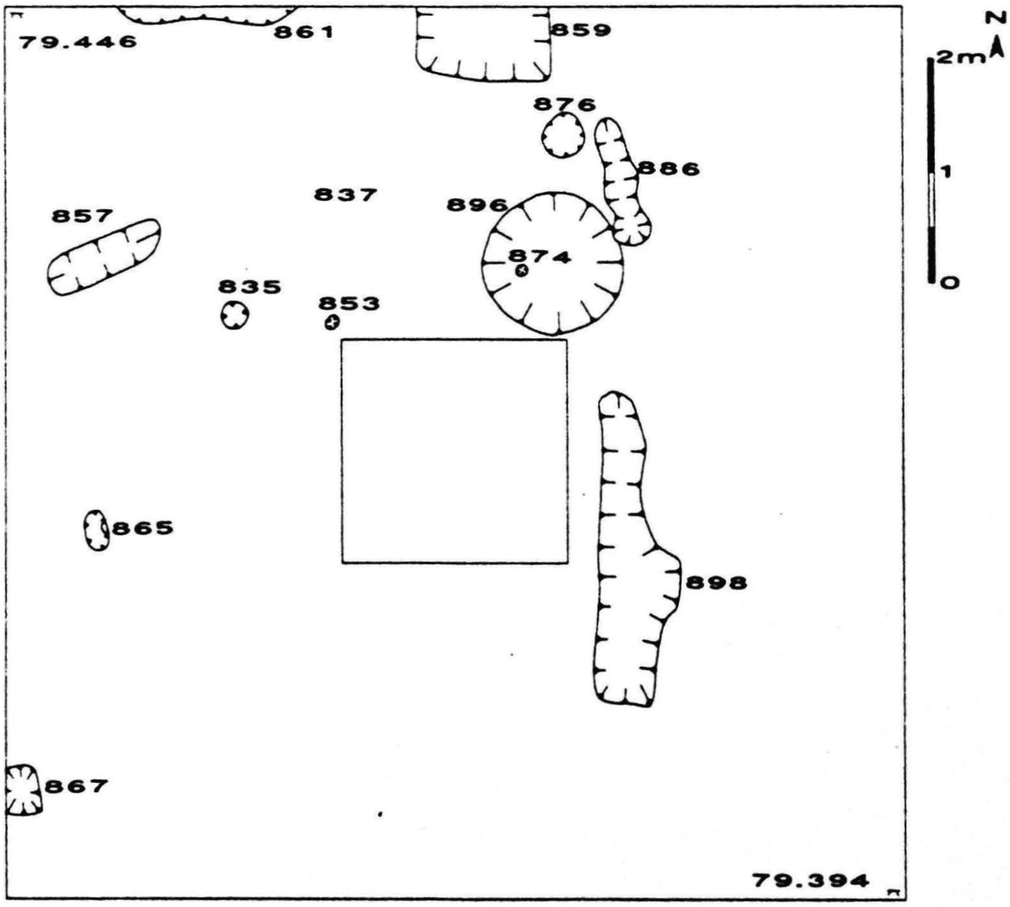


Fig. 80: Plan of structural phase I6

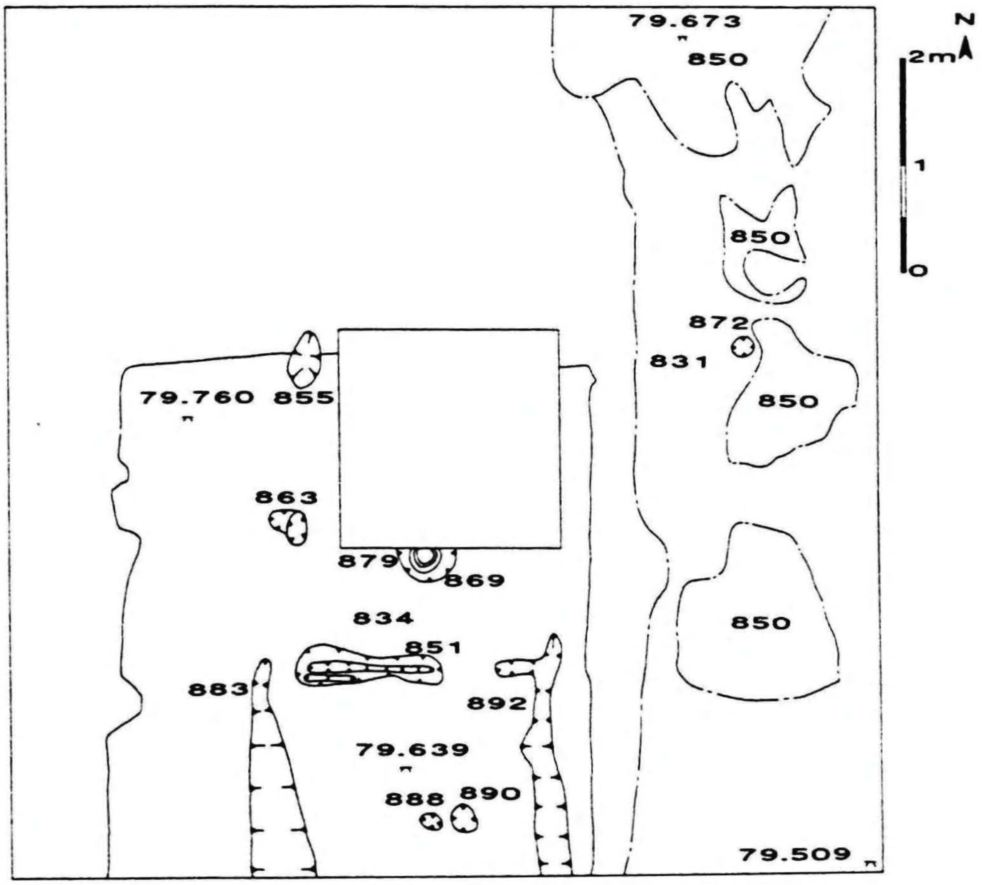


Fig. 81: Plan of structural phase I6

Fig. 82: View of vessel 879 in situ (structural phase I6)

