An Archaeological Cultural Resource Evaluation (Phase I) for Two Staging Areas to be Utilized During the Ofu-Olosega Road Improvement Project (Phases I and II), Located on Ofu and Olosega Islands, Manu’a, American Samoa

November 1996

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Abstract

Archaeological investigations have been conducted in association with the Federal Highway Administration's Ofu-Olosega Road Improvement Project, Phases I and II (Federal Aid Primary Project No. ER-AQ-92-1 (5)). This study was conducted at two locations which are to be used as staging areas during construction activities associated with the road project. The purpose of the current investigations was to determine if significant historic properties exist on the subject parcels and, if present, properly document and evaluate those sites.

Both staging areas were in locations where surface features were determined not to be present but that held the potential for subsurface deposits. Therefore, subsurface testing was recommended. Subsurface testing consisted of the mechanical excavation of four trenches (two trenches at each of the staging areas) using a backhoe. Mechanical excavations did not identify any significant properties and cultural remains recovered during these excavations were limited to modern debris and two traditionally worked artifacts.

Based upon the results of the current investigations, Archaeological Consultants of the Pacific, Inc. recommends that a determination of "no historic properties" be made for the staging areas associated with the road improvement project.
# Table of Contents

Abstract .................................................................................................................. 1  
Table of Contents ......................................................................................... ii  
List of Illustrations ....................................................................................... iii  
Section 1: Introduction ............................................................... 1  
Section 2: Physical Setting ............................................................... 1  
  Section 2.1: The Samoan Archipelago .............................................. 1  
  Section 2.2: Ofu and Olosega Islands ............................................... 3  
  Section 2.3: The Subject Property .................................................... 5  
Section 3: Historic Background and Literature Review ............ 7  
  Section 3.1: The Samoan Archipelago .............................................. 8  
  Section 3.2: The Manu’a Group, Ofu and Olosega Islands ...... 9  
Section 4: Methods .............................................................................. 12  
  Section 4.1: Research Design .......................................................... 12  
  Section 4.2: Archaeological Methodology ..................................... 13  
Section 5: Archaeological Findings .................................................. 14  
Section 6: Discussion of Archaeological Findings ................. 23  
Conclusion .............................................................................................. 28  
Bibliography .............................................................................................. 29  
Appendix A .............................................................................................. Correspondence
List of Illustrations

Figure 1: Location of Staging Areas on a Map of Ofu and Oloosega Islands................................. 2
Figure 2: Subject Parcels on a U.S.G.S. Map..................... 6
Figure 3: Trench Locations at Staging Area B................... 15
Figure 4: Staging Area B, Trench 1 Profile...................... 16
Figure 5: Staging Area B, Trench 2 Profile...................... 18
Figure 6: Artifact #SA-001........................................ 20
Figure 7: Trench Locations at Staging Area T.................. 21
Figure 8: Staging Area T, Trench 1 Profile...................... 22
Figure 9: Staging Area T, Trench 2 Profile...................... 24
Figure 10: Artifact #SA-002................................. 25
Figure 11: Elevation Profile Depicting Stratigraphic Sequences Encountered Along Transect 17........ 27
An Archaeological Cultural Resource Evaluation (Phase I) for Two Staging Areas to be Utilized During the Ofu-Olosega Road Improvement Project (Phases I and II), Located on Ofu and Olosega Islands, Manu‘a, American Samoa

Section 1: Introduction

At the request of Mr. Murray Mannion of McConnell Dowell American Samoa Ltd. (McDOW), Archaeological Consultants of the Pacific, Inc. (ACP) has conducted Phase I cultural resource investigations for two staging areas associated with the Ofu-Olosega Road Improvement Project, Phases I and II, Federal Aid Primary Project No. ER-AQ-92-1 (5), on Ofu and Olosega Islands, Manu‘a, American Samoa. This report presents the results of the archaeological investigations required to meet the American Samoa Historic Preservation Office’s (ASHPO) guidelines for a Phase I survey of potentially significant historic sites.

The current investigations were conducted under the supervision of the Principal Investigator, Joseph Kennedy, M.A.. Fieldwork was carried out by the Field Supervisor, Mr. James R. Moore, B.S., on October 28, 1995 with the assistance of a backhoe provided by the American Samoa Power Authority (ASPA). All notes and materials collected during the current investigations are curated at ACP facilities located at 59-624 Pupukea Rd., Haleiwa, HI..

Section 2: Physical Setting

Section 2.1: The Samoan Archipelago

The Samoan Archipelago is a politically divided chain of islands in the central South Pacific about 4200km (2600mi) southwest of Hawaii and 1000km (620mi) northeast of Fiji. It is located between geographic grid coordinates 168 to 173°W and 13 to 15°S. The large islands of ‘Upolu and Savai‘i, along with the small islands of Manono and Apolima, make up the independent nation of Western Samoa. To the east lies American Samoa, a territory of the United States. Tutuila, the largest island in American Samoa, and the small neighboring island of Aunu’u form a distinct subgroup about 100km (60mi) west of the Manu‘a subgroup which consists of Ofu, Olosega and Ta‘u (see Figure 1). Tiny Rose Atoll, about 160km (100mi) further east, represents the easternmost edge of the archipelago. Swains Island 375km (225 miles) to the northwest, though geographically a part of the Tokelau Islands, is the northernmost political possession of American Samoa.
Figure 1: Location of Staging Areas on a Map of Ofu and Olosega Islands

Source: University of Hawaii Press 1980
Section 2.2: Ofu and Olosega Islands

Built by volcanic activity along the crest of the easternmost portion of the submarine Samoan Ridge, the Manu’a subgroup is a typical example of "hot spot" progressive volcanism stretching from northwest to southeast. The islands share a common physiography of steep sided volcanic shields, narrow (or nonexistent) rockband coastline, fringing coral reef, and a limited area of habitable coastal plain. K-Ar dates for Ofu-Olosega of 0.3 million years Before Present (B.P.) (McDougall 1985) are consistent with the steep topography of the island which contrasts the older, more eroded islands in the Samoan Archipelago to the west.

