THE AUNU'U ISLAND SEWER PROJECT

ARCHAEOLOGICAL SURVEY AND EXCAVATION

OCTOBER 1992

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ACKNOWLEDGEMENTS

I would like to thank the following for their assistance with the project -

In A.S.P.A.

Chris McPhee and Mike Dworsky, for help in all aspects of the survey.
Ioana Uli, for arranging accommodation.
Fat’i, for providing maps and advice on the survey line.
Ray Najera, of the Satala plant, for manufacturing an auger at short notice.

On Aunu’u

Chief Tautolo and Chief Lemafa, for accommodation and assistance.
Cliff Tautolo and Filipo Filipo, for help with the excavations.
Semeli Saole, for donating the two adzes found by him.

I would also like to acknowledge the help provided by the following -

Dave Herdrich, then Territorial Archaeologist for the American Samoa Government, and the Department of Parks and Recreation, Pago Pago, for support.

Colin Lehana, of McConnell Dowell Construction, for bringing a soil probe from New Zealand.

Russell Foster, of the Department of Conservation, Auckland, for arranging the above.

The Anthropology Department, University of Auckland, for assistance with the report production.
CONTENTS

ABSTRACT 1

INTRODUCTION 2

THE ISLAND 2

PREVIOUS WORK 4

THE ARCHAEOLOGICAL SURVEY AND TEST EXCAVATIONS 4
   The Survey 6
   The Excavations 6
   Excavation Summary 12
   Conclusion 15
   Recommendations 15

DATA RECOVERY AT AREA H1 16
   The Excavations 16
   Discussion 25
   Recommendations 26

FIGURES

1. Location map 3

2. Map of survey area 5

3. Sections of manhole excavations (units A, D, E2 & F). 10

4. Sections of manhole excavations (units F1, H, H1 & L). 11

5. AS-22-42: Flake tools from area of H1 13

6. AS-22-42: Two adzes found close to manhole H1 14

7. AS-22-42: Data recovery test excavation locations 17

8. AS-22-42: Test excavation sections (Units 1,2 & 3) 20

9. AS-22-42: Test excavation sections (Units 4 & 5) 21

10. AS-22-42: Test excavation plan and section (Units 5 & 6) 22

11. AS-22-42: Excavated stone tools 23
PLATES

1. AS-22-42: Potsherds in place, surface layer B, unit H1 19
2. AS-22-42: West face of Test Trench 4 19

TABLES

1. Artifact distribution 24
ABSTRACT

The route of a proposed sewer line through the village of Aunu'u on Aunu'u island was surveyed, and nine test excavations were carried out at selected locations.

One prehistoric site was found, and a data recovery programme for this undertaken. Six excavation units were placed along the proposed line at this location, and all cultural material excavated.

This report describes both stages of the project, and includes a short analysis of the excavated artifacts.
INTRODUCTION

The American Samoa Power Authority propose to install a sewer system for Aunu'u island, at the east end of Tutuila (Fig. 1). The main line for this runs approximately north-south along the back of the village, with four laterals, branching off west through the village itself, and three to the east to pick up the houses now being built on that side.

The initial archaeological survey was carried out between June 29 and July 3 1992. This consisted of a ground search along the line and up to 30' on either side, and a series of test excavations at selected locations. At the end of one of the eastern laterals (H1) potsherds and stone flakes were found; these also occurred in the plantations on either side of the line at that point.

An interim report was produced on July 7, and a data recovery programme proposed for the area. This was carried out between July 30 and August 4 1992. Six excavation units were opened up; at the proposed manhole site itself, and also back along the line, and excavated < 6" below the cultural material. An interim data recovery report was produced on August 6.

THE ISLAND

Aunu'u is a small volcanic island with the remnants of a central crater, and a fringing apron of sand stretching out for 1600 feet on the west side. The village is situated along the seaward edge of this, back to about 700 feet from the beach. A swamp, up to 600 feet wide, runs along the rear of the flats, up against the base of the crater walls. Inside the crater is another swamp, and the crater itself has been breached by the sea on the east side.