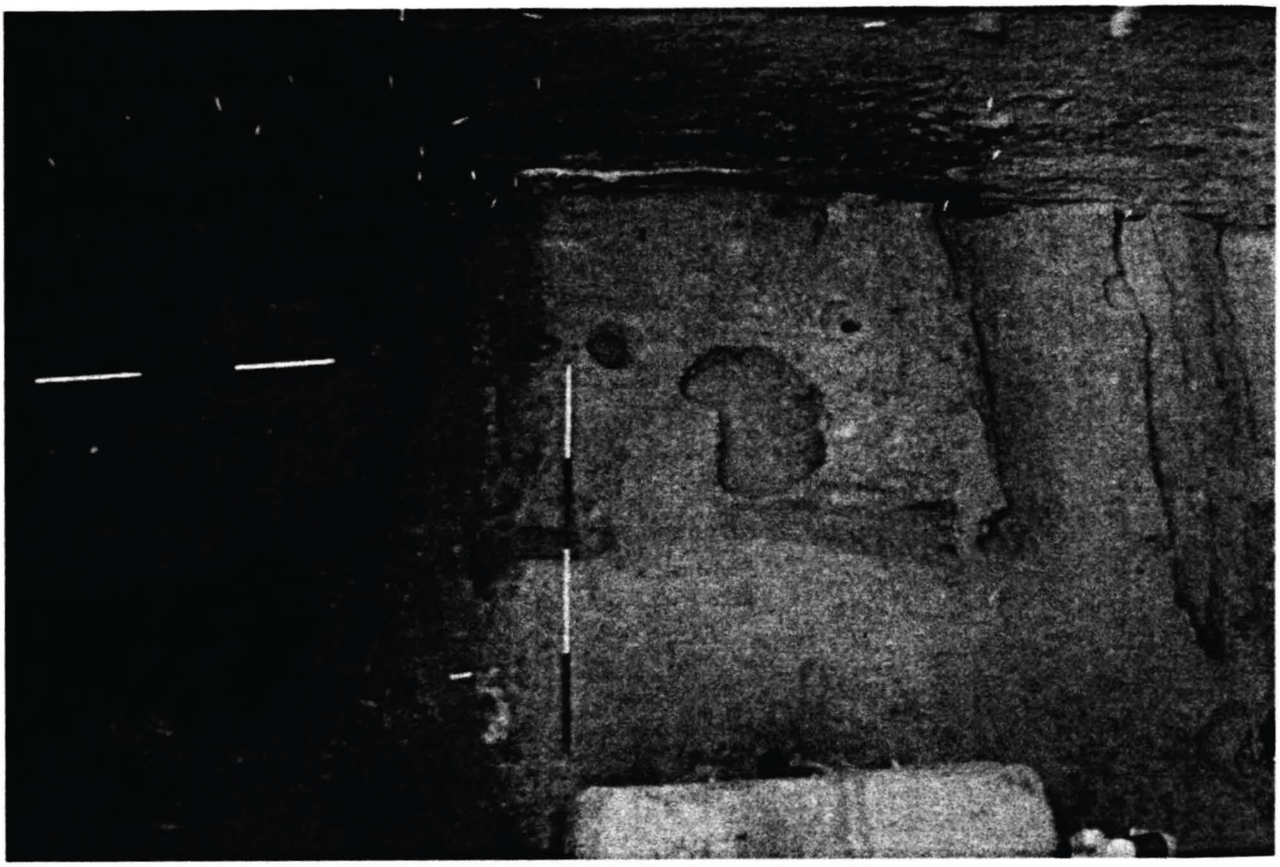


Fig. 83: Structural phase I7

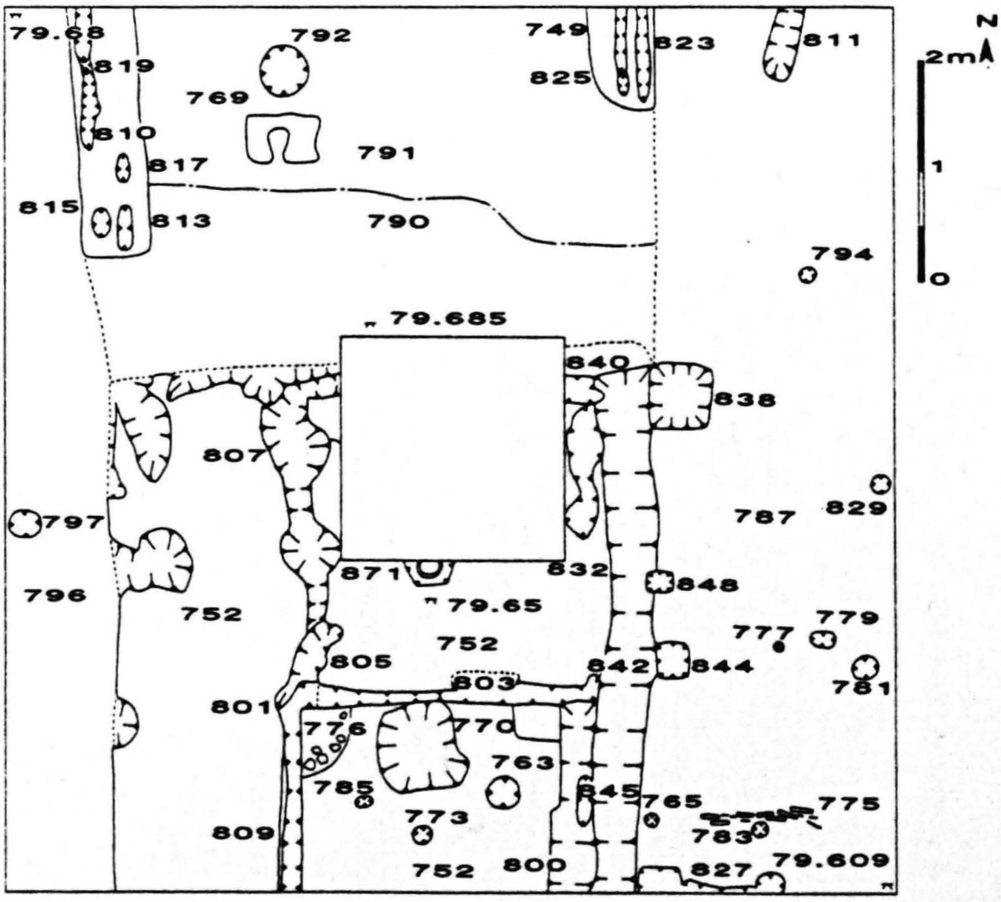


Fig. 84: Plan of structural phase I7

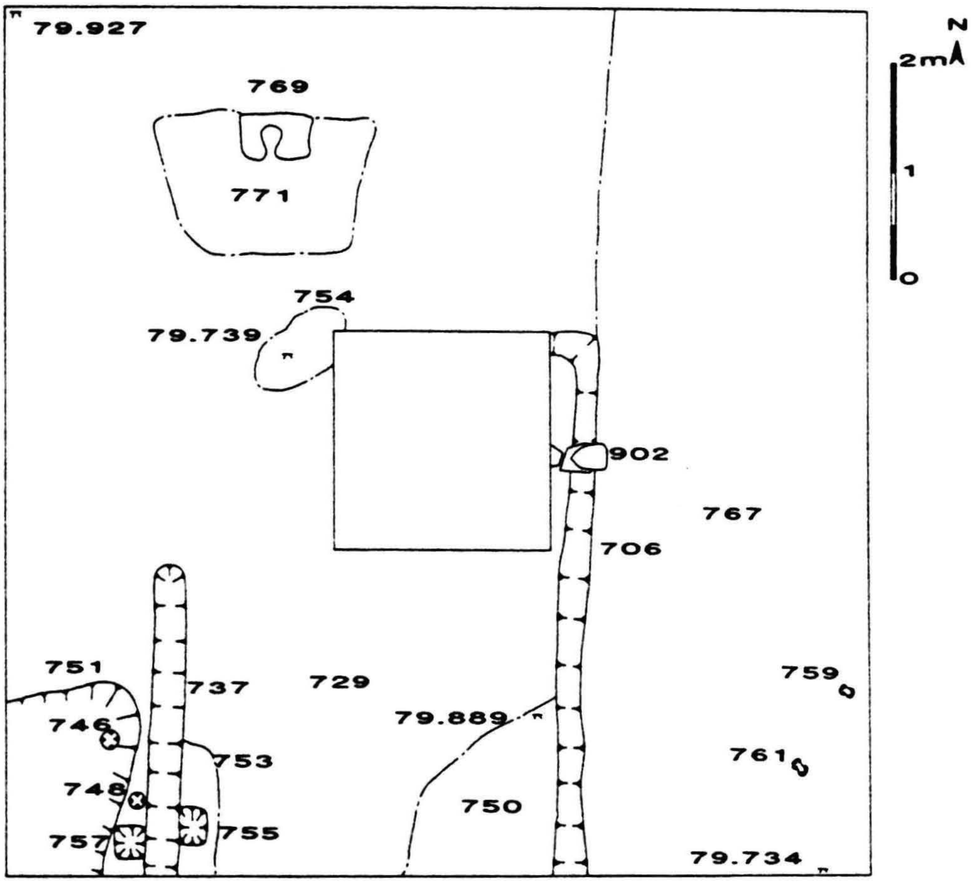


Fig. 85: Plan of structural phase I8

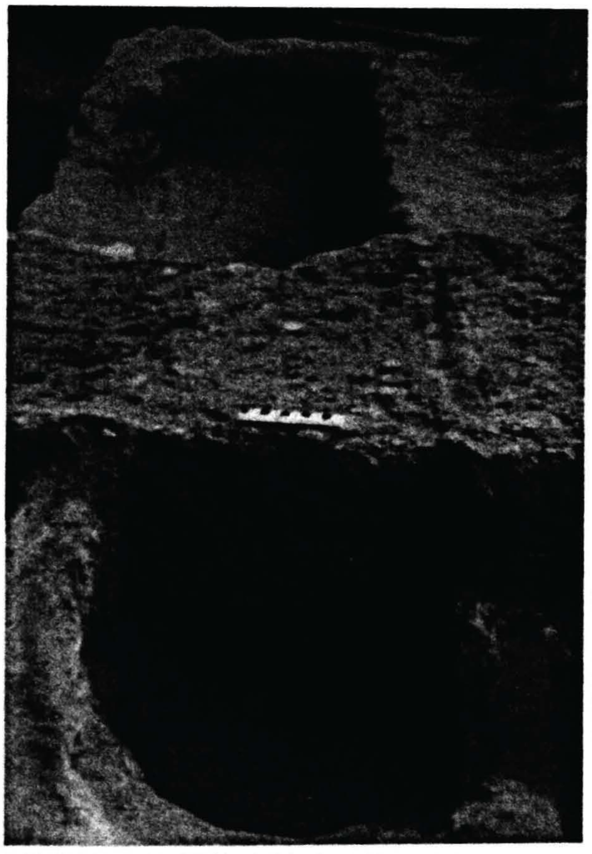


Fig. 86: Plan of trough 736 (structural phase H1)

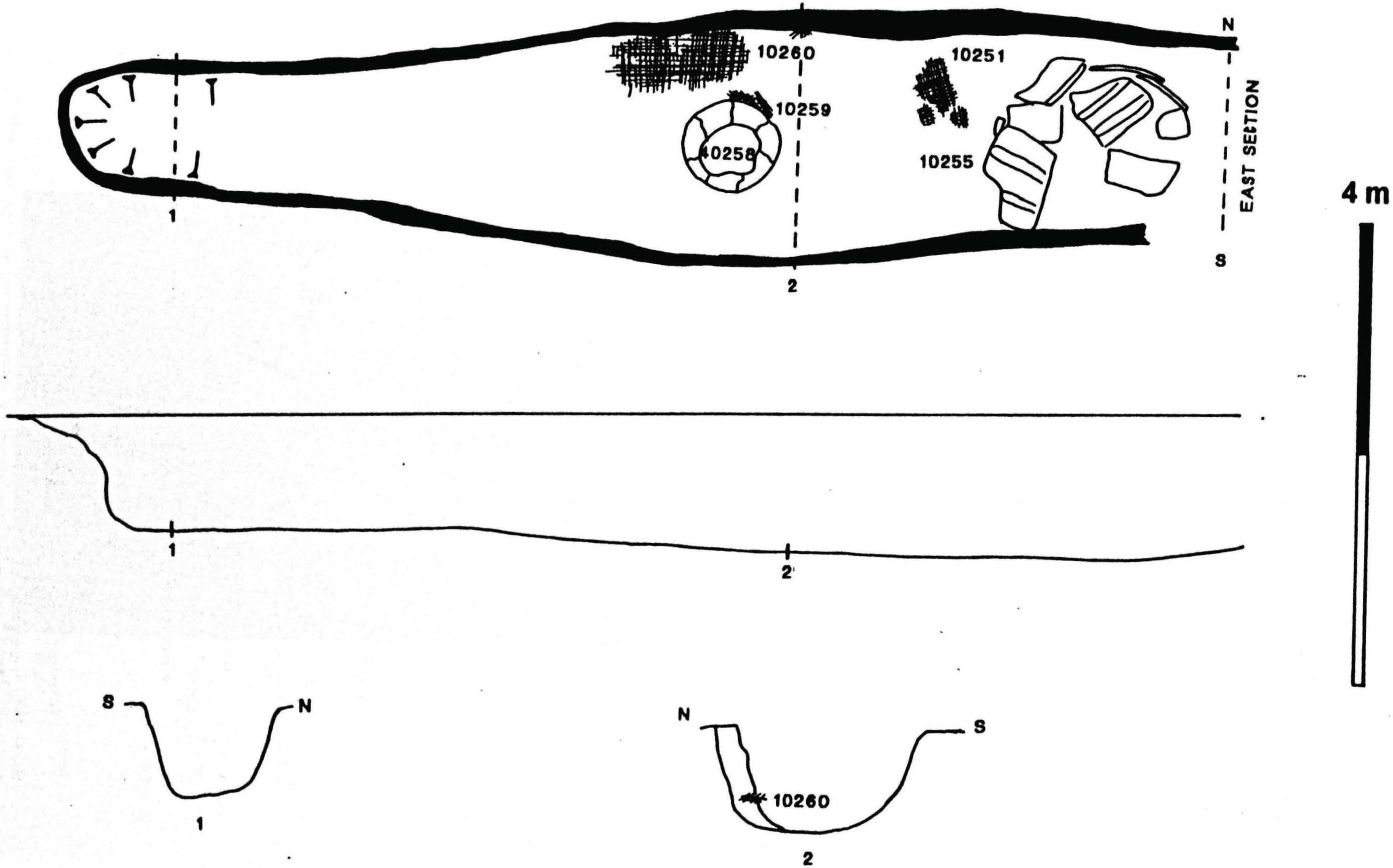


Fig. 87: Plan of trough 733 (structural phase H2)