Ofu and Olosega Islands have been described as, "a complex of volcanic cones that have been buried by lava flows from two coalescing shields" (Stice & McCoy 1968:443). One of these shields is said to have been centered off the northern coast of Ofu at A’ofa (near Sinapoto Pt.) while the second is located off the northwestern coast of Olosega near Sili Village. The islands formed where a’a and pahoehoe flows of non-porphyritic basalt, olivine basalt and picrite basalt (with hawaiites at upper elevations on Ofu) from these two shields accumulated to 494m (1621ft) AMSL at the summit of Tumu Mountain (a.k.a. Tumutumu Mountain) and 638.5m (2095ft) at the summit of Piumafua Mountain (Stice & McCoy 1968:427).

Ofu and Olosega fall entirely within the Tropical Climate Zone characterized by a maritime climate with abundant rainfall and warm, humid days and nights. Trade winds blow predominantly from the east. While data concerning rainfall for Ofu and Olosega Islands are lacking, records from the airport on Tutuila indicate a mean annual rainfall of 3100mm (124") (Nakamura 1984:Table 1). This average can be extended as being representative of Ofu-Olosega. Rainfall can vary greatly over small distances, however, due to topographical differences, with some areas receiving as much as 6200mm (250") a year.

The mean daily temperature is reported as 80 F (26.7 C) (Nakamura 1984), ranging from a mean daily maximum of 85.4 F to a mean daily minimum of 74.6 F. Humidity is generally high during day and night, ranging between 80 and 96 percent.

Hurricanes and cyclones strike the islands at irregular intervals, often after a prolonged spell of hot weather. The effect of such storms varies depending on the intensity of the storm and the path of the storm in relation to the islands. Evidence of hurricanes in the archaeological records can be found in the form of anomalous layers of gravel and rocks deposited by the high energy storm surge. The effects of such storms on the prehistoric populations of
Ofu and Olosega were certainly as serious as they have been recorded in history.

Yuncker (1945) lists 421 plant species for Manu‘a, both indigenous and introduced species. The distribution of vegetation on Ofu and Olosega is largely dependent on the amount of human disturbance which, in turn, is often limited by topography. Additional edaphic, microclimatic, and drainage conditions have a lesser effect on floral distribution. Along the coastal plains and less steep slopes, human activity has significantly modified the natural vegetation. Shifting plots of taro (Colocasia esculenta), yam (Dioscorea alata), and other crops dominate the lower elevations forming garden complexes. Additional crops found in these gardens include cultigens such as ta’amu (Alocasia sp.), ti (Cordyline sp.), moso’oi (Canaga odorata), hibiscus (Hibiscus tiliaefolius), etc., as well as stands of tree crops; mainly banana (Musa sp.), breadfruit (Artocarpus communis), coconut (Cocos nucifera), and papaya (Carica papaya) (Kirch 1993). Many of the plants in these complexes are believed to have been introduced to the islands with some of the earliest immigrants.

The coastal plains of Ofu and Olosega Islands and the more gently sloping areas, inland of the villages, are described as being located in a vegetative zone defined as "managed lands" (Atlas 1981). At higher elevations and along steeper slopes inland of the "managed lands" are areas of "coastal/littoral vegetation", "disturbed forest", as well as remnants of the original tropical "montane" forest. The steep slopes and dense vegetation that comprise the majority of the inland areas preclude any other than occasional utilization by humans. A small area of cloud forest also exists at the summit of Piumafua Mountain on Olosega Island.

Typical of island ecosystems, the fauna of Ofu and Olosega is impoverished in terrestrial vertebrates with a somewhat higher diversity of invertebrate species. The highest vertebrate diversity is among the avifauna with several permanent resident species along with seasonal migrants and visiting seabirds. As in other Polynesian islands, the avifauna diversity has been drastically reduced since human occupation began.

There is one surviving indigenous mammal, the fruit bat (Pteropus samoensis)(although informant testimony has indicated that a small, cave dwelling bat, thought to be extinct, may still be living in caves located in the cliffs along the Sili coast). Other mammals, the Polynesian rat (Rattus exulans), dog (Canis familiaris), pig (Sus scrofa), and more recently, the housecat (Felis domesticus) were all introduced. Lizards of the families Gekkonidae and Scincidae are the only other indigenous terrestrial vertebrates. Marine turtles (Chelonia mydas and Eretmochelys imbricata)
are infrequent visitors today, although they were certainly more common in the past.

The majority of the combined coastline of Ofu and Olosega is surrounded by fringing coral reef 40 to 150m wide. This complex ecosystem supports over 800 species of fish and a wide variety of invertebrates (Jordan & Seale 1906) that are heavily exploited by humans. In the open ocean beyond the coral reef are a variety of fish, dolphins and, seasonally, whales.

Kirch (1993) has developed a morphodynamic model of coastal terrace formation in relation to human occupation on Ofu. His model (based on Holocene sea level change, subsidence due to point loading on the oceanic crust, and increased sedimentary budgets in relation to the formation of the coastal terrace) would predict that the earliest formation and stabilization of the currently habitable coastal zone at To’aga occurred about 5000 to 3000 years B.P., with rapid progradation after about 2000 years B.P. He states that the area of coastal terrace available for the initial establishment of human habitation (about 3400 to 3200 years B.P.) would have been restricted to a relatively narrow beach zone at the base of steep cliffs (1993:40). Similarly, the earliest habitation on Olosega, would be situated in a similar geomorphological location.

Hunt and Kirch (1988) suggest that coastal terrace progradation on Ofu and Olosega was accelerated by an increased sedimentary budget due to deforestation and clearing by human occupants. Kirch’s morphodynamic model implies that the earliest archaeological deposits will be found at considerable depths, more likely in the former coastal terrace areas and adjacent marshlands.

Section 2.3: The Subject Property

The current investigations were conducted at two locations on Ofu Island which will be used as staging areas during construction activities associated with the Ofu-Olosega Road Improvement Project, Phases I and II. The first area (Staging Area B) is located at the eastern end of Ofu, near the bridge at Asagatai Pt., while the second area (Staging Area T) is located along the To’aga coastline of Ofu at Fa’ala’aga (see Figure 2).