Stearns (1944) describes the village flats as having been formed by the currents sweeping round the island from the east, depositing sand on the western side. This or similar incremental processes in this region of the Pacific have often resulted in successive settlements moving away from their initial position back up against the inland hill slopes, following the migrating seaward edge of the beach.

The soil in this coastal strip is described as the Ngedebus mucky sand, with a natural vegetation of coastal forest, and capable of growing subsistence crops, such as bananas, breadfruit and coconuts (Nakamura 1984:15). The swamp at the rear of the coastal flats on Aunu'u is the largest in American Samoa, and grows what is described as the country’s best taro.

Drinking water was traditionally obtained by the same method as in coastal sites on other small islands in the Samoa group, such as Manua, from stone lined wells tapping into the Ghyben-Herzberg fresh water lens. On Aunu'u, despite the recent installation of a piped supply, most if not all of the households, at the time of the survey, were still drinking from the ground wells, and using the other for washing.
Figure 1. Location map of Aunu'u island, American Samoa. The survey area is along the rear of the village.
PREVIOUS WORK

The first individual to record an archaeological site on Aunu'u, in late 1927, was Sir Peter Buck. He described the remains of a defensive stone wall or pa taga, with a tower at both ends, which had been built along the seafront in the vicinity of the present wharf. Only one tower was apparently still visible, originally some 20' high but when Buck saw it "...nothing but a heap of stones" (Buck 1930:322). The wall, and presumably the towers also, had according to Buck been removed and re-used to build pigpens.

In 1961/62 W.K. Kikuchi visited the island in the course of his M.A. fieldwork, and recorded 5 sites. One of these was the wall, traces of which could still apparently be seen even at that late date (Kikuchi 1963:47). The other sites recorded by him were the village itself, a well, and two pairs of 'spirit stones' or tupua.

In 1975, T. Silva and S. Palama conducted an archaeological survey for a proposed boat harbour on Aunu'u, but reported no new sites. In 1980 J.T. Clarke also visited the island in the course of compiling a site inventory for American Samoa, with the same result (Clarke 1981). In 1991, however, Clarke returned and noted the presence of prehistoric ceramics in two excavations, put down by A.S.P.A. while testing for a well site; these were situated on the flats behind the north end of the village.

THE ARCHAEOLOGICAL SURVEY AND TEST EXCAVATIONS

Equipment: No survey equipment as such was needed, as the line ran through the village and visibility was always excellent. A 1" to 100' topographic base map (from 1990 aerial photography), was provided by A.S.P.A., with the proposed sewer lines marked in (Fig. 2). The identifying letters for the manholes are taken from a later working version of this map, save for manhole H1 which was applied to the manhole at the end of the lateral running east from manhole H.

Excavating equipment consisted of a spade, square-mouth shovel, and trowel, and also an auger and probe. The auger, manufactured at A.S.P.A.'s Satala plant, retrieved a 2" core about 16" in length. The soil probe was a four foot length of half inch stainless steel, with a ¼" groove down the side. This, when driven down into sand at the base of an excavated unit, produced a 4' column sample. All material excavated was sieved through a ¼" mesh screen.
Figure 2. Aunu'u village, with proposed sewer line route, and manhole identification.
THE SURVEY

This examined a 30' wide strip on both sides of the proposed sewer line for surface evidence of buried sites. Many present day village sites in this area of the Pacific are built on beach flats that have been occupied for many hundreds of years. When this happens everyday activities, such as tree planting, digging rubbish holes and wells, excavating foundations etc., will bring to the surface prehistoric artifacts. On Aunu'u, the survey did not locate any prehistoric material along the main line, or within the village itself to the west. At the end of one of the laterals to the east however, at proposed manhole H1, stone flakes and one potsherd were found in the banana plantations on either side of the line.

THE EXCAVATIONS

Nine test holes were excavated, at the locations of proposed manholes A,D,E2,F,F1, H,H1,J, and L. It was originally intended to test all manhole positions, however the difficulty of digging through coral filled deposits, some of which were cemented and required the use of a crowbar, together with time constraints, resulted in a sample only being obtained. The cover is considered to be adequate, considering the relatively simple stratigraphy and the similarity of the deposits over wide areas.