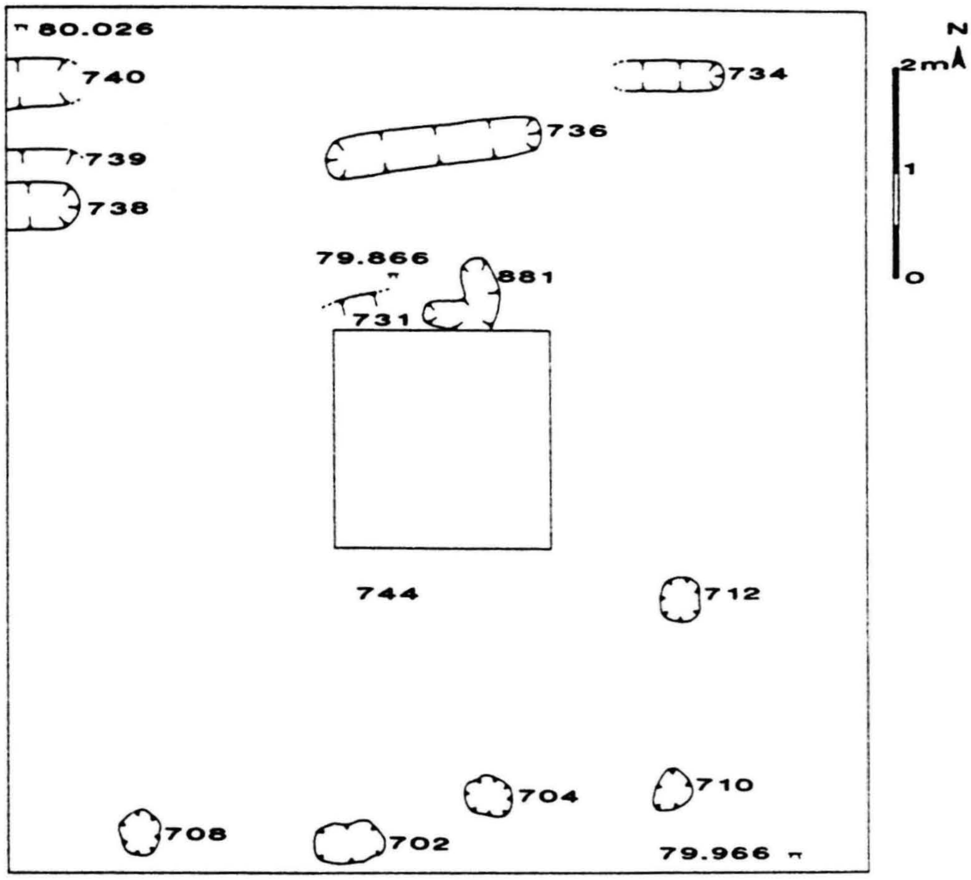


Fig. 88: Plan of structural phase H1

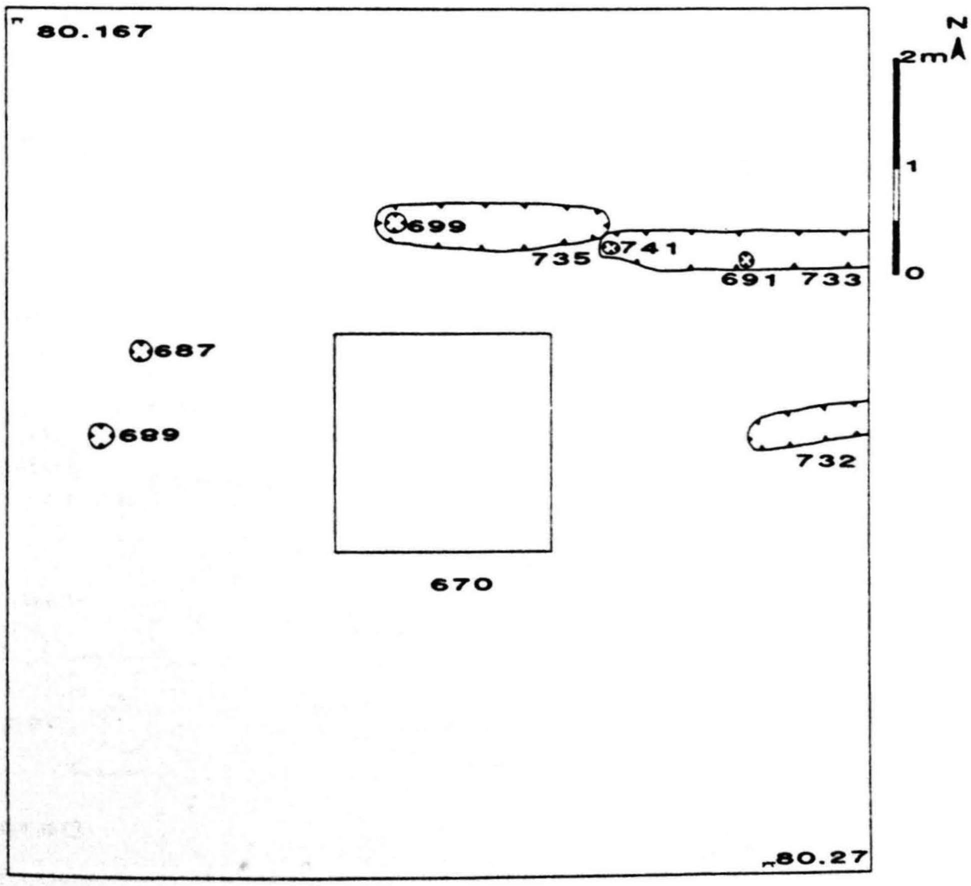


Fig. 89: Plan of structural phase H2

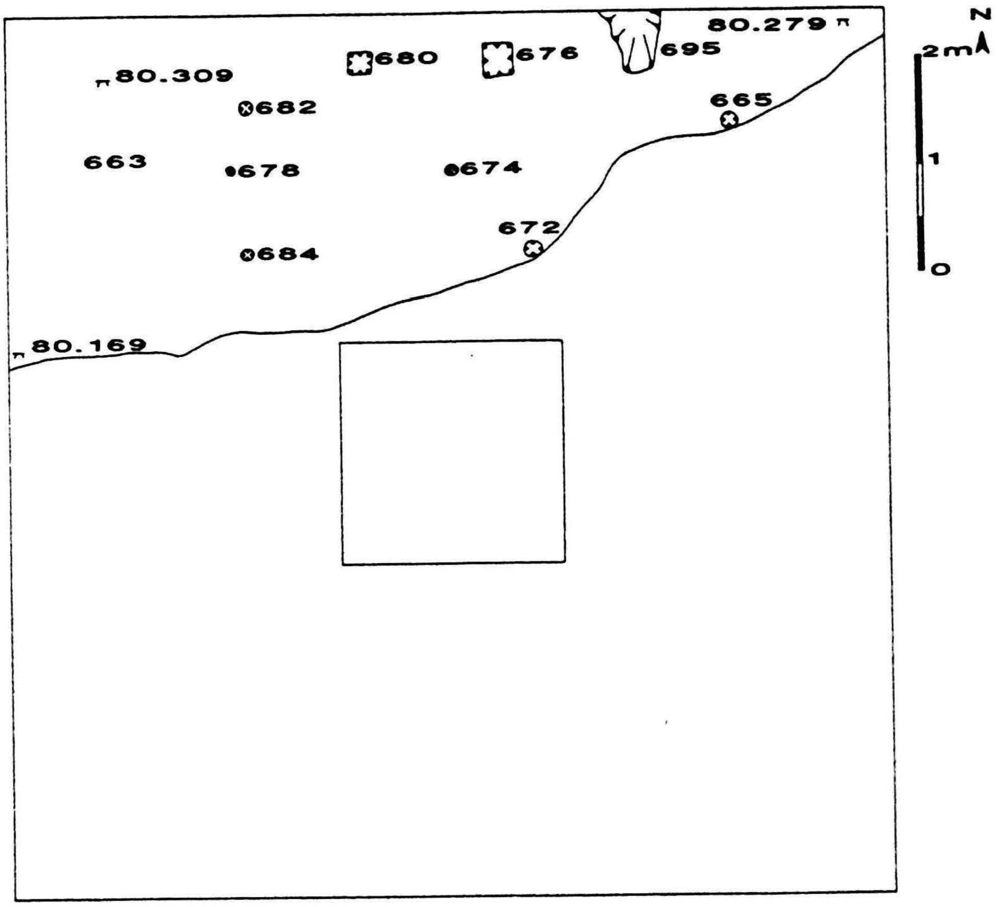


Fig. 90: Plan of structural phase G1

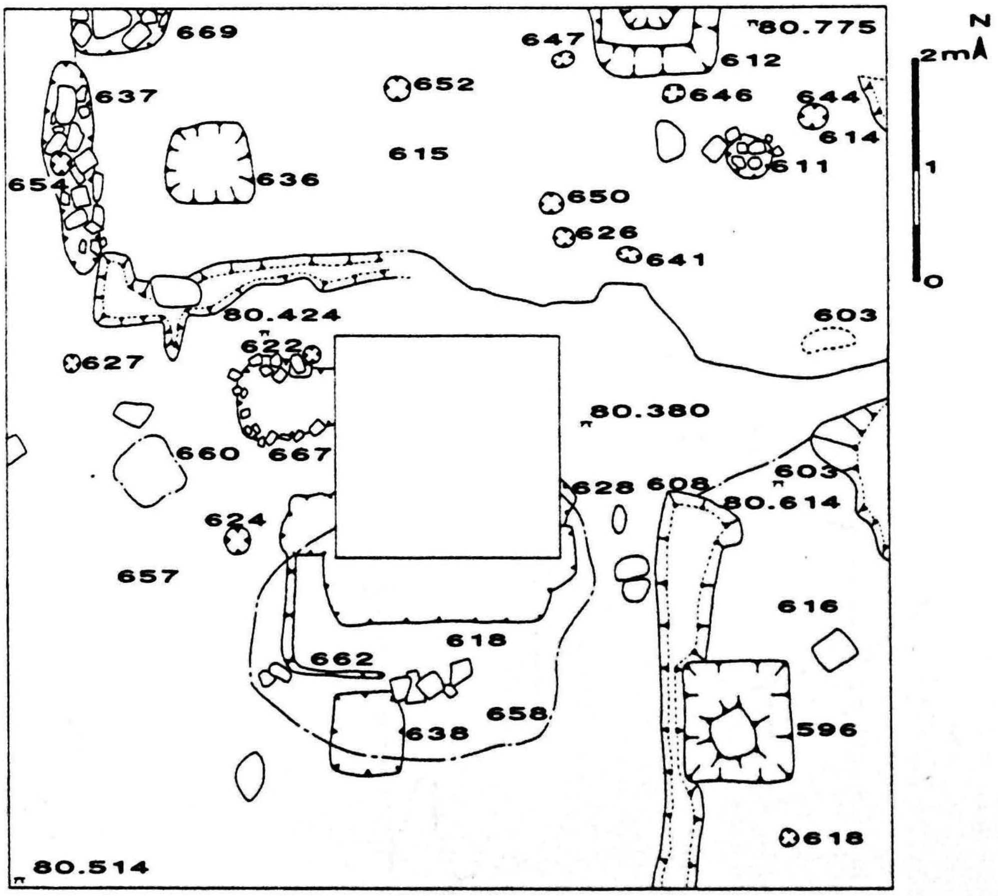


Fig. 91: Plan of structural phase G2

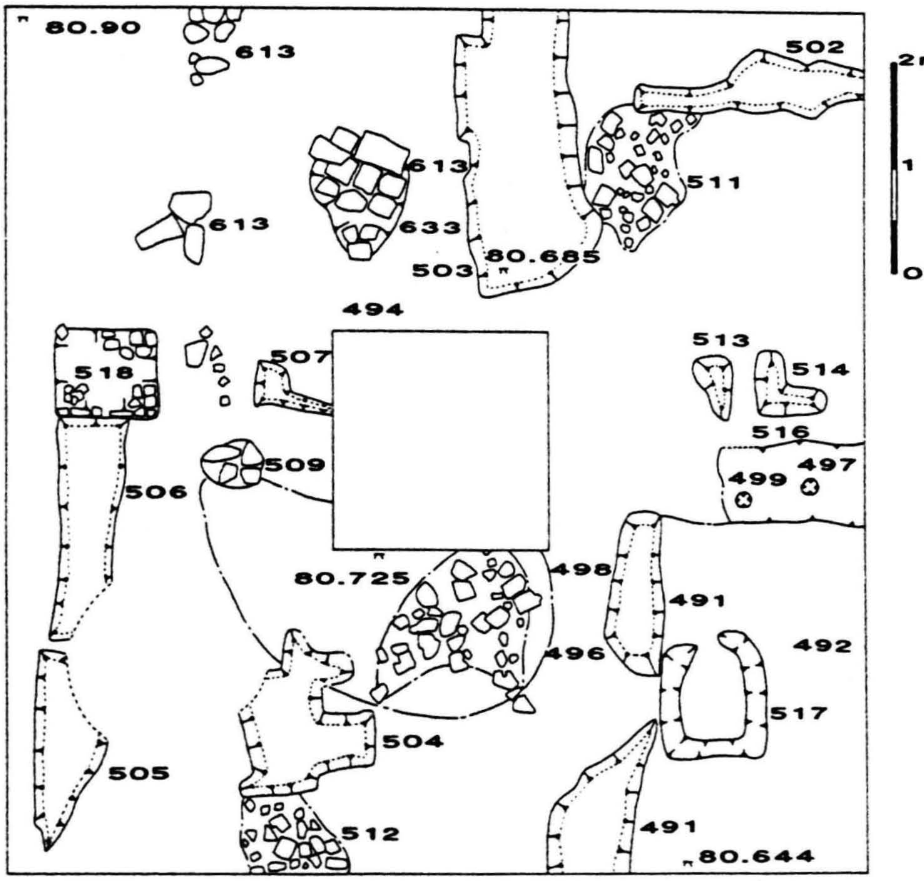


Fig. 92: Plan of structural phase G3

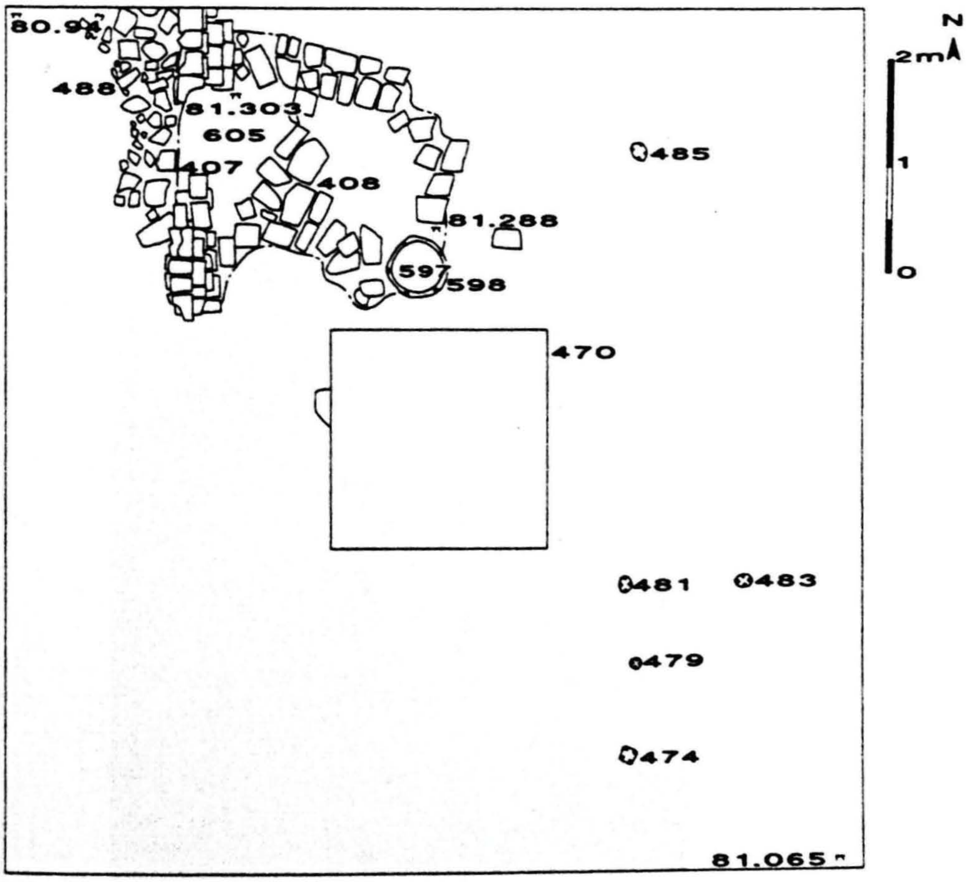


Fig. 93: Plan of structural phase G4

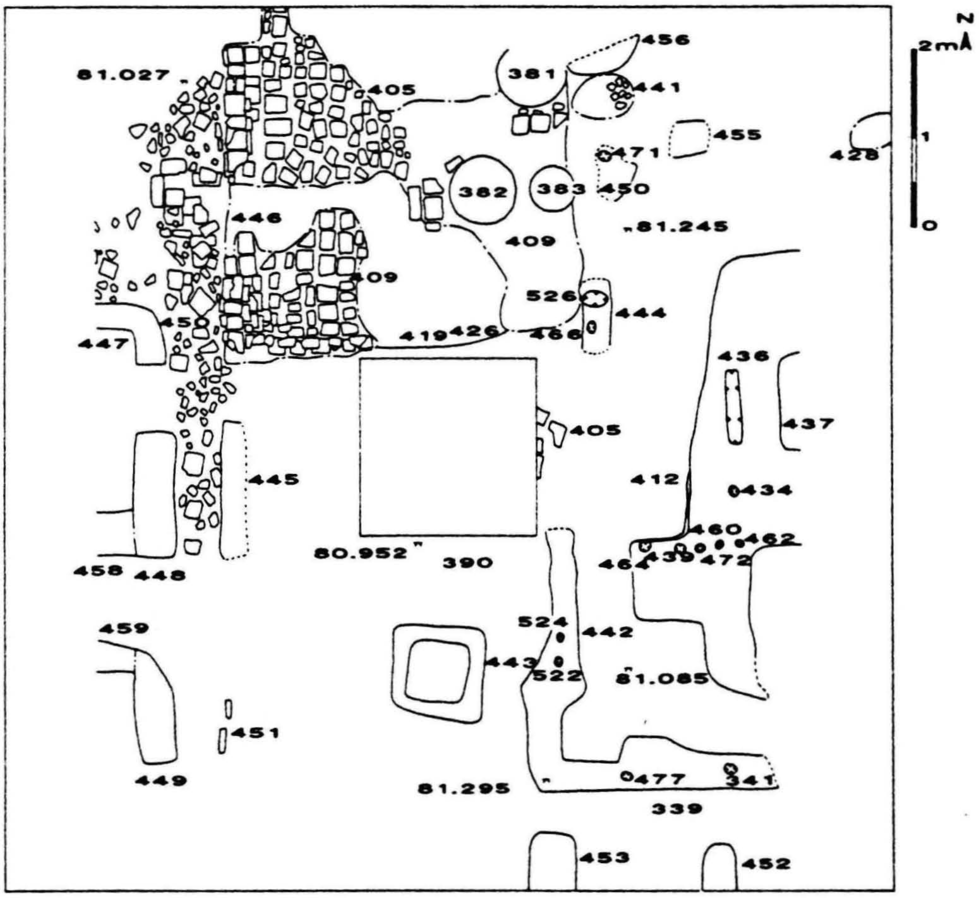