Staging Area B lies on level ground between the base of the hillside and the bridge crossing Asaga Straight. Specifically, it is located at geographic grid coordinates 18°38.04′W by 14°10.09′S and measures approximately 50m in diameter (2000 sq.m, 20 are, 0.49 acre). Vegetation at Staging Area B consists of a ground cover of patches of grasses between beds of ground clinging vines, predominantly the beach morning glory (Ipomoea pes-caprae). Trees and
Figure 2: Subject Parcels on a U.S.G.S. Map

Source: Topographic Map of the Manua Islands, American Samoa 1963
shrubs do not occur until reaching the base of the hillside, outside of the project area.

Staging Area T lies along the edge of the road at Fa’ala’aga in the coastal flats near the eastern end of To’aga (Site AS-13-1) on property formerly used by McDOW for a gravel crusher. It is located at geographic grid coordinates 169°38.55’W by 14°10.15’S and measures approximately 50m in diameter (2000 sq.m, 20 are, 0.49 acre). Staging Area T occupies a lot that has been previously cleared, originally when a small structure on the property was still in use and again when the McDOW crusher was in use. Therefore, vegetation on the parcel lacks trees consisting entirely of a ground cover of grasses (e.g. elephant grass, Pennisetum sp.) which in spots is overcome by the beach morning glory (Ipomoea pes-caprae) which has migrated across the road from the nearby beach. Trees and shrubs including banana, papaya, coconut, hibiscus, macaranga (Macaranga grandifolia), etc., (remnants of formerly more extensive managed plots) occur beyond the boundaries of the cleared lot, outside of the project area.

Both staging areas lie in areas depicted in the Atlas of American Samoa as containing the soil type described as "Ngedebus mucky sand" (Atlas 1981). These calcareous soils are produced from rubble and sand derived from coral and shells forming deep and excessively drained deposits which are used for subsistence farming. The upper strata are said to be high in organic content. The actual soils encountered will be described in Section 5.

Section 3: Historic Background and Literature Review

The prehistory of Samoa is intimately linked with that of its neighboring islands and Polynesia as a whole. It has been documented that a seafaring people, travelling from the islands of Southeast Asia, spread eastward throughout the islands of the South Pacific (Kirch & Green 1987 and Jennings 1979). These people developed a unique culture that has become known as the Lapita cultural complex and is named for an archaeological site in New Caledonia from which distinctive pottery crafted by its occupants was recovered. In Samoa, the descendants of the Lapita cultural complex continued crafting pottery until at least A.D. 200 (although recent work has indicated the use of ceramics up to one thousand years later [Clark 1993 and Kirch & Hunt 1993]). This cultural complex has become well documented over the past several years and will not be reviewed further in this paper. Thus, the Lapita people are believed to be the first inhabitants of Samoa and, over the millennia, these original Lapita settlers developed a sub-culture unique to Samoa with its own mythology and cosmology.
Section 3.1: The Samoan Archipelago

Writings concerning sites of an archaeological nature in the Samoan Archipelago can be traced backed to the early missionaries and secular writers of the 19th century. These authors, in the course of describing Samoan life at the time, or their experiences in Samoa, on occasion give general locations for large sites such as abandoned villages and individual site types such as mounds, raised walk-ways and religious structures (fale aitu) (Pritchard 1866; Turner 1884; Stair 1897; Churchward 1887; Stair 1895, 1897; Churchill 1902; Williams 1984). In addition, some authors explicitly described archaeological sites as such (Sterndale 1890; Stair 1894). Thompson (1927) provides a description of earthmounds in Western Samoa. Kramer’s (1902-3) ethnography of Samoa and Buck’s (1930) volume on Samoan material culture provide ethnohistoric information of interest to the archaeologist. In the 1940’s, Freeman (1943, 1944a-c) described a number of archaeological sites. Using ethnohistoric material, Watters (1956, 1958), a geographer, constructed a model of early Samoan settlement patterns.

Modern archaeology in Samoa began in the late 1950’s and early 1960’s with Golson’s (1957) preliminary survey and excavations followed by Green and Davidson’s (1969, 1974) extensive surveys and excavations in Western Samoa. Another large survey and excavation project was carried out in Western Samoa in the 1970’s (Jennings et al. 1976; Jennings & Holmer 1980). These surveys provided detailed information on settlement patterns, site types, artifact classes, and a chronology that placed initial occupation of the islands at c. 3000 B.P.. In addition, the discovery of Lapita pottery on Upolu in Western Samoa was important information linking the origin of Samoan peoples to migrations from as far away as the Bismarck Islands located north of Papua, New Guinea (Jennings 1974, Kirch 1988).

Meanwhile, by comparison, very little archaeological work was being carried out in American Samoa. Kikuchi (1963, 1964) conducted a preliminary survey and description of surface sites primarily based on informant testimony and site checking. He and Sinoto conducted some very limited test excavations on Tutuila and Ta’u (Emory & Sinoto 1965). Several contract cultural resource management surveys were conducted by Federal agencies (Ladd 1970; Kikuchi, Palama & Silva 1975; Silva & Palama 1975; McCoy 1977). In 1972, Frost (1976, 1978) carried out the next research directed survey. Clark (1980) compiled a site inventory based on a review of previous work, field checking of sites and very limited survey. Little of this research was intensive or systematic and where it was, it was limited to small project areas tied to compliance.
In 1985, after more than a decade of unproductive years, a revitalized American Samoa Historic Preservation Office began funding a series of systematic archaeological surveys and excavations throughout the Territory (Gould, Honor, & Reinhart [later Brophy] 1985; Kennedy 1985; Brophy 1986; Leach & Witter ca. 1986, 1987; Ayres & Eisler 1987; Hunt 1987; Hunt & Kirch 1988; Clark & Herdrich 1988, 1993; Best, Leach & Witter 1989; Clark 1989; Herdrich 1991; Herdrich & Clark 1993; Kirch & Hunt 1993). These surveys and excavations created a much needed baseline understanding of site distribution, provided detailed excavations of the first early pottery sites known for the Territory, and contributed to the understanding of geomorphological processes that are important to locating early sites. It has also stimulated academic interest in the Territory thereby encouraging scholars to seek funding and carry out work independently of the Historic Preservation Office (Sheppard et al. 1989; Best et al. 1992; Best 1994; Clark & Nunn 1994; Clark & Michlovic 1996; Clark, Wright & Herdrich in review). In addition, beginning in 1989, enforcement of the National Historic Preservation Act of 1966 led to an increase in the number of archaeological compliance projects conducted in the Territory (Kennedy 1989; Clark 1990a-b; Foster 1991a-b; Best 1992a-b, Moore & Kennedy 1996; Shapiro & Cleghorn 1994; Herdrich et al. 1995).

