A Cultural Resource Evaluation (Phases I and II) for a Portion of Road 1b, Phase I of the Tau'u Road Reconstruction Located on Tau'u Island, Manua
American Samoa
October 1996

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Federal Highway Administration Contract #AS-NH-030(4)

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Section 1: Introduction

At the request of Mr. Murray Mannion of McConnell-Dowell Ltd. (hereafter MACDOW), Archaeological Consultants of the Pacific, Inc. (ACP) has conducted Phase I and Phase II cultural resource investigations for a portion of Road 1b in Phase I of the Ta’u Road Reconstruction Project, Contract #AS-NH-030(4), on Ta’u Island, Manu’a, American Samoa. This report presents the results of the archaeological investigations required to meet the guidelines of the Phase I and Phase II survey and evaluation of potentially significant historic sites.

The survey evaluated the significance of three known sites (AS-11-59, 60, and 61) and identified three additional sites (AS-11-73, 74, and 75). A systematic shovel test survey was conducted to determine the extent and nature of subsurface archaeological resources along the portion of the road scheduled for construction. In addition, three quarry sites were examined, two controlled test units, and one test trench were excavated. The results of these investigations are reported below. Recommendations are given concerning each site and are restated in the conclusions.

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 U.S. territory. Tutuila, the largest in American Samoa, and the small neighboring island Anu’u form a distinct subgroup about 100km (60 miles) west of the Manu’a subgroup of Ofu, Olosega, and Ta’u (see Figure 1). Tiny Rose Atoll, about 160km (100 miles) 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: The Samoan Archipelago and Ta'u Island (Including Quarry Locations)

Source: Kirch and Hunt 1993

Road 1b (Por) Ta'u Road Reconstruction, Phase I

Source: University Press of Hawaii 1980
Section 2.2: The Manu’ a Group and Ta’u Island

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 "hotspot" progressive volcanism stretching from northwest to southeast. Ta’u represents, at 28.5 square kilometers, the largest volcanic center of the subgroup, where a’a and pahoehoe flows of non-porphyritic basalt, olivine basalt, picrite basalt, and feldspar-phyric basalts accumulated more than 912m (3006ft) AMSL at the summit of Lata Mountain (Stice & McCoy 1968). The three islands share a common physiography of a steep sided volcanic shield, narrow (or nonexistent) rockband coastline, fringing coral reef, and a limited area of habitable coastal plain. K-Ar dates for Ta’u reported by McDougal (1985) and revealing an age of 0.1 million years Before Present (B.P.) are consistent with the steep topography of the islands which contrasts the older, more eroded islands to the west.

Ta’u falls 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. Records from the airport on Tutuila (Nakamura 1984:Table 1) indicate a mean annual rainfall of 3100mm (124") (Nakamura 1964) ranging from a mean daily maximum of 85.4°F to a minimum of 74.6°F. Humidity is generally high during day and night ranging between 80 and 86 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 record can be found in the form of anomalous layers of gravel and rocks deposited by high energy storm surges. The effects of such storms on the prehistoric populations of Ta’u were certainly serious, as they have been in recorded history.

Yuncker (1945) lists 421 plant species for Manu’ a, both indigenous and introduced species. The distribution of vegetation zones on Ta’u is largely dependent on the amount of human disturbance which, in turn, is often limited by topography. Additional edaphic, microclimatic, and drainage conditions also have a lesser effect on vegetation distribution. Along the coastal plains and less steep slopes, human activity has significantly modified the natural
vegetation. Shifting gardens of taro (Colocasia esculenta), yam (Dioscorea alata), and other crops form a complex with secondary growth and stands of trees, mainly coconut (Cocos nucifera), breadfruit (Artocarpus communis), and banana (Musa sp.), dominate the lower elevations (Kirch 1993), many having been introduced with the first immigrants to the islands. A large marsh area at the northwest end of Ta’u Village, hypothesized to have been formed by the in-filling of a shallow embayment and formation of a broad dune ridge (Hunt & Kirch 1988), is well suited for intensive taro production. A leaf blight struck the taro crop throughout the archipelago in 1993 from which, at the time of the current study, the area was just beginning to recover. As a result, little taro cultivation was observed during the field season in areas normally under intensive cultivation. All of the current survey was conducted in the area deemed "managed land" (Atlas 1981).

Surrounding the coastal plains, further inland and at a higher elevation, is a zone of "disturbed forest" (Atlas 1981). Inland of the "disturbed forest" zone is a vast expanse of the original "montane" rain forest and, at higher elevations, cloud forest. The steep slopes and dense vegetation that comprise the majority of the inland area preclude any other than occasional utilization by humans.

Typical of island ecosystems, the fauna of Ta’u 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 indigenous mammal, the fruit bat (Pteropus samoensis). 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 most certainly more common in the past.