Fig. 94: Plan of structural phase G5

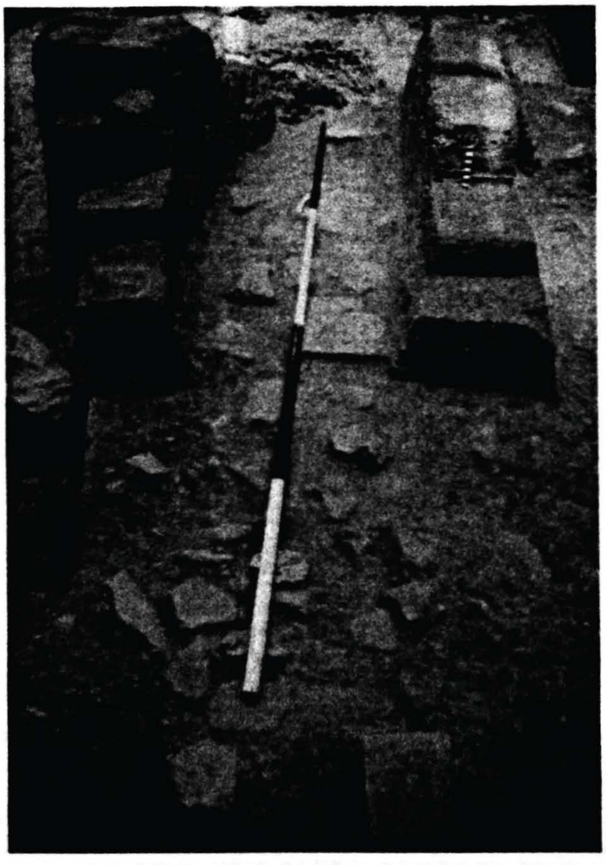


Fig. 95: Paving 450 (structural phase G5)

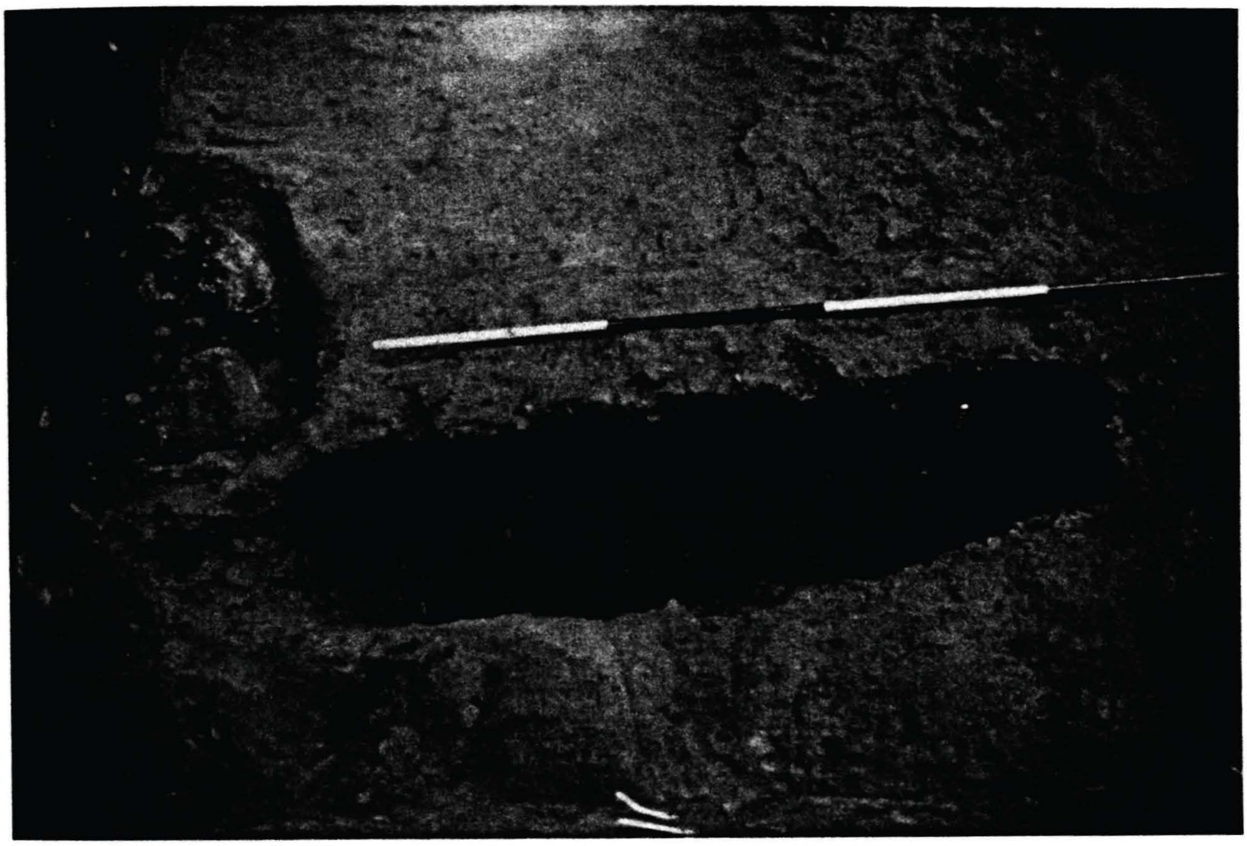


Fig. 96: Foundation pit 669 and slot 637 (structural phase G5)

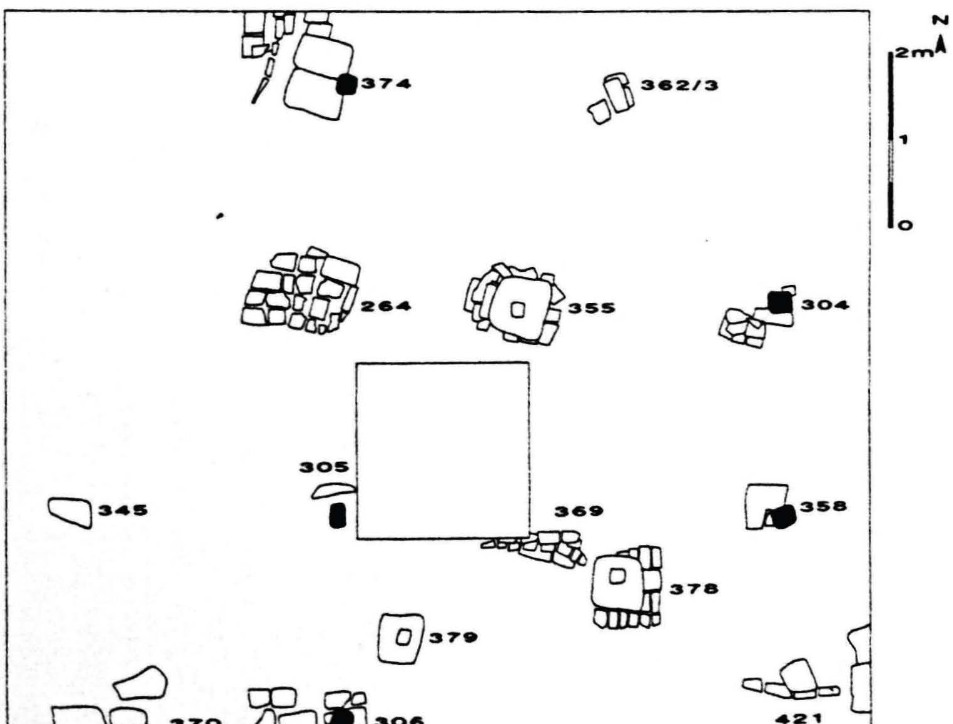


Fig. 97: Plan of pillar foundations (structural phase F)

Fig. 98: Pillar foundation 306 (structural phase F)

Fig. 99: Pillar foundation 306 (structural phase F)

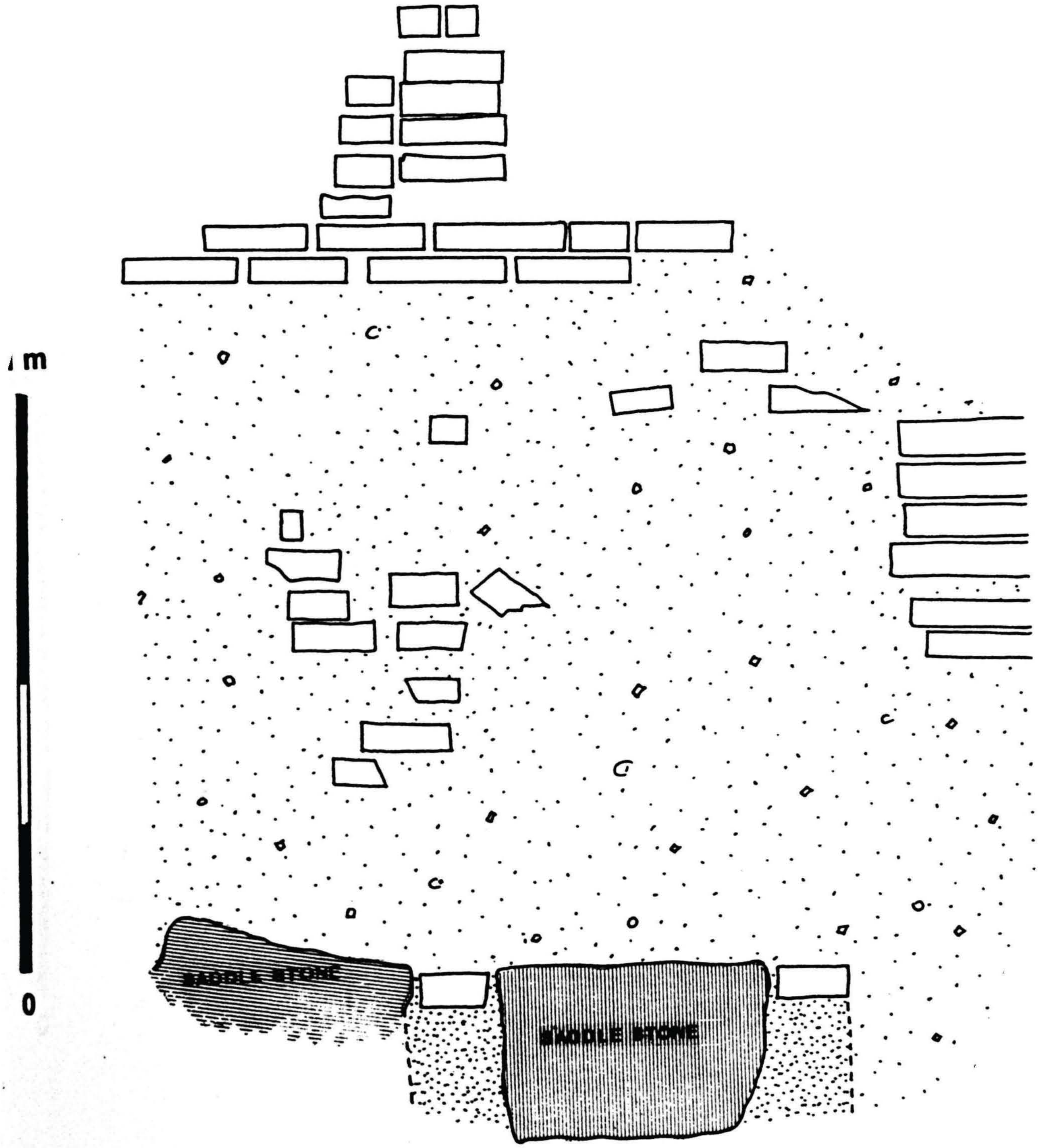


Fig. 100: Elevation of pillar foundation 370 (structural phase F)