Section 3.2: The Manu’a Group, Ofu and Olosega Islands

Kramer (1902) visited the Manu’a Islands in 1898 providing some limited information on abandoned villages as well as a song that mentions the existence of pigeon catching mounds (tia seu lupe) on Ta’u. On Olosega, Kramer also noted the legendary location called “Nu’utoa”, an isolated cliff on the western slopes of Piumafua where the mountain drops toward Ofu. This legendary spot is associated with a warrior chief named Pao who, according to Kramer (1902:597), was “the Hero of Olosega”.

Buck (1930:322-24) also provides some information about Manu’a, primarily concerning a raised road in Fitiuta, but the first modern archaeological survey work in Manu’a was conducted by Kikuchi and Sinoto (Emory & Sinoto 1965) whose efforts were primarily directed towards Ta’u Island. Clark (1980) visited the Manu’a group while compiling his territory wide inventory of archaeological sites and recorded eight sites on Ofu, eight sites on Olosega, and 50 sites on Ta’u.

In 1986, Hunt and Kirch (1988) carried out test excavations on all three islands as well as additional survey. Their survey acknowledged the presence of 62 sites on Ta’u, eleven sites on Ofu, and nine sites on Olosega, however, it is not stated in their paper whether any of these sites are the same as those inventoried by Clark in 1980. Based upon the results of limited subsurface testing
conducted on all three islands, they concluded, "that by the start of the first millennium A.D. both Ta'u and Ofu Islands were ... occupied by makers of Polynesian Plain Ware" (Hunt & Kirch 1988:169).

In 1987 and 1989 they focused their efforts on the To'aga site (Site AS-13-1) on Ofu by conducting two seasons of test excavations (Kirch & Hunt 1993). They estimated the To'aga site to cover 21,000 square meters, within which the area of subsurface testing measured 31 square meters (0.15% of the total area). Based upon the results of their excavations, Kirch and Hunt have generated a geomorphological model for the southeastern coastline of Ofu in which coastal terrace formation occurs through coastal progradation and lateral transgression of the sedimentary budget (refer to Section 2.2). In addition, they propose that To'aga has been, "continuously occupied by prehistoric Polynesians for a full three millennium" (1993:230).

During the analysis of the excavation data for To'aga, radiocarbon dating was conducted on a set of fourteen samples. Of the fourteen samples dated through radiocarbon analyses, nine were derived from marine shell samples, two samples consisted of small amounts of charcoal in ash and sediment matrices, and three were of charcoal samples weighing less than one gram. Because of the types of materials selected for radiocarbon dating, it is possible that the age of the many of the samples may not be contemporaneous with the cultural context from which they were obtained.

Although several species of marine shells were tested, the majority were of Turbo setosus (six of the nine marine shell samples). It is known that shells of the species T. setosus are utilized by terrestrial dwelling hermit crabs, potentially effecting their deposition within stratigraphic sequences. Two of the remaining three shell samples dated were represented by single shells which, being collected from deposits associated with a high energy beach environment, decreases the probability that they were indeed culturally deposited. It is also possible that shells selected for cultural modification were deposited years before the cultural context from which they were recovered was deposited. Finally, the accepted correction factor (delta-R) of the marine reservoir effect for calibrating age ranges based on marine samples has changed dramatically over the past ten years (Dye 1993), thereby increasing the possibility that calibrations would skew the results in either direction. For all of these reasons, the accuracy of calibrated ages from marine shell samples should be questioned.

Two of the samples which were radiocarbon dated consisted of charcoal and ash in sediment matrices. Samples analyzed that are derived from sedimentary matrices are
likely to date the sediments themselves rather than the cultural context of the deposit. Because sediments are derived from calcareous and basaltic sources which incorporated the carbon found in their structures thousands of years before they became sediments, it is probable that radiocarbon analyses date the source of the sediments and not the cultural context from which they were recovered. In addition, when cultural features are identified within a stratigraphic sequence, it is possible that the sediments within the feature are intrusive and not contemporaneous with the cultural strata in which they are found. Therefore, the effect of dating sediments obtained from a cultural context may skew the results of radiocarbon analyses.

The final three analyses were conducted on samples weighing less than one gram. Because of the necessity of requiring extended counting times for dating samples weighing less than one gram, thereby increasing statistical variance, the results from these samples also have the potential to be misinterpreted.

Therefore, the entire suite of radiocarbon ages obtained by Kirch and Hunt for To’aga should be interpreted with caution. Although the dates obtained during the radiocarbon analyses may not definitively substantiate the age of the site, the presence of ceramic remains (and the range in form of those remains) indicate that the site is of considerable antiquity comparable to that of other ceramic bearing sites in Samoa. When considering the radiocarbon dates and the presence of ceramics at To’aga in relation to recent results obtained by Clark at Aoa (1993; see also Clark & Michlovic 1996), the age of initial occupation at To’aga may range from as early as 1000 B.C. to as late as 1400 A.D..

The Ofu-Olosega Road was previously investigated during a reconnaissance survey conducted by Best (1992). His study took place along the entire roadway on both Ofu and Olosega Islands. This survey was limited due to the fact that the finalized path of the improved roadway had yet to be determined. Best identified 23 sites (21 on Ofu and two on Olosega) and conducted limited subsurface testing in the vicinity of Sites AS-13-11, 12 and 13 at Vacto. Of the 23 sites identified, 15 of these (Sites AS-13-7, 8 and 14 through 26) are actually located within the area defined as Site AS-13-1, the To’aga site.