Nearly the entire island of Ta’u 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 lesser variety of fish, dolphins and, seasonally, whales.
Soils on the island belong to the Latosols classification. Typical of a geologically young island, the soils of Ta’u are undeveloped and generally shallow in parent materials of vitric-crystal ash, Lapilli tuff, alluvium, talus, and stream deposits. According to Nakamura (1984), the subject corridor passes through areas containing three major soil types. The majority of the corridor is covered with "Ofu variant silty clay" described by Nakamura as a deep, well-drained soil formed in volcanic materials. During the current investigations, the thickest soil layers were observed in the area of Site A5-11-59 at MACDOW Station 19+00 (unless otherwise stated all station designations refer to MACDOW plan stations). Here, the road cut indicated a depth approaching 2m. Further inland and higher in elevation, in the area of Stations 45+00 to 55+00, the silty clay extended only 20–50cm below the surface overlying a yellowish soft basaltic rock with a mottling of rust colored spots.

Less frequently the survey corridor passes through areas covered in Pavaiai stony clay loam. Described by Nakamura as a moderately deep, well-drained soil formed in volcanic ash underlain by lava. Boulders of volcanic parent material were frequently encountered within 1m depth in this soil type.

Kirch (1993) has developed a morphodynamic model of coastal terrace formation in relation to human occupation on Ofu that he believes is likely reflected on Ta’u due to their close proximity and similar geological age. 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 Ta’u, which being geologically younger than Ofu and likely to still be in a period of subsidence due to point loading on the earth’s crust, would be situated in a similar geomorphological location.

Kirch & Hunt (1988) suggest that coastal terrace progradation on Ta’u was accelerated by an increased sedimentary budget due to deforestation and clearing by human occupants. They believe this was especially important for the in-filling of a hypothesized shallow embayment and the formation of the marsh now located behind Ta’u Village and historically used for intensive taro production. Kirch’s morphodynamic model implies that the earliest archaeological deposits will be found at considerable depths, more likely in the former coastal terrace area and adjacent marshlands.
inland from Ta’u Village. This is supported by Hunt’s excavations as reported by Clark (1990). Clark notes that the test units excavated by Hunt on the highest point of the beach ridge and in an area adjacent to the marsh did not produce significant amounts of cultural remains and no pottery was recovered from these two test units.

Section 2.3: Location of the Subject Property

The Ta’u Road runs from Ta’u Village along the north coast of the island to the village of Fitiuta. The survey area covered in this report represents the first link (a portion of Road 1b of Phase I of the Ta’u Road Project) of construction determined by MACDOW site plans (American Samoa Government, Department of Public Works, Federal Aid Highway Project No. AS-NH-030 (4), 1994) (see Figure 2). The portion of Road 1b scheduled for construction begins at the intersection at Ta’u Village (MACDOW Station 10+00) and continues 1.4km (4500ft) from approximately 3.5m to 93.3m (11.5 to 306ft) above mean sea level (AMSL). The planned road has a right-of-way (ROW) corridor of 18.3m (60ft), approximately 9m (30ft) on either side of the centerline. The width of the road itself ranges between 3.6 and 4.5m (12 to 15ft). There is one portion of the road where the excavation and insertion of a box culvert is scheduled for drainage purposes. Otherwise, the construction of the road will closely follow the path of the existing road in this area. Methodology is described below and followed guidelines for cultural resource investigations in consultation with the American Samoa Historic Preservation Officer (ASHPO). This report and recommendations concern the road corridor for this segment of Road 1b including turn-around spots, temporary locations for equipment parking and storage, and quarries that will be utilized in the construction of the road.

Section 3: Literature Review

Section 3.1: The Samoan Archipelago

Writings concerning sites of an archaeological nature in the Samoan Archipelago can be traced back 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 alita) (Pritchard 1866; Turner 1884; 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
Figure 2: Subject Property on a U.S.G.S. Topographic Map

Road 1b (Por) Ta'u Road Reconstruction, Phase I

source: U.S.G.S. (Topographic) Map of Manua Islands American Samoa 1963
ethnic historic information of interest to the archaeologist. In the 1940’s, Freeman (1943, 1944a-c) described a number of archaeological sites. Using ethnic historic material, Watters (1956, 1958), a geographer, constructed a model of early Samoan settlement patterns.

Modern archaeology in Samoa began in the late 1950’s 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 and Holmer 1980). These surveys provided detailed information on settlement patterns, site types, artifact classes, and a complete chronology that placed initial occupation of the islands at ca. 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 MS 1970; Kikuchi, Silva and Palama MS 1975; Silva and Palama MS 1975; McCoy MS 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 & Kirch 1987, 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 in press; Clark, Wright, & Herdrich in review). In addition, beginning in 1989 enforcement of the National Historic Preservation Act of 1966 lead 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; Shapiro & Cleghorn 1994; Moore & Kennedy 1995).