Stratigraphic layers were followed wherever possible, with arbitrary levels within these. The spade and square-mouth shovel were the main excavating tools, together with the crowbar where necessary.

A summary of the excavations follows; the section drawings are shown in figures 3 and 4.

Test Unit A

An 18" square unit, sited beside proposed manhole A. Excavated to a depth of 4' 3" (Fig. 3). No cultural material was found.

Stratigraphy

Layer A. White sand and coral, up to 8" in depth, under a turf and brown sand topsoil 2" deep. The coral was flat and up to 6" in diameter.

Layer B. Black-brown sand and coral, 8" in depth. Some charcoal present

Layer C. Brown sand and coral, 12" in depth. The brown colour probably results from humus leaching from Layer B.

Layer D. White sand and coral.
Test Unit D

A 3' square unit, sited 3' south-east of manhole D (Fig. 3).

Stratigraphy

Layer A. Black sandy soil with coral, up to 6" in depth. Some metal and glass.

Layer B. Brown sand with some coral, up to 8" in depth. No cultural material.

Layer C. White sand, very little coral. No cultural material.

A 16" square test hole was dug in the south-east corner of the square to a depth of 3'9". The auger was then put down for another 12". Clean white sand was found all the way, and water was encountered at the base (at 4.30 p.m.). The probe was then put down to a depth of 6'3" below ground level. Again white sand was encountered.

Test Unit E2

A 3' square unit, sited next to manhole E2. This was at the west end of a lateral line through the village, about 150' from the beach (Fig. 3).

Stratigraphy

Layer A1. A white sand with some small coral, 4" deep. Metal and glass present, and also one basalt flake (lacking evidence of being deliberately struck).

Layer A2. A slightly greyer sand and coral, cemented, with more basalt flakes, again probably not prehistoric. No European material. Depth up to 5".

Layer B1. A grey sand and coral layer, up to 4' in depth. Again cemented, with no European material.

Layer B2. A cemented layer of white coral, up to 4" thick, disturbed in the north east corner by a feature. One piece of glass found in this.

Layer C. A black/brown sand layer, up to 6' deep. One piece of plastic in this layer, but on the edge of a feature.

Layer D. A black gravelly layer of small coral fragments, 15" deep. No cultural material.

Layer E. A cemented layer of white coral, up to 10" deep. This was present only in the north half of the square.
Layer F. A black/brown sandy soil, up to 16" deep. Three large fire-blackened rocks were found on the surface of this layer. A piece of plastic was found lying on the excavated surface. The presence of similar plastic on the ground surface around the unit would suggest that this piece had fallen in.

Layer G. White sand and coral, excavated to 5" below ground level.

A 14" square test hole was then put down in the north-west corner, and excavated for another 10". The probe was driven down in white sand for another 3'4", to a depth of 9'3" b.g.l. Water was encountered at 8'11" b.g.l. (at 4.0 p.m.).

Test Unit F.

A 2'x 2' unit, sited 11' south of manhole F, in order to be off the village path. Excavated to a depth of 3'7" (Fig. 3).

Stratigraphy.

Layer A. Grey sand containing small coral, 5" deep; the modern day dressed surface.

Layer B. Black charcoal stained sand, no coral, 5" deep.

Layer C. White sand, no coral.

The unit was then probed to a depth of 7'4" below ground level, with the same white sand to that depth.

Test Unit F1.

A 3' x 3' unit, at manhole F1 (Fig. 4).

Stratigraphy.

Layer A. Black/brown sand and coral, with some European material. Depth 11".

Layer B. Soft white sand. In the south-west and north-west side of the unit two features were encountered, each containing a dog skeleton. With one of these was a piece of plastic and fragments of blue painted wood. Depth excavated was 18"

A 12" square test hole was then dug in the north-east corner of the unit, to the top of a cemented layer of the white sand, at water level. The auger was used to get down to 5' below ground level, in cemented sand and water all the way. The probe was driven down another 1'10" below that, however water removed the sample.
Test Unit H.

A 3' x 3' unit by manhole H (Fig. 4).