The most recent work conducted on Ofu and Olosega Islands was undertaken in association with Phases I and II of the Ofu-Olosega Road Improvement Project (Moore & Kennedy 1996). Those investigations were directed toward the roadway corridor while the current investigations were directed towards the staging areas which were to be used during construction activities associated with the improvement project. The archaeological investigations conducted within
the roadway corridor documented seven sites (Sites AS-12-9 and AS-12-11 through 16) with a total of ten component features including a boulder with grinder basins, a mound/platform, stone alignments, terraces, a rock shelter, a legendary stone outcropping, and portions of a historic water supply system. All of these sites were identified on Olosega Island, within Phase II of the project. The results of those investigations revealed evidence of a dispersed pattern of settlement and land use along the Sili coast of Olosega that began in the pre-contact period and continued into post-contact times.

Section 4: Methods

Section 4.1: Research Design

Archaeological work conducted in the Samoan archipelago relates to large variety of research topics. The results of the current work has relevance or potential relevance for two specific research topics discussed below.

The first topic of concern is the pattern of settlement distribution. Previous research in Samoa has shown a settlement pattern that started with coastal settlement. At some point in time, as the population expanded, the loci of habitation moved inland until there was a shift, in the late prehistoric/early historic period, from those inland settlements back to coastal habitation areas (Davidson 1969, 1974). Because there has been a limited amount of controlled survey conducted on ofu and Olosega Islands, as additional areas are surveyed, a more comprehensive understanding of settlement patterns and land use histories will be forthcoming.

A second topic of interest is the geomorphological model of coastal terrace formation proposed by Kirch and Hunt for Ofu Island (Hunt & Kirch 1988, Kirch & Hunt 1993). Kirch and Hunt’s model hypothesizes that coastal terraces in Manu’a have prograded rapidly over the past 5000 years due to an increased sedimentary budget caused by deforestation and clearing by early human settlers. By conducting subsurface testing at various coastal locations and documenting the stratigraphic sequences from varying geomorphological locales, a data base of information will be gathered which can be used to test Kirch and Hunt’s hypothesis.

The primary purpose of the current investigations, though, was to identify and evaluate historic and prehistoric archaeological sites as required by Section 106 of the National Register of Historic Places as amended, particularly Part 800 concerning the protection of historic and cultural properties. Due to the fact that this investigation is compliance oriented, the investigators were not guided by an
explicit theoretical orientation other than a very general scientific and evolutionary perspective. Also, given that this is a compliance investigation it was not guided by explicit hypothesis testing. However, some of the current findings may contribute to and have implications for hypotheses that are currently being discussed in the literature. The information collected during this survey has potential implications for the recent work discussed above concerning settlement patterns and geomorphological models.

Section 4.2: Archaeological Methodology

The current investigations were conducted under the supervision of the Principal Investigator, Joseph Kennedy, M.A. Fieldwork was carried out by the Field Supervisor, Mr. James R. Moore, B.S., on October 28, 1995 with the assistance of a backhoe provided by the American Samoa Power Authority (ASPA).

The staging areas under consideration during the current investigations are located in an exposed coastal area with little vegetation (Staging Area B) and in an area which displayed evidence of modern disturbances (Staging Area T). It was believed that there was little likelihood of identifying archaeological surface remains in these areas, although there was the potential for intact subsurface deposits to be present at both locations. Therefore, following consultation with the American Samoa Historic Preservation Office (ASHPO) and Mr. David Herdrich, the Territorial Archaeologist, it was determined that subsurface testing should occur.

Subsurface testing took place through the mechanical excavation of trenches using a backhoe with an 18 inch bucket. These trenches were placed at locations chosen by the field supervisor in order to adequately sample the subject areas. All soils removed from these trenches were thoroughly raked and all potential cultural materials examined and/or collected.

Samples collected included artifacts and soil samples. All potentially significant artifacts were collected and placed in labelled bags. Artifactual material was subsequently sorted and analyzed with the results tabulated for presentation by provenience. Soil samples were collected from each layer for analysis of soil color and composition. Drawings of the trench wall profiles were made.

This report provides complete descriptions of the excavations undertaken including written accounts, placement of the test trenches on plans drawn to scale, profiles depicting stratigraphic and/or cultural deposits (refer to Section 5). Also included are soil descriptions according to
U.S.D.A. standards and the presentation of the results of all laboratory analyses described above.

All materials collected during test excavations will be bagged and labelled appropriately, placed in labelled and inventoried boxes, and curated at ACP facilities located at 59-624 Pupukea Rd., Haleiwa, HI.

Section 5: Archaeological Findings

The current archaeological investigations consisted of subsurface testing conducted at two locations which are to be used as staging areas for construction activities associated the Ofu-Olosega Road Improvement Project. Two trenches were mechanically excavated at each staging area. Each excavation unit will be described below.

Staging Area B

Trench 1: Trench 1 at Staging Area B was placed towards the inland boundary of the staging area. It was located in an area covered with beach morning glory vines adjacent to the former Asaga Grill (see Figure 3). The trench measured 9.8m (meters) in length and reached a maximum depth of 215cmbs (centimeters below surface).

Excavation encountered a surface cover of vines and detritus underlain by a layer (Layer I) of black (7.5YN 2/0) sandy loam which measured approximately 20cm thick and reached a maximum depth of 25cmbs (see Figure 4). Layer I was underlain by a layer (Layer II) of very pale brown (10YR 7/3) fine to medium grained sand which measured approximately 80cm thick and reached a maximum depth of 115cmbs. This was in turn underlain by Layer III, a light yellowish brown (10YR 6/4) medium to coarse grained sand which was excavated to a depth of 215cmbs. Two thin lenses (i and ii) were encountered, the first at the interface between Layer II and III (approximately 120cmbs) and the second embedded within Layer III (approximately 160cmbs). Both measured approximately 10cm thick, extended no more than 2.5m in length, and were composed of dark brown to very dark brown sandy loams.