Section 3.2: The Manu'a Group and Ta'u

Kramer (1902) visited the Manu'a Islands in 1898 providing some limited information on abandoned villages and noting a song that mentions the existence of pigeon catching mounds (tia seu lupe) on Ta'u. Buck 1930:322-24 also provides some information about Ta'u primarily about a raised road in Fitiuta. The first modern archaeological survey work on Ta'u was conducted by Kikuchi and Sinoto (Emory & Sinoto 1965) who excavated three test units, one in Mata'ana Cave (Site AS-11-34) near Faleasao Village and the other two at "cooking-house sites", also in Faleasao. In 1975, Kikuchi et al. (1975) conducted a compliance survey for the U.S. Army Corps of Engineers at the then proposed Ta'u Harbor between Fusi and Faganoto. They located several structures and recommended mitigation be carried out. Their recommendations were not acted on (Clark 1980:10). Clark (1980) visited the Manu'a group in 1980 and recorded 8 sites on Ofu, 8 sites on Olosega, and 50 sites in Ta'u.

In 1986, Hunt and Kirch (1988) carried out test excavations on all three islands as well as additional survey. Their excavations on Ta'u included 4 test units in Ta'u Village and coring in the marsh behind the Luma section of Ta'u Village. Their excavations provided information on the geomorphological history of the village (discussed above) and, with the discovery of pottery dating to 2,330±50 B.P., provided initial data that the village had some antiquity (Hunt and Kirch 1988:168-171). In 1987 and 1989 they focused their efforts on the To'aga site on Ofu by conducting extensive test excavations there (Kirch and Hunt 1993). Since Hunt and Kirch's 1986 work, Ta'u has been the subject of a series of compliance surveys, monitoring and limited excavations related to the Fitiuta Airport (Hunt 1987), the Ta'u Road (Clark 1990; Best 1992a) and the Faleasao Harbor (Foster 1991a-b). In addition, Herdrich and Clark conducted a brief hypothesis guided survey for star mounds in 1990 (Herdrich and Clark 1993).

Section 4: Methods

Section 4.1: Research Design

A thorough review of all materials available through the ASHPO concerning archaeological sites on Ta'u Island was
conducted prior to the current survey. This review revealed
that there are four known archaeological sites located along
the corridor of the project area: Ta’u Village itself (Site
AS-11-51) (Hunt & Kirch 1988, Clark 1990), and three small
coral scatters identified by Clark (Sites AS-11-59, 60, and
61) (1990). Reported sites within a kilometer of the research
area include three star mounds above Ta’u and Faleasao
Villages (Herrich & Clark 1993), six legendary sites in and
between Ta’u and Faleasao (Hunt & Kirch 1987; Clark 1990),
walls and platforms found near Ta’u Harbor by Kikuchi et al.
(1975—since destroyed, Clark 1980:10), a specialized site
above the Siufaga section of Ta’u Village (Hunt & Kirch 1987,
1988), ten legendary sites (including pools and a spring),
four historic sites, and the location of an artifact find
north of the project area along the road (Kikuchi 1963; Hunt

Archaeological work conducted in the Samoan archipelago
relates to a wide variety of research topics. The results of
the current work have relevance or potential relevance for
four specific research topics discussed below.

The first area of research interest has to do with
prehistoric ceramics. Green (1974) has argued that Samoa has
a continuous sequence of pottery which begins with Lapita
pottery, a decorated and statistically thin pottery found in
Upolu of Western Samoa. Pottery deriving from Lapita
continues through time changing to an undecorated and
statistically thicker pottery. Until recently it has been
believed that pottery production stopped around 200 A.D.,
Hunt and Kirch (1993) have found pottery at To’aga that dates
to 400-500 A.D., later than Green’s sequence. Hunt & Kirch
(1993) argue that their dates simply show a minor variation
and is of no consequence for Green’s general description of
the Samoan pottery sequence. Clark, however, (1993) has
excavated pottery in Aoa on Tutuila with C14 dates as late as
1400 A.D.

Clark’s dates are, however, at least 1000 years later
than Green’s and he raised a number of possibilities with
regard to Green’s sequence. First, it may be that there is
regional variation within the archipelago and that Green’s
sequence is generally correct, but certain communities such
as Aoa maintained their tradition longer (Clark 1993, 1994).
Secondly, Green (1974a-b) did have late dates from his
pottery sites, but interpreted pottery in late stratigraphic
contexts as having been pulled up by the prehistoric
excavation of posts and features. Clark, in a review of
radiocarbon dates and contexts for Samoa, argues that Green’s
interpretation exaggerated the extent of this uplifting
process (Clark 1994).