Stratigraphy

Layer A. Black sandy soil, 4" deep, with European artifacts, including a 1951 one cent piece. Also in the layer was one basalt flake, which may have been deliberately flaked.

Layer B. Brown sandy soil with some small coral, 8" in depth, containing one nail. Two features were cut from this level into layer C to a depth of 8"; one 18" in diameter and the other 20".


Layer C. White sand, excavated to a depth of 2'10".

A 16" square test hole was then dug for another 12", and the probe driven down to 7'2" below ground level. White sand was found to that depth, and water was encountered at the 8'5" mark.

Test Unit H1.

A 3' x 3' unit c. 6' north of manhole H1 (Fig. 4).

Stratigraphy.

Layer A. Black sandy soil with small coral, 5½" deep, containing European artifacts and a prehistoric potsherd, the latter found at the interface between this and layer B, in the north-east corner.

Layer B. Brown sand and coral, 12" deep. Thirteen prehistoric potsherds were found; 5 of these were parts of one sherd that had broken in position in the south-west corner.

Layer C. White sand with some coral. Excavated to 3' below ground level, and then a 16" square test hole dug in the north-east corner for another 9". Hard cemented sand was encountered, with the water level at 3'4" b.g.l. (at 5.20 p.m.).

The auger was put down to 4'6" b.g.l., where a hard pan was encountered that could not be penetrated.
Figure 3. Sections of manhole excavations, units A, D, E2, F.
Figure 4. Sections of manhole excavations, units F1, H, H1, L.
Test Unit J.

A 2'6" x 2' unit, at manhole J. No cultural material was found.

Stratigraphy.

Layer A. Fine black sandy soil and coral, 12" deep.

Layer B. Brown sand and coral, 4" deep.

Layer C. White sand and coral, excavated to 3'9" b.g.l.

The auger was then used to core down another 1'5". Fine white sand was encountered all the way, with the water level 4'7" b.g.l. (at 4.45 p.m.). The probe was driven down to 7'3" b.g.l., still in white sand.

Test Unit L.

A 2'x 1'8' unit, sited at manhole L (Fig. 4). No cultural material was found.

Stratigraphy.

Layer A. Fine black sandy soil and coral, 5" deep.

Layer B. Brown sand and coral, 5" deep.

Layer C. Fine white sand, some coral, 12" deep.

Layer D. Grey sand and coral, 7" deep.

Layer E. Fine white sand. Excavated to 3'4" b.g.l.

The auger was put down another 15" in the same material, with the water level encountered at 4' b.g.l. The probe was driven down, in the white sand, to 7'3" b.g.l.

EXCAVATION SUMMARY

The only prehistoric material found during both the survey and test excavations was at proposed manhole H1 and in its immediate vicinity (Fig. 5). In addition, two adzes were obtained that had been found by the owner of the land some 30' from the excavation while digging foundations for his house (Fig. 6). A brief survey behind the village found prehistoric flaked stone material in a zone running parallel to the beach, which started at about the ends of the two lateral lines F1 and H1, and ran back to the edge of the Tafusitele swamp.
The few possible stone flakes from other test holes may indicate that some prehistoric activity took place further towards the beach, although it is just as likely that the flakes may either be natural or have arrived at that part of the site through other agencies.

The five excavations along the main sewer line, units A, D, F, H and J, and the two at the ends of the east lateral lines, units F1 and H1, showed that only one occupation layer was present. This was the A layer, a black humus and charcoal rich deposit, usually containing European artifacts. The B layer, a brown sand and coral, is taken to have been formed mainly by staining from the overlying layer, although activities would also have taken place within this.

At unit L, close to the beach on the south side of the village, a second and lower layer was found, separated from the top occupation by 12" of sand and coral. Although no artifacts were found, the grey colour of this layer indicates that at some stage it supported vegetation, and it seems likely that it represents an earlier ground surface, when the beach was closer in.

The only other unit excavated close to a beach was E2, and this had evidence for four earlier ground surfaces, the lowest of which was some 4' below the present day surface. Again none of these contained any prehistoric material.

Figure 5. Flake tools from surface collection in area of manhole H1. a:H1 Sur(1) b:H1 Sur(2)
Figure 6. Two adzes found by Semell Saole, while digging foundations for his house next to manhole H1.
CONCLUSION.