A small pit was noted in the southern face of the trench that displayed a distinctly stained area in which pieces of burnt coral were identified. This pit was cut from Layer I into Layer II approximately 4m from the eastern end of the trench at a depth of between 25 and 40cmbs (see Figure 4). It measured approximately 80cm in length and reached a maximum thickness of 15cm. A small amount of historic debris (i.e. a fragment of an aluminum can, remnants of a plastic bag, glass fragments, etc.) was also recovered from Trench 1, some of which was identified from Layer II deposits, visible
Figure 3: Trench Locations at Staging Area B

Asaga Grill

GPS Point

Staging Area B

source: American Samoa Government Department of Public Works p. 27/28
Figure 4: Staging Area B, Trench 1 Profile

Southern Face

2m
E
0 50 100 150 200 250 5m
W
0 300cm

surface

Layer I

Fire Pit
10YR 2/1

Layer II

Layer III

lens i

lens ii

unexcavated

Total Length 9.8m
Maximum Depth 215cmbs

Layer I: 7.5YN 2/0, black, sandy loam.
Layer II: 10YR 7/3, very pale brown, fine to medium grained sand.
Layer III: 10YR 6/4, light yellowish brown, medium to coarse grained sand.
Lens i: 10YR 2/2, very dark brown, sandy loam.
Lens ii: 7.5YR 3/3, dark brown, sandy loam.
in the sides of the trench approximately 100cmbs. Based upon the depth of the pit as well as the recovery of historic debris from deposits beneath the pit, it is probable that this pit is a modern feature. According to informant testimony, the entire area on which Staging Area B is located, a swath between the bridge and the base of the hillside, was washed away during Hurricane Val. Following the repair of the road approaching the bridge at Asagatai Pt., in this area, soils accumulated rapidly. The recovery of plastic debris at depths of 100cmbs would support this scenario. Therefore, it is likely that the soils encountered to depths of at least 100cmbs have been deposited in the last few years.

Trench 2: Trench 2 at Staging Area B was placed towards the seaward boundary of the staging area. It was located in an area covered with tufts of coarse grass adjacent to a small driveway which extended off the existing roadway (see Figure 3). The trench measured 10.0m in length and reached a maximum depth of 235cmbs.

Exavcation encountered a surface cover of grass and detritus at the trench’s northern end and beach morning glory vines at the trench’s southern end. The surface cover was underlain by a layer (Layer I) of dark grayish brown (10YR 4/2) loamy sand which measured approximately 20cm thick and reached a maximum depth of 25cmbs (see Figure 5). Layer I was underlain by a layer (Layer II) of very pale brown (10YR 7/3) fine to medium grained sand which measured approximately 25cm thick and reached a maximum depth of 50cmbs. This was in turn underlain by Layer III, a very pale brown (10YR 8/3) fine to medium grained sand which was excavated to a depth of 235cmbs.

Several water worn stones (30 to 70cm in diameter) were identified in the eastern face of the trench near its southern end. These stones were roughly grouped, forming a steeply sloped alignment apparently washed into place on a sandy embankment. Because it is believed that the ground cover interface between grass and vine is a remnant of the effects of Hurricane Val which washed out a substantial section of land that has since filled in rapidly (grass covering areas that escaped being washed away and vines covering areas that were washed away), because these stones are located in deposits below this interface, and because of the steepness of the angle at which the stones were aligned, it is believed that this group of stones was deposited as the result of storm activity during Hurricane Val, December 7 - 10, 1991.

As with Trench 1 at Staging Area B, a small amount of historic debris was identified in the soils excavated from Trench 2. In addition, one traditionally worked artifact was recovered from the raked soils from this trench. This
Layer I: 10YR 4/2, dark grayish brown, loamy sand.
Layer II: 10YR 7/3, very pale brown, fine to medium grained sand.
Layer III: 10YR 8/3, very pale brown, fine to medium grained sand.
artifact (Artifact #SA-001) was worked from marine shell having a mother-of-pearl sheen on one surface. The artifact has two knots carved into one end while the other end is broken (see Figure 6). It is likely the remains of a broken fishhook or lure.

**Staging Area T**

**Trench 1:** Trench 1 at Staging Area T was placed atop a square earthen mound that had been built by McDOW to be used as a foundation pad for a gravel crusher (see Figure 7). The crusher pad stood 50 to 70cm above the current ground level at the time of these investigations. The trench measured 12.1m in length and reached a maximum depth of 225cmbs.

Excavation encountered a surface cover of grass and detritus underlain by a layer (Layer I) of very pale brown (10YR 7/3) fine grained sand which measured approximately 55cm thick and reached a maximum depth of 65cmbs (see Figure 8). The depth which Layer I reached corresponded with the base of the crusher pad. Layer I was underlain by a layer (Layer II) of very pale brown (10YR 8/3) fine grained sand which measured approximately 90cm thick and reached a maximum depth of 140cmbs and was in turn underlain by Layer III, a dark grayish brown (10YR 4/2) sandy loam which was excavated to a maximum depth of 225cmbs. The fact that the principle component of the Layer III deposits was a loam which likely originated from a basaltic source indicates that this deposit is terrestrially derived.

A small amount of historic debris was identified from the soils excavated from Trench 1. The debris included sand encrusted fragments of rusted metal, broken glass, a fragment of modern ceramic, and thin strips of aluminum apparently derived from a can.

According to informant testimony, the soils used to form the crusher pad were dredged from the harbor at Ofu Village and brought to the subject parcel. The property has also been said to have been used in the past as a transfer point for fill. Material dredged from the harbor would be dumped on the subject parcel awaiting use for road fill and/or resurfacing material. The recovery of historic debris is consistent with this information.

**Trench 2:** Trench 2 at Staging Area T was placed immediately in front of the abandoned structure located in the middle of the cleared parcel (see Figure 7). The trench measured 17.4m in length and reached a maximum depth of 220cmbs.