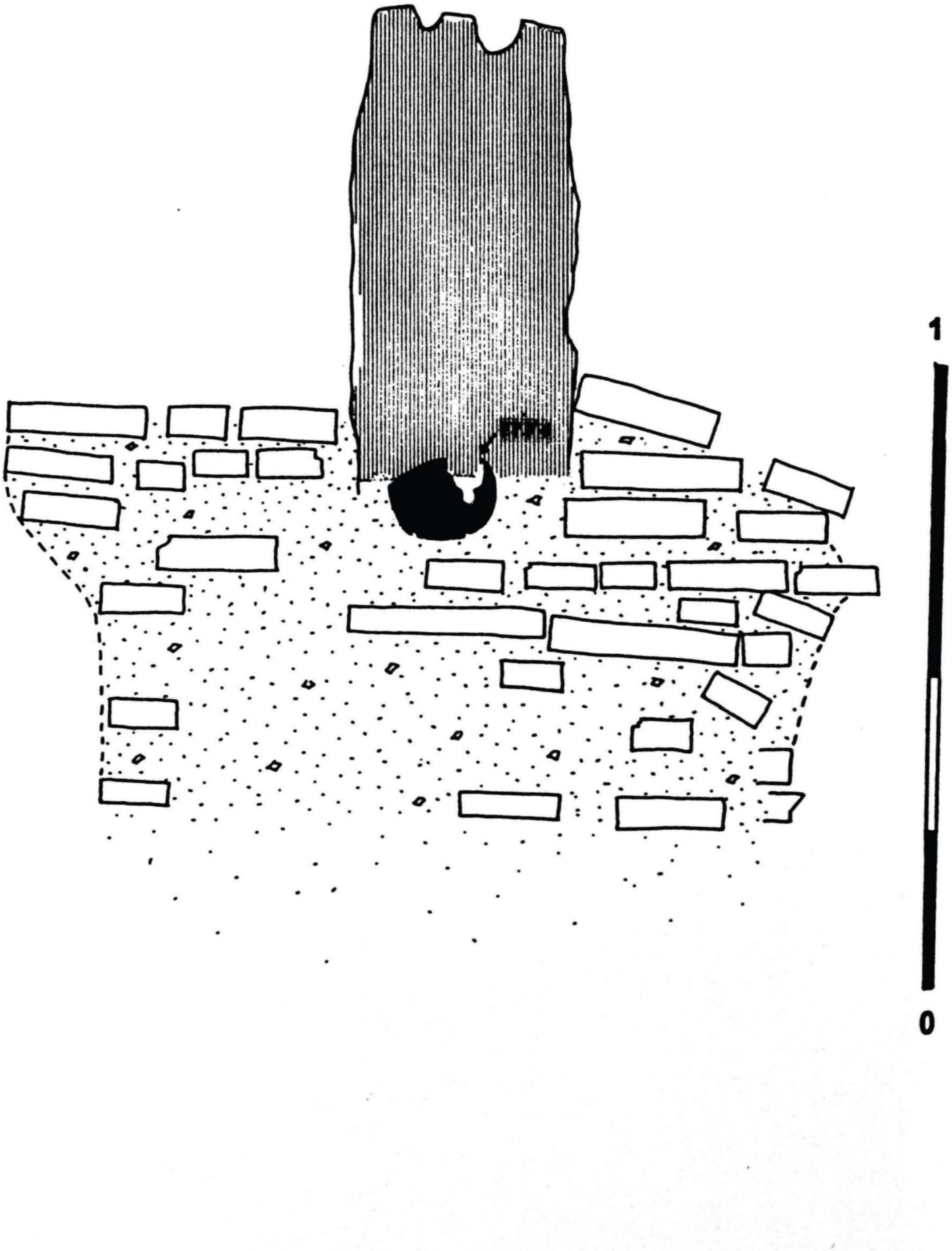


Fig. 101: Plan of pillar foundation 358 (structural phase F)

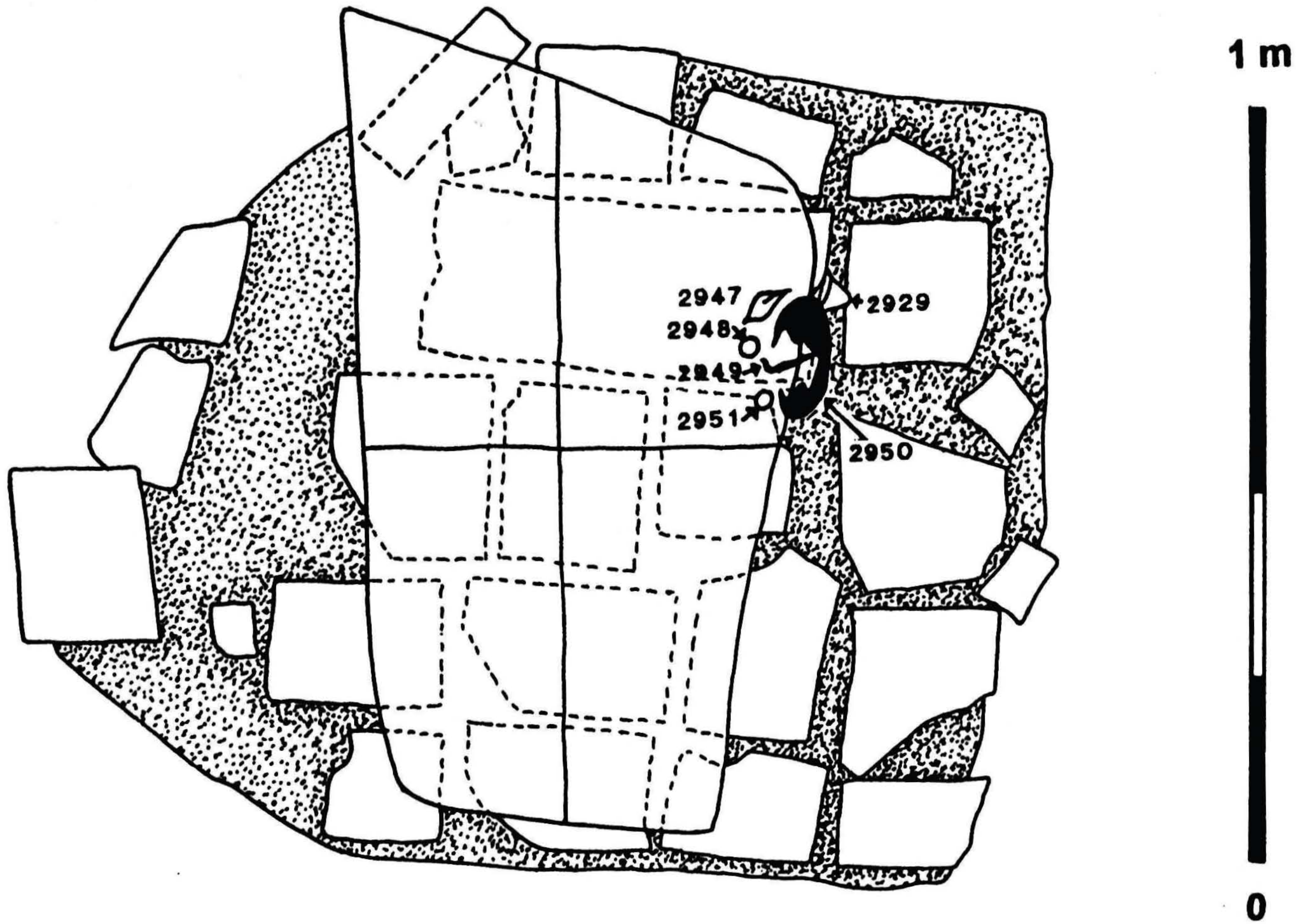


Fig. 102: Plan of pillar foundation 304 (structural phase F)

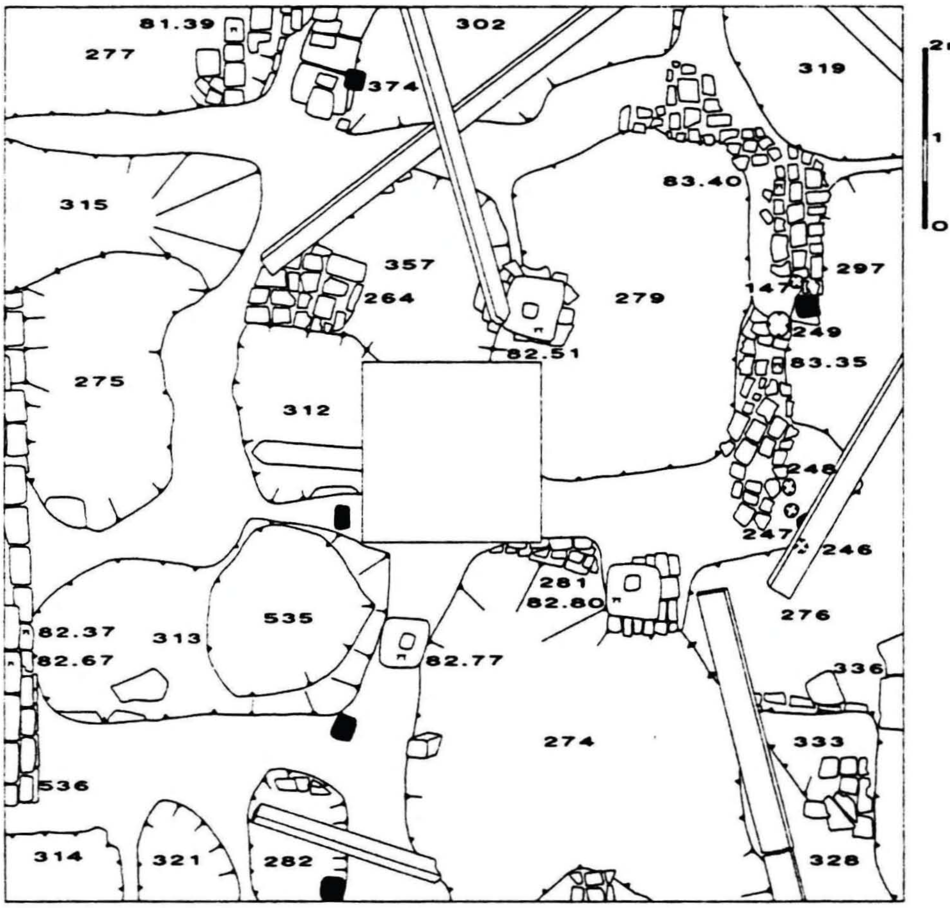


Fig. 103: Plan of structural phases D and E

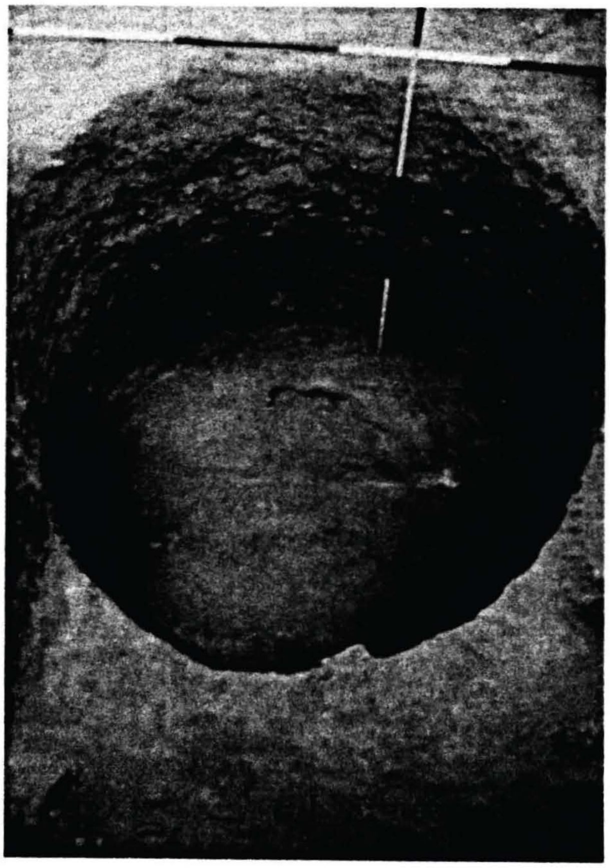


Fig. 104: View of base of pit 535 (structural phases D and E)

Fig. 105: Pit 274 (structural phases D and E)

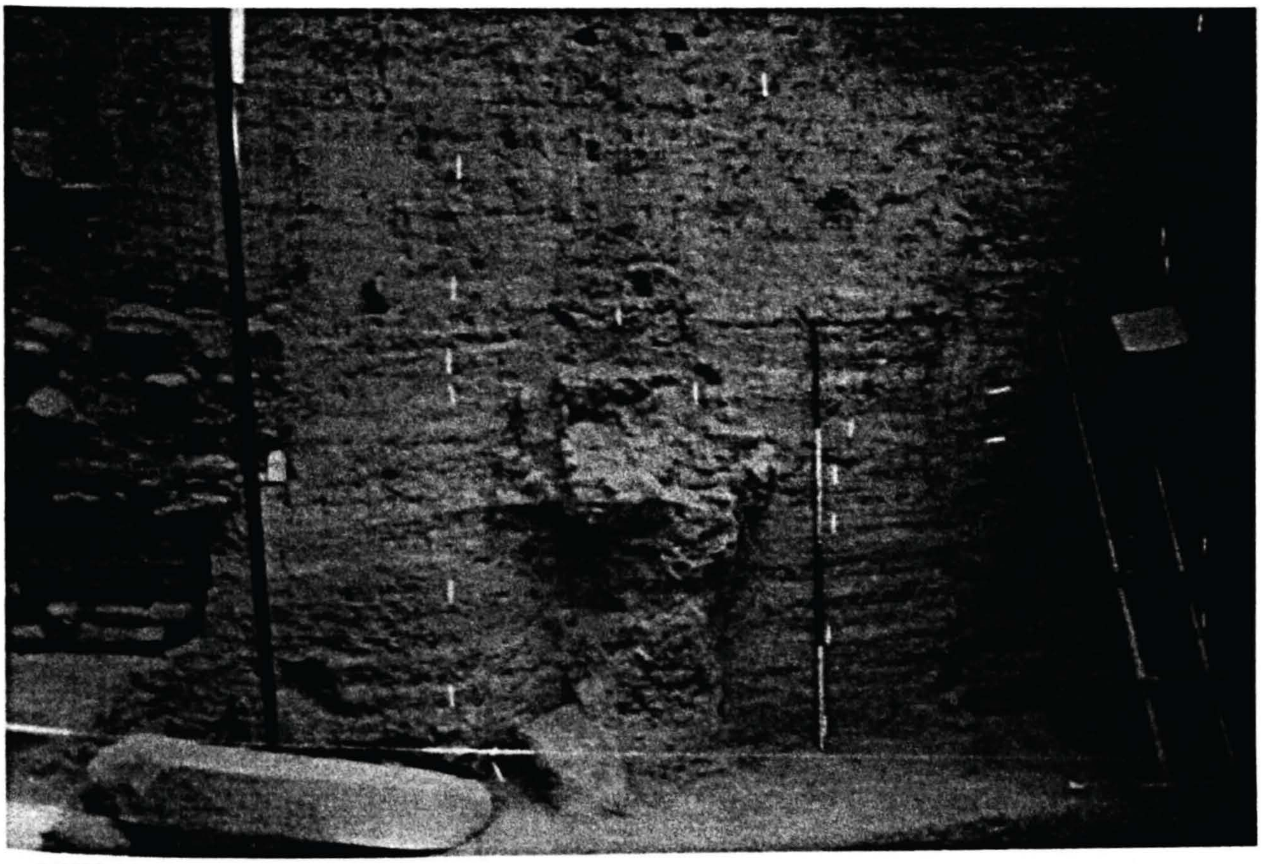


Fig. 106: Pit 274 (structural phases D and E)