The results of both the survey and the test excavations indicate that there was little or no prehistoric settlement within the area of the present day village. Although some activities must have taken place there before the arrival of the first Europeans, they were either not of a type, or concentrated enough, to show up in the admittedly very superficial test excavations. Oral tradition in the village today suggests too that the front part of the beach was not used for settlement in late prehistory.

RECOMMENDATIONS

Excavations for the sewer pipeline through the main part of it's length therefore should not disturb the remains of any extensive and concentrated prehistoric activity. It may well however encounter smaller isolated features such as ovens, or even graves; if the later should happen then the relocation or otherwise of the remains should be decided in consultation with the villagers.

A data recovery programme for the length of proposed line to the H1 manhole was recommended on 7 July, and was approved on 28 July. The following section of the report covers this stage.
DATA RECOVERY AT AREA H1

This was carried out between 30 July and 4 August 1992, and involved the excavation of six units.

The excavation units: A string was stretched between the survey pegs for manholes H and H1, and used as the centre line for the units. The proposed trench for an 8" pipe is normally no wider than 2 feet, and excavation units of twice this width were considered to cover any deviation from the line.

The excavations started at the manhole, and worked towards the main sewer line running along the back of the village (Fig.7). All excavation was by trowel, and all material was screened through a ¼" wire mesh. The excavation units were dug up to 6" deeper than the base of the cultural deposit.

The following is a summary of the excavations themselves. The section drawings are shown in Figures 8-10, and the artifacts listed in Table 1.

THE EXCAVATIONS.

Square 1.

A 6'6" square unit centred over manhole peg H1 (Fig. 9).

Stratigraphy.

Layer A. Black sandy soil with coral, < 7" deep, with a thin grass turf. Contains both historic and prehistoric material; glass, potsherds and stone flakes.

Layer B. Brown sand and coral, < 3" deep. Four potsherds recovered.

Layer C. White sand and coral, excavated for c. 4". No cultural material.

The north west corner of the square was truncated by a water pipe, and a small balk was left unexcavated.

Trench 2.

A 6'6" x 4' unit centred over the midline (Fig. 8). This unit contained a water pipe running diagonally across from north-east to south-west, in a 12' wide trench 8" deep. The unit was excavated on either side of this.
Figure 7. Site AS-22-42: Data recovery excavation locations.
Stratigraphy.

Layer A. Black sandy soil with coral, < 7" deep, with a thin turf. One piece of glass was recovered.

Layer B. Brown sand and coral, < 3" deep. No cultural material.

Layer C. White sand and coral, excavated for c. 4". No cultural material.

**Trench 3.**

A 6'6" x 4' unit, over the midline (Fig. 8).

Stratigraphy.

Layer A. Black sandy soil with coral, < 8" deep. Contained both historic and prehistoric material; glass, plastic, etc., and potsherds, an adze fragment, and some flaked stone (Fig. 11a).


Layer B2. A discontinuous lens of brown sand, < 2" thick. This occurs only in the north-west corner of the unit, where it dips down from the base of B1.

Layer C. White sand and coral, excavated for c. 12". No cultural material.

**Trench 4.**

A 6'6" x 4' unit, over the midline (Fig. 9).

Stratigraphy

Layer A. Black soil; sand and much coral, < 9" deep. Glass, metal, and plastic, also a small stone adze or scraper (Fig. 11b).

Layer B1. Brown sand and coral, < 6" deep. An adze fragment, a stone flake and a potsherd found.

Layer B2. A lens of brown sand, in the east part of the unit.

Layer C. White sand and coral, excavated to a depth of 4". No cultural material. Three features dug from layer B.

Plate 2. Site AS-22-42: West face of Trench 4, showing lowest occupation lens.
Figure 8. Site AS-22-42: excavation sections, units 1,2,3.
Figure 9. Site AS-22-42: excavation sections, units 4,5.
Figure 10. Site AS-22-42: excavation plan & section, units 5,6.
Trench 5.

A 6'6" x 3'3" unit, over the mid line (Fig. 9).

Stratigraphy.