Excavation encountered a surface cover of grass and detritus underlain by a layer (Layer I) of very pale brown (10YR 7/3) fine grained sand which measured approximately 10cm thick and reached a maximum depth of 10cmbs (see Figure
Figure 7: Trench Locations at Staging Area T

- Beach
- Road
- Jungle
- GPS Point
- Staging Area
- Former crusher pad
- Jungle
- T2
- T1
- abandoned concrete block structure
- cleared area
- Base of Cliff (approximate location)

Ofu Staging Areas
Archaeological Consultants of the Pacific, Inc. 1996
Figure 8: Staging Area T, Trench 1 Profile

Northeastern Face

Layer I: 10YR 7/3, very pale brown, fine grained sand.
Layer II: 10YR 8/3, very pale brown, fine grained sand.
Layer III: 10YR 4/2, dark grayish brown, sandy loam.
9). Layer I was underlain by a layer (Layer II) of dark yellowish brown (10YR 3/4) loamy sand which measured approximately 20cm thick and reached a maximum depth of 30cmbs. This was in turn underlain by Layer III, a yellowish brown (10YR 5/4) loamy sand which measured up to 20cm thick and reached a maximum depth of 50cmbs. Underlying Layer III was a deposit (Layer IV) of very pale brown (10YR 7/4) fine grained sand which measured approximately 120cm thick and reached a maximum depth of 180cmbs. The basal deposit encountered consisted of a layer (Layer V) of dark brown (7.5YR 3/2) sandy loam which was excavated to a depth of 220cmbs. Layers IV and V in Trench 2 are believed to directly correspond with Layers II and III in Trench 1 and these corresponding deposits represent the natural stratigraphy of the area. It is only the upper deposits (Layer I in Trench 1 and Layers I through III in Trench 2) which are believed to represent modern fill.

A variety of modern trash (broken glass, aluminum cans, plastic, etc.) was identified in the upper stratigraphic deposits, predominantly from the northeastern end of trench, closer to the abandoned structure. In addition, one traditionally worked artifact was recovered from the raked soils from this trench. This artifact (Artifact #SA-002) was worked from coral forming a crude one-piece fishhook. The artifact has been worked to form a knob at the top of its shaft while the point is broken (see Figure 10). Evidence of modification is also visible on the curve at the base of the shaft.

Section 6: Discussion of Archaeological Findings

The current investigations were conducted at two staging areas that will be used in association with the Ofu-Olosega Road Improvement Project, Phases I and II. During these investigations, four trenches were mechanically excavated in order to determine if significant subsurface deposits were present. No significant deposits were encountered during these excavations and no significant properties were identified, although, a variety of historic debris and two artifacts of traditional manufacture were recovered. In addition, stratigraphic data were gathered which will provide information concerning geomorphological processes occurring at these locations.

The majority of material identified during the current investigations consisted of historic debris such as aluminum cans and can fragments, broken glass, modern ceramic fragments, plastic, etc. The two traditionally worked artifacts were both items of fishing gear. Artifact #SA-001 was recovered from Staging Area B while Artifact #SA-002 was recovered from Staging Area T. Both of these locations are coastal and the recovery of isolated items of traditional
Figure 9: Staging Area T, Trench 2 Profile

Eastern Face

13.4m

N 0 50 100 150 200 250 16.4m
S 0 50 100 150 200 250 300cm

surface

Layer I
Layer II
Layer III
Layer IV
Layer V
unexcavated

Total Length 17.4m
Maximum Depth 220cmbs

Layer I: 10YR 7/3, very pale brown, fine grained sand.
Layer II: 10YR 3/4, dark yellowish brown, loamy sand.
Layer III: 10YR 5/4, yellowish brown, loamy sand.
Layer IV: 10YR 7/4, very pale brown, fine grained sand.
Layer V: 7.5YR 3/2, dark brown, sandy loam.
fishing gear should not be considered unique, although, the recovery of a broken, one-piece fishhook made from coral (Artifact #SA-002) is the first example of such an item collected from an archaeological context in Manu‘a.

An interesting finding during the current investigations concerns the geomorphology of the Fa‘ala‘aga end of the To‘aga Site (AS-13-1). Staging Area T was located in the vicinity of Transect 17 which was established during the 1989 season of field work conducted by Kirch and Hunt (1993). The location of Transect 17 is depicted in Kirch and Hunt’s Figure 5.8 (1993:59) and, based upon the scales provided, its approximate position can be plotted on Kirch and Hunt’s Figure 3.1 (1993:25). When compared to the location of Staging Area T (see Figure 2), Transect 17 crosses Fa‘ala‘aga very near the current subject property.

Excavations at Staging Area T revealed a layer of sandy loam at a depth of approximately 2m below ground level (see Figure 11). The layer of sandy loam is overlain by a deposit of fine grained, calcareous sand that is up to 1m thick. The sandy loams are believed to be terrestrially derived deposits originating from basaltic sources while, based upon the grain size, the fine grained calcareous sands above appear to have been deposited in a low energy environment.

Excavations conducted by Kirch and Hunt along Transect 17 (Units 24 and 25) were conducted inland of the staging area. These excavations encountered a layer of coarse grained sands containing a substantial amount of coral at a depth of approximately 2m below ground level (see Figure 11). This deposit of coarse grained sand was overlain by a deposit of sandy loam. Based upon the sequence of these deposits, Kirch and Hunt suggested that the excavations along this transect revealed "a gradual transition from a very high-energy, exposed beach ... to a lower-energy beach ... to the formation of a stable coastal terrace with soil development under vegetation" (1993:80). In addition, they believe that the coastal terrace, "in the vicinity of Fa‘ala‘aga (Transect 17), remained a high-energy beach until relatively recently" (1993:234).

Based upon the elevation profile of Transect 17 prepared by Kirch and Hunt (1993:81), at Staging Area T mean sea level is just over 2m below ground level while at Units 24 and 25 mean sea level is at 2m below ground level (see Figure 11). The presence of terrestrially derived soils located 100m from the base of the talus slope at depths near current mean sea level seems to contradict the proposed model of coastal terrace formation along Transect 17 as suggested by Kirch and Hunt.