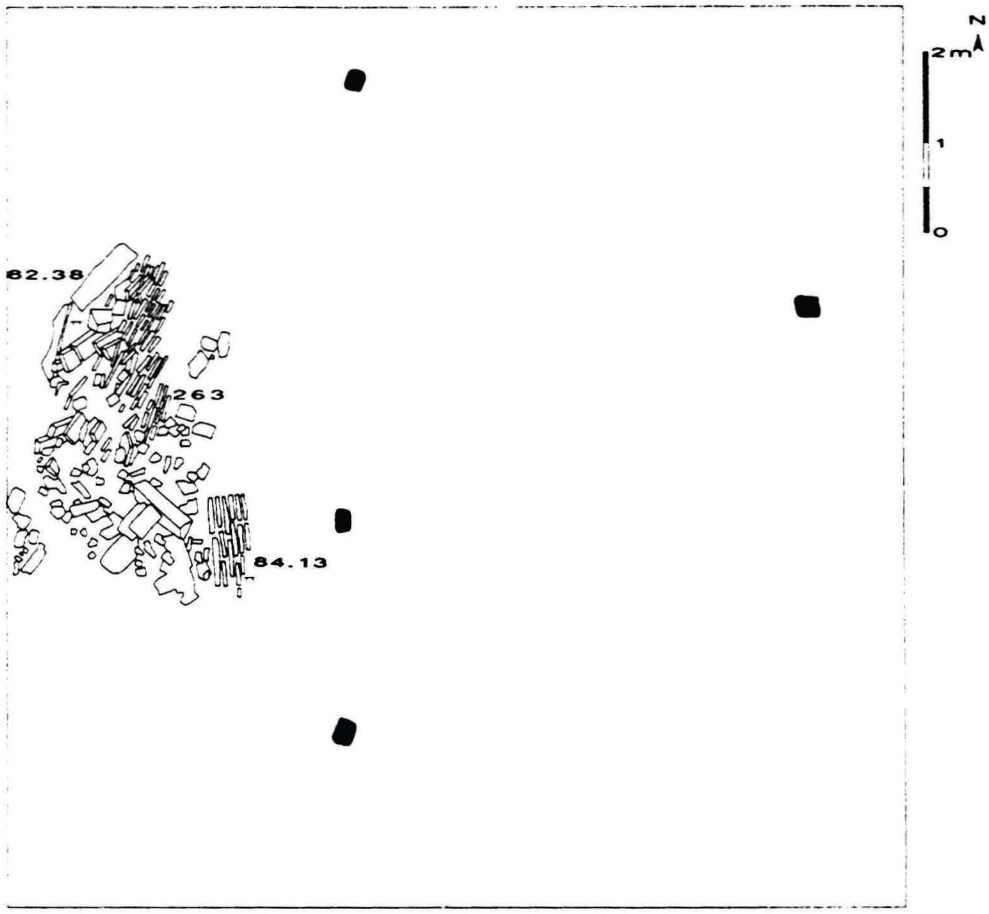


Fig. 107: Plan of structural phase C

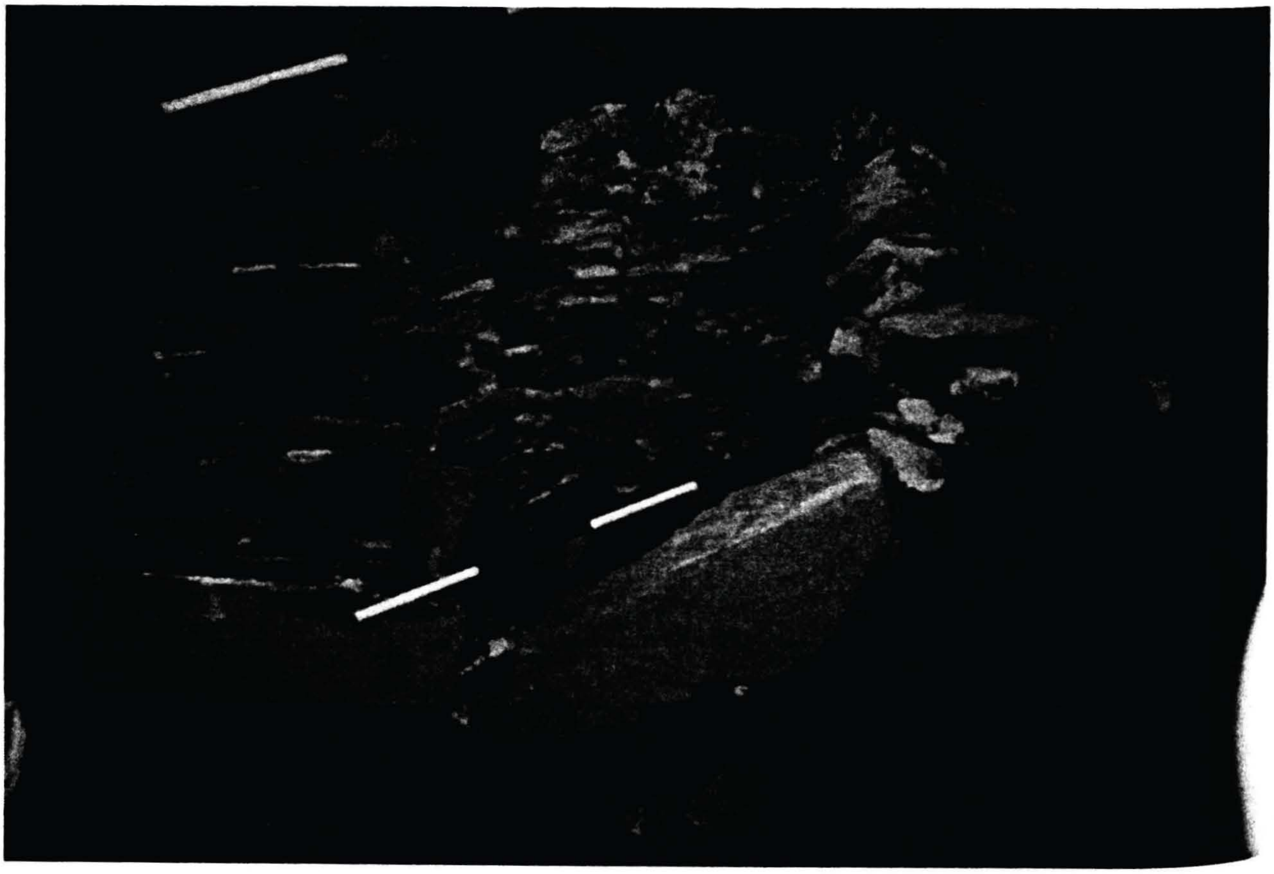


Fig. 108: Structural phase C

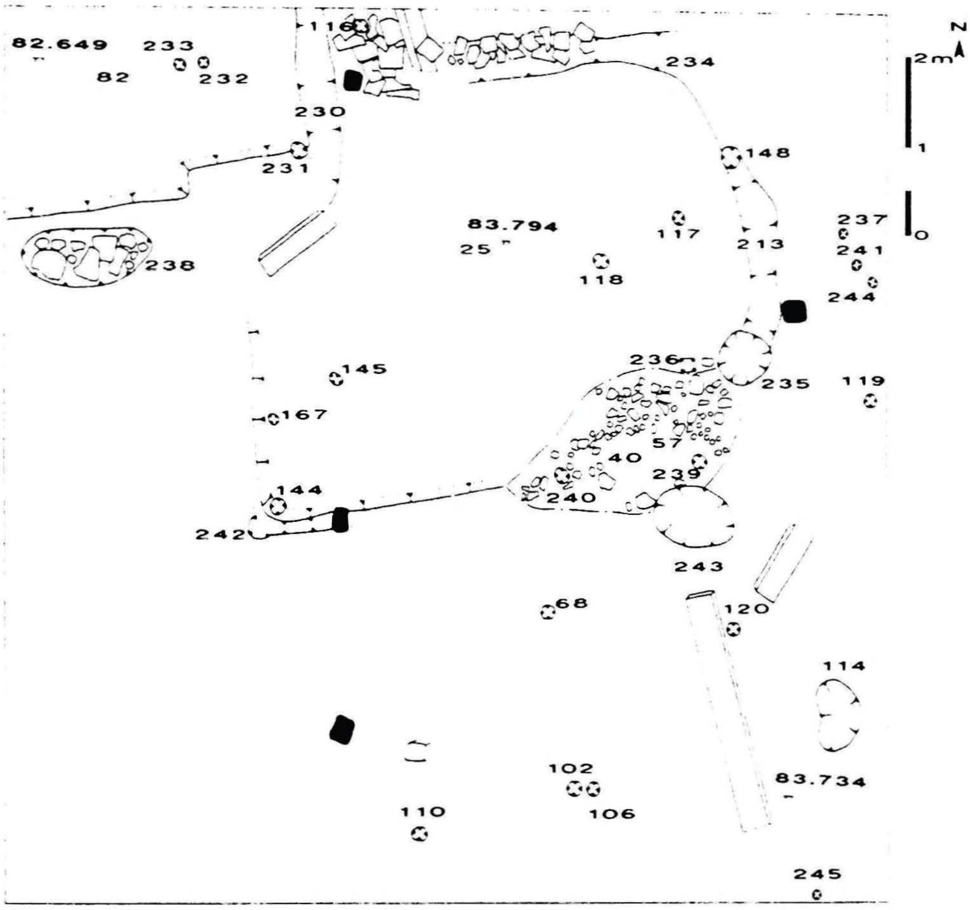


Fig. 109: Plan of structural phase B1

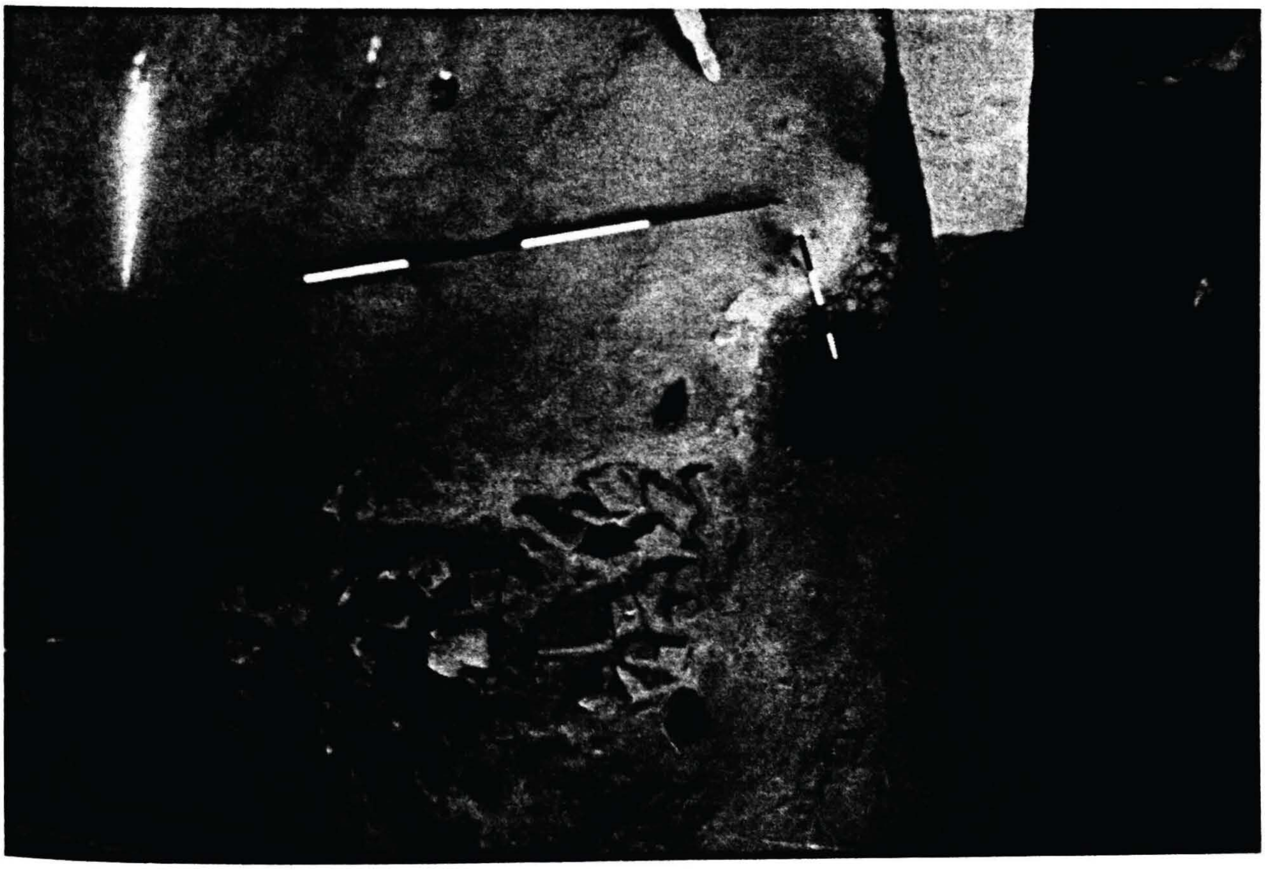


Fig. 110: View of southeast corner of structural phase B1