Layer A. Black soil; sand and much coral, < 9" deep. European material in top 2".

Layer B. Brown sand and coral, < 6" deep. Some disturbance, with white sand from Layer C in the matrix. No cultural material.

Layer C. White sand and coral. Five features had been dug into this, from both layers B and A (Fig. 10). No cultural material. The unit was not excavated further.

Trench 6.

A 6'6" x 3'3" unit, over the mid line (Fig. 10).

Stratigraphy.

Layer A. Black soil; sand with much coral, <8" deep. European material in first 4".

Layer B. Brown sand and coral, < 4" deep. One potsherd found.

Layer C. White sand and coral, excavated to a depth of < 6". No cultural material, but contained a large feature dug in 10" from layer B (see Fig. 10).

Figure 11. Site AS-22-42: excavated stone tools. a: Trench 3 lyr A2, b: Trench 4 lyr A3.
<table>
<thead>
<tr>
<th>Excavation Unit</th>
<th>Layer</th>
<th>Sherd</th>
<th>Glass</th>
<th>Metal</th>
<th>Plastic</th>
<th>Stone flake</th>
<th>Adze/tool</th>
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<tbody>
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<td>B2</td>
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<td>Trench 3</td>
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<td>Trench 4</td>
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<td>1 frag</td>
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<td>18+</td>
<td>3+</td>
<td>2</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>TOTAL</td>
<td>B</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1. Site AS-22-42: Artifact distribution.
DISCUSSION

One hundred and sixty two square feet of the site was excavated over a 36' length of the proposed sewer line. The stratigraphy was similar to that encountered in the manhole test excavations, both in composition and depth. The lens of B material dipping down in the west end of Trench 3 and the east end of Trench 4 indicates that the beach may have been closer at that time.

The horizontal and vertical distribution of the artifacts (Table 1) provides some indication of the settlement of the area.

1. The distribution of the pottery, which may be some 2000 years old, differs from that of the worked stone material, which may be younger. The pottery is concentrated in the area of the manhole itself, with 69% of the sherds coming from Unit H1 and Square 1. The pottery also occurs mainly in the B layer and the lowest A layer, with 83% coming from these.

2. Most of the worked stone material (81%) on the other hand, is in the A layer, and occurs further to the west, only one probable flake being found in the area of the pottery concentration, (although the sample is small).

3. None of the European material was found in the B or C layers.

It seems likely then that the pottery belongs to an occupation at the A/B surface or up to some 4" below this. The few sherds above this are likely to have been brought up by the features dug through from layer A. The date of this early occupation, which took place on a ground surface some 12" lower than the present is not known, but may have been some 2000 years ago.

At that time the beach would have been closer, as is shown by the 8" or so of white sand and coral over the lens of layer B in Trenches 3 & 4. With the progradation of the flats, and the movement of the beach away from the site area, deposition of coral and sand would have been restricted both to the rare natural event, for example storm waves, and to cultural processes such as the laying of clean coral sand around settlements. Thus the A layer represents a considerable time depth, and contains both historic and prehistoric artifacts.
RECOMMENDATIONS

AS-22-42 is one of the few ceramic sites yet discovered in American Samoa, and as such is of considerable importance in adding to an understanding of the early end of the occupation sequence for the islands. Some care should therefore be taken when running the sewer line through the area around manhole H1.

1. Trenching work on the lateral sewer line in the vicinity of the manhole should be undertaken with care, and the excavation trench kept to the minimum width possible. Since prehistoric settlement also took place near the present surface, as indicated by the stone tools in layer A, shallow off-line disturbance in the immediate area should also be avoided if possible.

2. The 4" pipes connecting the house toilets to manhole H1 should be laid with caution, as these will pass through what appears to be a more concentrated part of the prehistoric occupation.

Since the site is less than an hour's travel from Pago Pago, it is recommended that if possible an archaeologist from the Department of Parks and Recreation examine these trenches before the pipe is laid, in order both to check for artifacts, and to look for dateable material in features cut from the B layer, which might be used to date the early occupation.
References


Plate 2. Site AS-22-42: West face of Trench 4, showing lowest occupation lens.