While it is known that sea level changes have occurred in the Pacific Ocean over the last five thousand years and
that the islands have also subsided over that time, Kirch and Hunt state that over the last three thousand, "the actual sea level on Ofu would have been either stable, or there may have been a slight fall" (1993:39). Therefore, sea level change and/or the subsidence of the island cannot account for the presence of terrestrial soils at the depths encountered. Considering the possibility that deposits of coarse sands could underlie the terrestrially derived sandy loams encountered at the base of the excavations at Staging Area T, the sequence of deposits would still indicate that the processual changes in soil deposition at Fa’ala’aga differ from a model which suggests that the area, "remained a high-energy beach until relatively recently" (1993:234).

It is possible that the presence of terrestrial soils, at the depths encountered, could be explained by the lateral transgression of the sedimentary budget (which Kirch and Hunt believe occurred from southwest to northeast [1993:234]) filling a hypothetical embayment located at Fa’ala’aga if that transgression occurred over a longer period of time than that suggested by Kirch and Hunt. A comprehensive series of geological test cores (conducted in transects crossing the coastal terraces) identifying the sequence of sedimentary deposits as well as the depth of the reef would provide much needed information concerning the geomorphological processes occurring along the To’aga coastline of Ofu.

Conclusion

Archaeological investigations have been conducted in association with the Federal Highway Administration’s Ofu-Olosega Road Improvement Project, Phases I and II. This study was conducted at two locations which are to be used as staging areas during construction activities associated with the road project. Mechanical excavations did not identify any significant properties and cultural remains recovered during these excavations were limited to modern debris and two traditionally worked artifacts. The presence of isolated pieces of traditional fishing gear in two, separate coastal locations is not considered representative of a significant historic property.

Based upon the results of the current investigations, Archaeological Consultants of the Pacific, Inc. recommends that a determination of "no historic properties" be made for the staging areas associated with the road improvement project.
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APPENDIX A

Correspondence
Mr. John Enright, Historic Preservation Officer
American Samoa Department of Parks and Recreation
Pago Pago, American Samoa 96799

Dear Mr. Enright:

Subject: Project AS-ER-AQ-92-1(005). Reconstruction of THS Route 20, Ofu/Olosega - Compliance with Section 106 of the National Historic Preservation Act of 1966 with Amendments

Thank you for your letter which advised this office of potential violations of the Section 106 process. Please be advised that during the initial stages of preliminary engineering for this project, this office worked closely with Mr. Roderick Brown of your office as well as engineers in the Department of Public Works. An acceptable specification for the needed archaeological work was jointly developed. As I am sure you are aware, the design project went through considerable changes over the past couple of years. Apparently, one of the changes inadvertently removed the jointly developed specification. We have been in contact with Messrs. Fred Pele and Howard Tingley to discuss ways to correct this oversight. It has been agreed that ASPA will initiate a contract change order with the contractor for the work, or a qualified archaeologist will be hired to conduct the needed investigations in accordance with Section 106 requirements. We are hereby requesting that your office provide the needed technical assistance to ASPA in detailing the work required by the archaeologist.

This federal-aid project is an "undertaking" to reconstruct hurricane damaged portions of Territorial Highway System (THS) Route 20 from the existing concrete roadway to the bridge, which connects the islands of Ofu and Olosega. This portion is considered as Phase I and is approximately 1.2 kilometers in length. The section will consist of a 5.5 meter wide portland cement concrete roadway with 1.2 meter wide concrete ditches.
along the inland side of the road. The new roadway will be located in the existing roadbed. In an effort to protect this roadway from future storms, shore protection has been incorporated into the project.

Phase II of the project is approximately 1.2 kilometers in length. It begins on the island of Olosega adjacent to the bridge and goes toward the village of Sili. The width of roadway for Phase II will be 3.6 meters. The plans call for shifting the roadway to match the existing terrain. Please note that this section of roadway has been destroyed by two consecutive hurricanes. The roadway is being replaced in an effort to allow the Sili villagers to return to their land.

An Archaeological Reconnaissance Survey was performed for this project in 1992. (copy enclosed) The survey took into account the area within 9 meters on both sides of the existing roadway. Twenty-three sites were located through the survey. Please note that the survey was conducted over the entire length of TNS 20 on both islands. The current construction project involves only a small portion of the area surveyed. As discussed with Mr. David Herdich, Territorial Archaeologist, the new revetments, culverts, and utility cuts may impact archaeological sites which have not yet been discovered. These areas will be included in the new survey.

The area of potential effect (APE) for this project will be the roadbed itself plus the side slopes and ditches. As noted previously the purpose of this project is to reconstruct the hurricane damaged portions of TNS 20. Thus, a considerable amount of the existing roadway was destroyed by two successive hurricanes. The survey performed for this project indicates that some of the identified sites have already been disturbed by previous roadwork. With this in mind we have determined that this federal undertaking will not cause any changes in character or use of the historic properties.

From the survey supplied to this office, it appears that the only potential historic property which will be impacted by this project is site AS-12-9 along the road to Sili. The survey indicates that this site needs to be protected and monitored during construction. We concur with this finding and by copy of this letter are hereby advising the ASDA to comply with this determination. We are also advising the ASDA to coordinate any work in this area with the Territorial Archaeologist. This
project will have no adverse effect on site AS-12-9.

Your letter discusses the section of road adjacent to the Lalomaona area near the village of Sili. We concur in the determination that this area was not included in the previous survey. The new archaeological survey will take this area into consideration. Based on the fact that the road to Sili will be constructed over the existing alignment, we do not anticipate any adverse effects to this area. However, this will need to be determined through further study.

This office looks forward to the expeditious completion of the work necessary to evaluate the sites and make any determinations as to whether or not any sites are discovered which may or may not be eligible inclusion on the National Register. We will work with your office and ASPA to assure that all section 106 requirements are satisfied. Please contact this office if further information is required.

Sincerely,

Abraham Wong
Division Administrator

By:

[Signature]

Raymond J. McCormick
Territorial Representative

CC:
Mr. Abe U. Malae, Executive Director ASPA
Mr. Manusinalesono S. Fuletasi, Director of Public Works