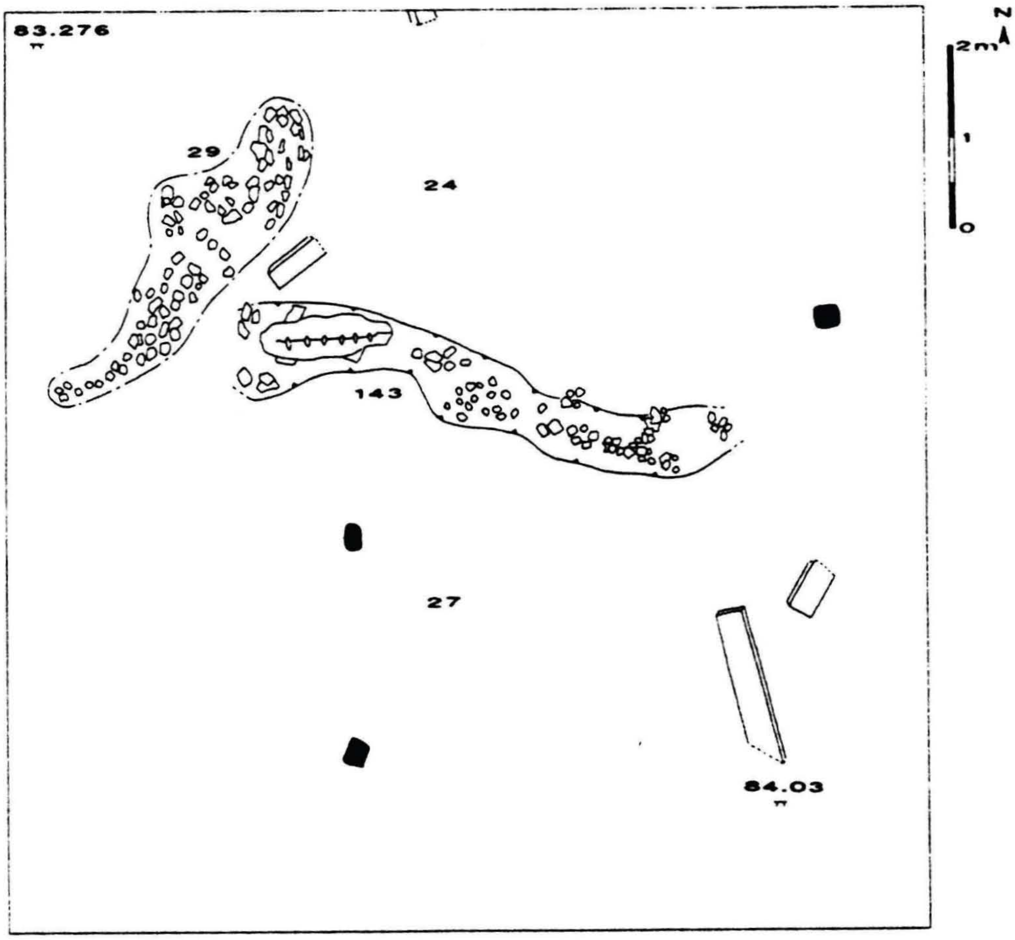


Fig. 111: Plan of structural phase B2

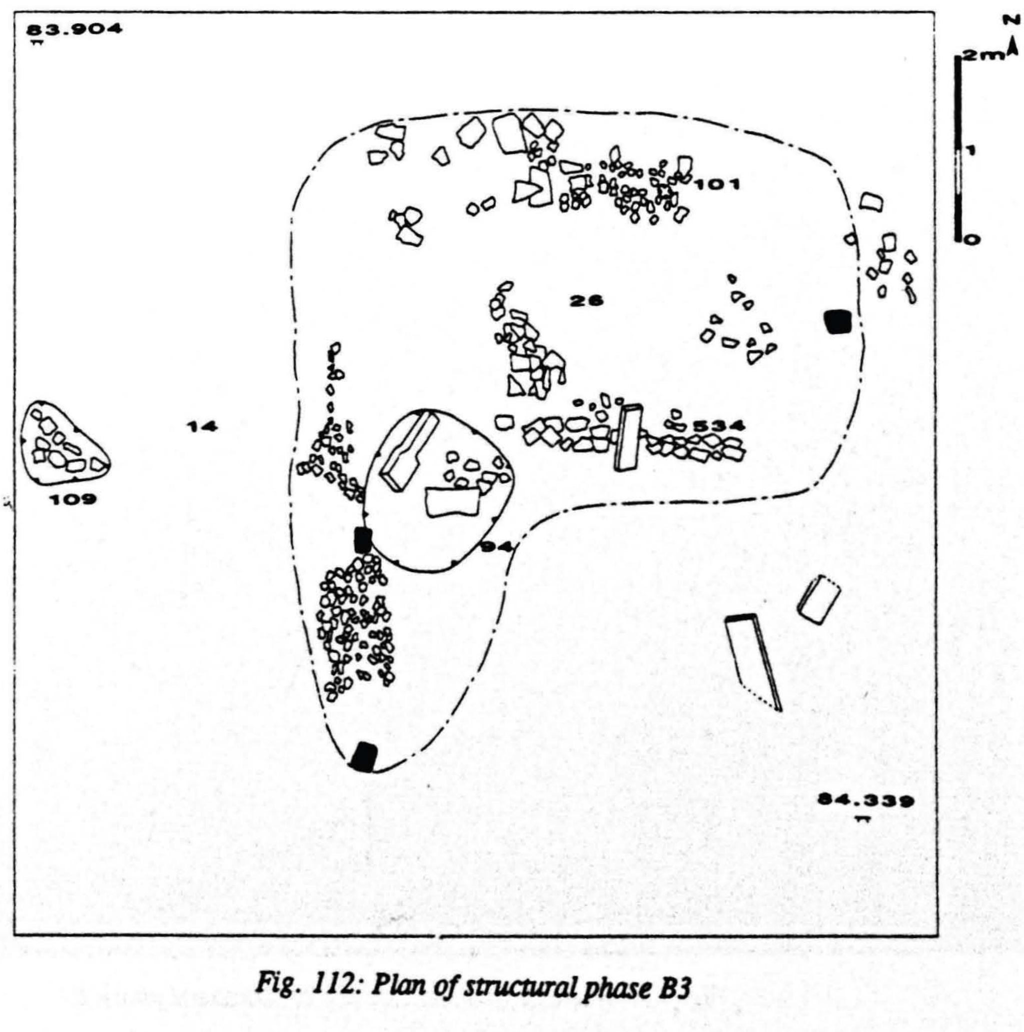


Fig. 112: Plan of structural phase B3

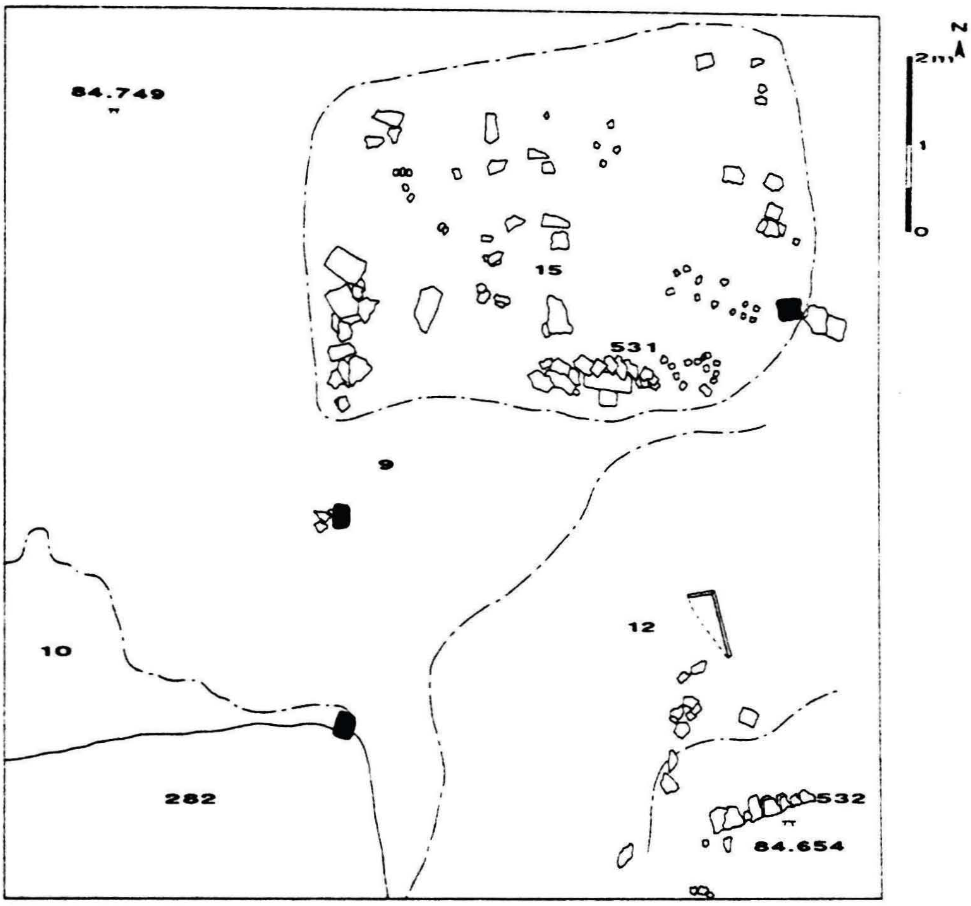


Fig. 113: Plan of structural phase B4

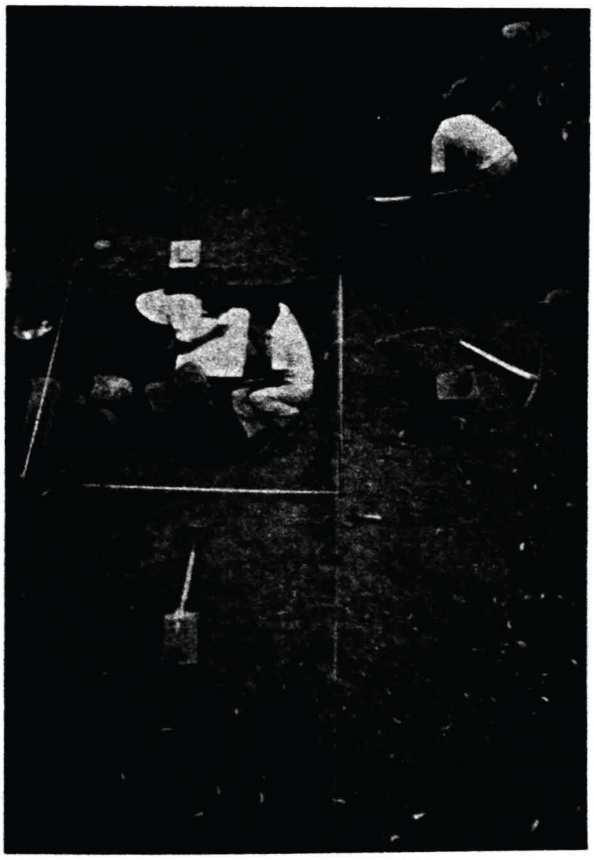


Fig. 114: Structural phase B4

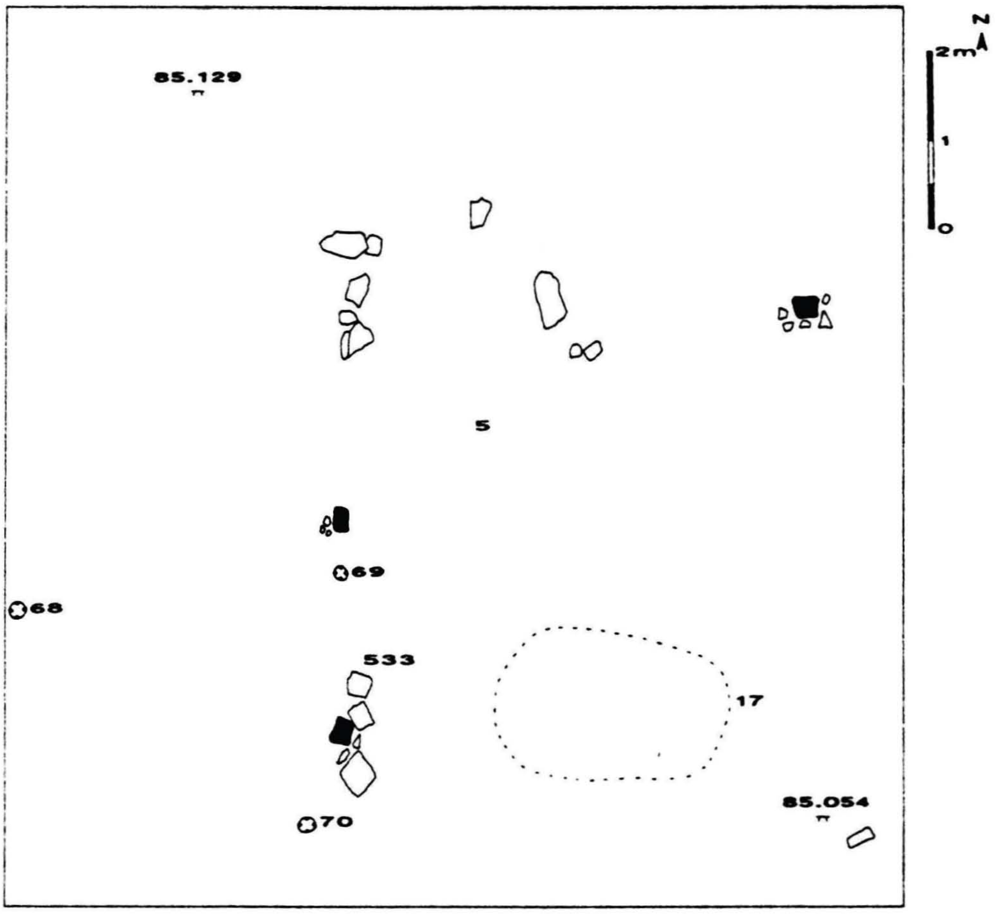


Fig. 115: Plan of structural phase B5

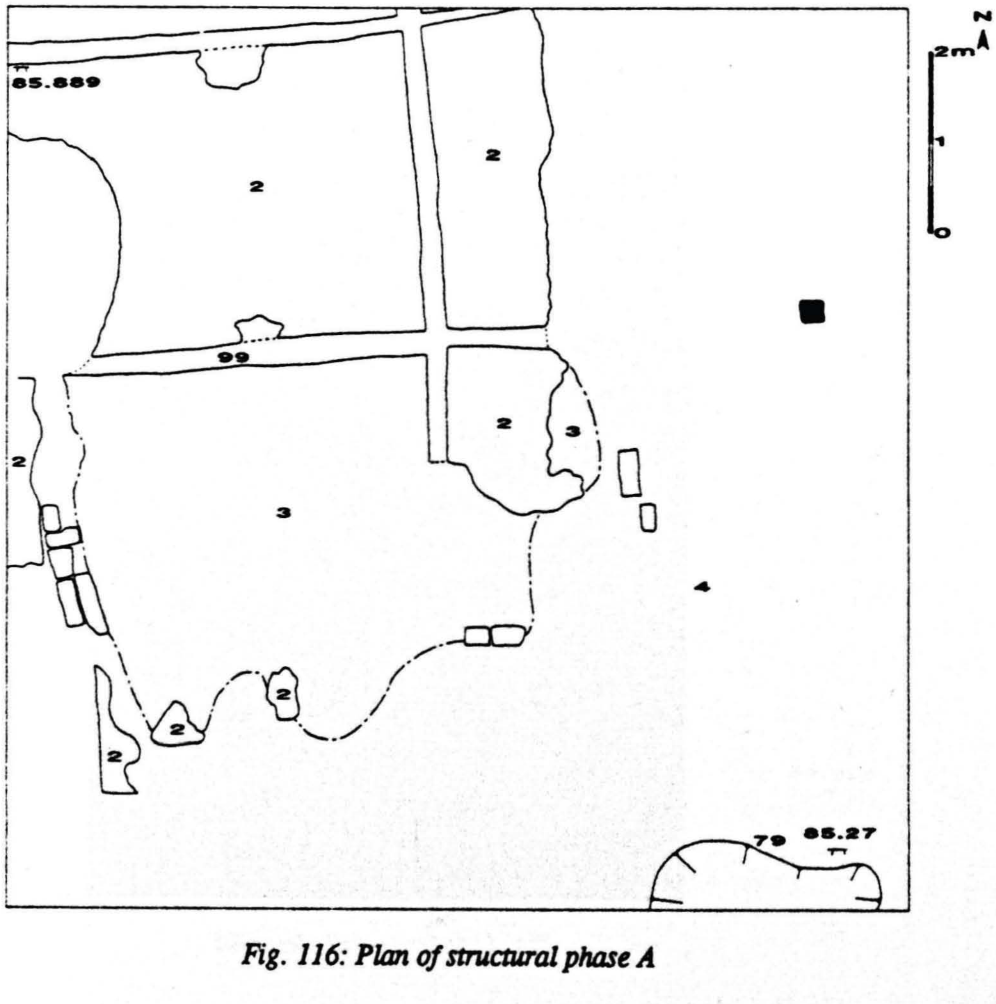


Fig. 116: Plan of structural phase A

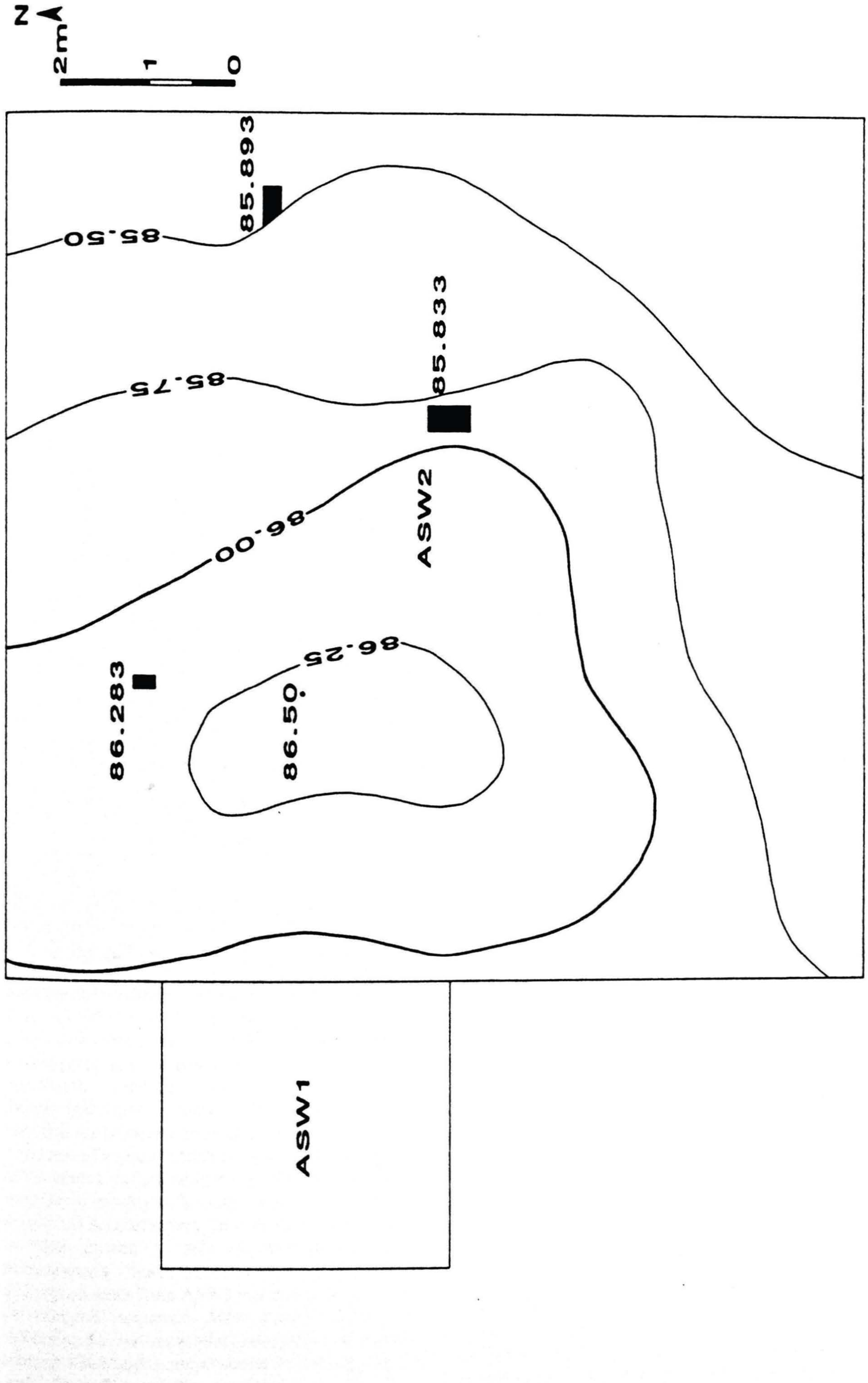


Fig. 117: Plan of the surface at ASW2 prior to excavation

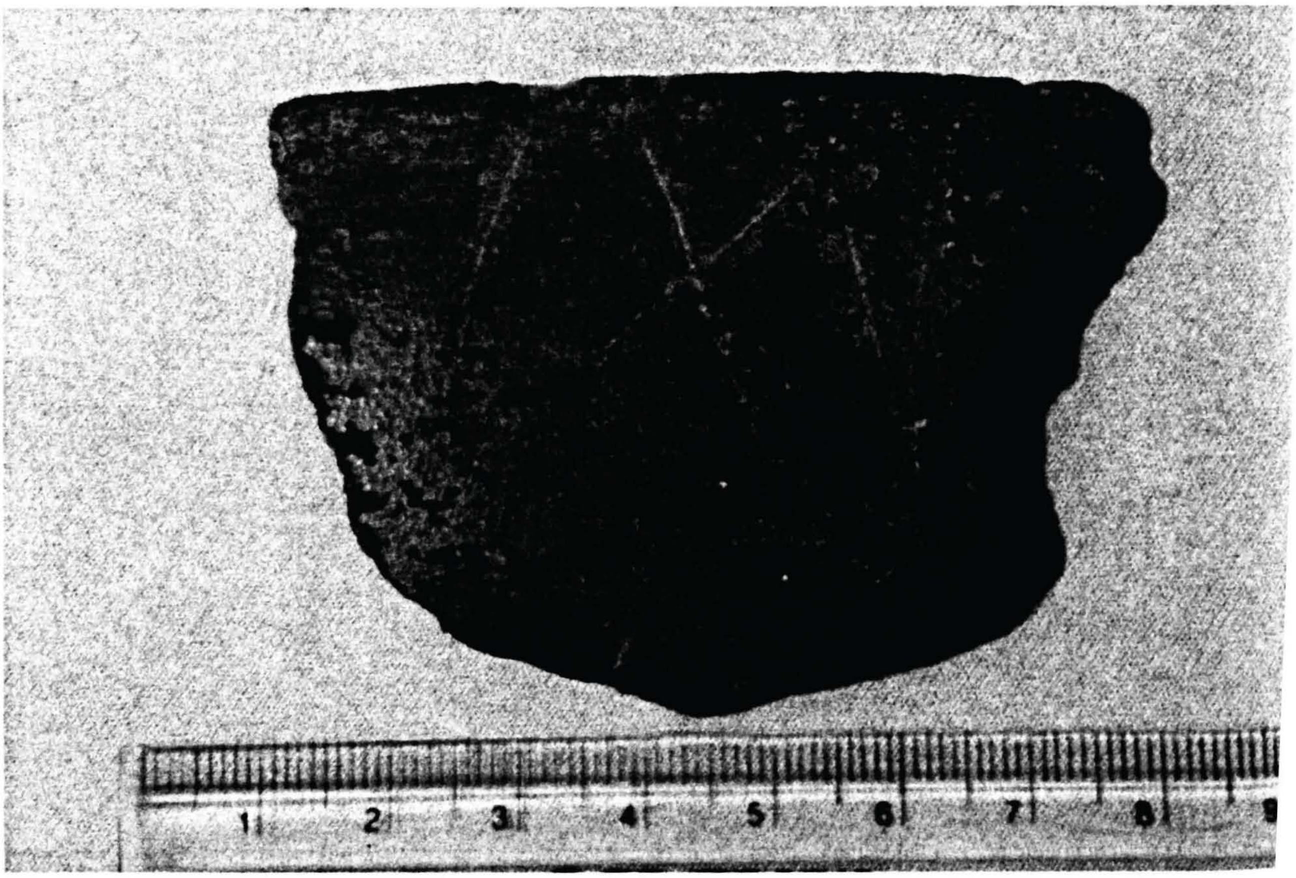


Fig. 118: Sf 17420 (structural phase J4)