The second research topic has to do with the extent of
interisland trade of the material for stone tools. Recently,
a number of authors have conducted elemental analyses on stone tools found throughout the Pacific and on source rock from known quarries on Tutuila. Best et al. (1992) have shown that stone tools found in Tonga, Fiji, the Solomon Islands, the Tokelau Islands, and the Cook Islands have all originated from Tutuila quarries, and argue, in particular, that it originated from the quarry known as Tataga-matau near Leone. In addition, Weisler (in Kirch & Hunt 1993) has conducted analysis on stone tools in Manu’a and compared them to rock found at Tataga-matau. He concluded that 50% of the tools analyzed from Ta’u were from Tataga-matau.

Recently Clark, Wright, and Herdrich (in press) have conducted analyses of basalt from all the major quarries on Tutuila and a literature review. One of the findings from that analysis is that there is an overlap between the elemental percentages found in stone at different quarries so it may not be possible to pin-point exactly which quarry any given tool came from other than that it came from a particular island.

Research conducted by ACP at the Lau’agae Ridge Quarry, however, produced results which suggested that individual quarries may be able to be distinguished through trace element analyses (Moore & Kennedy 1995). Weisler had made similar suggestions following his analyses of stone from To’aga (in Kirch & Hunt 1993).

The third research focus concerns the distribution of star mounds (tia ‘ave) in Manu’a. Hunt & Kirch (1988:165-166) in their survey (which was primarily coastal) found no star mounds on the Manu’a Islands and made the strong claim that there were no star mounds anywhere on Ta’u or in Manu’a in general. Later Herdrich and Clark (1993) demonstrated that this was incorrect when they identified three star mounds above Ta’u and Paleasao. Based on this information, Herdrich and Clark (1993) claimed that the distribution pattern of star mounds, on either high ridge tops or in uninhabited lowland rainforest areas, found in the rest of Samoa could also be expected to be found on Ta’u. The star mound (Site AS-11-74) identified during the current investigations lends support to this hypothesis.

The final topic of concern is the pattern of settlement distribution. There has been very little survey of inland Ta’u. Previous research in Samoa has shown a settlement pattern that started with coastal settlement, the settlement system developed with the population moving inland until there was a shift, in the late prehistoric/early historic period, from inland settlements back to the coast (Davidson 1969, 1974). If this pattern holds for Manu’a there is the potential for the presence of inland settlements.
The purpose of the current investigations was to identify and evaluate potential historic and prehistoric archaeological sites within the ROW corridor for a portion of Road 1b of the Ta'ū Road Project 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. This research is important with regard to both territorial and regional research goals.

**Territorial Goals**

Territorial goals include the following:

1) Development of an inventory of historic and prehistoric archaeological sites.

2) Evaluation of historic and prehistoric sites relative to the criteria for the National Register of Historic Places.

3) Nomination of eligible properties to the National Register of Historic Places.

4) Protection of significant historic and prehistoric archaeological properties from significant negative impacts.

The research contained in this report contributes to these territorial goals in the following ways: 1) by conducting a systematic survey of the road corridor any historic or prehistoric sites within the corridor would be identified, 2) by conducting a systematic evaluation of sites identified in the current survey area, a determination of their significance relative to the National Register of Historic Places criteria will be made, 3) the evaluation of known sites is the first step in the process of nominating sites to the National Register of Historic Places, 4) an assessment of the impact of the road on sites identified as significant will be made and where necessary recommendations will be made for their protection. In addition, providing the location of significant archaeological sites will contribute to the protection of these sites in the event of future developments.

**Regional Goals**

Regional goals include the following:

1) Gaining an understanding of trade relationships between various island groups (Best et al. 1990; Weisler 1993; Clark, Wright, & Herdrich in review).

2) Polynesian Origins: Constructing a sequence of migration and colonization of island groups (Kirch & Green 1987).

3) Documenting settlement patterns as evidence of the evolutionary trajectory of island societies in order to gain understanding of evolutionary mechanisms effecting the development of societies throughout the
Pacific (Goldman 1970; Kirch 1984; Graves & Green 1993).

The research contained in this report contributes to these regional goals in the following ways: 1) The collected pottery and lithic material can be made available for analysis to determine whether they were of local origin or are made of exotic materials thereby indicating the existence and extent of interisland trade networks with these materials, 2) Future analysis of the inland pottery site identified during the current study (Site AS-11-73) may provide important evidence for understanding the sequence of migration and colonization in the Pacific, 3) The identification of an inland pottery site and star mound (Site AS-11-74) are important contributions in understanding the evolution of Samoan settlement patterns. A clearer understanding of Samoan settlement patterns will eventually lead to a better understanding of regional evolutionary mechanisms and trajectories.

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 pottery, basalt tools, and star mounds.

Section 4.2: Archaeological Methodology

The current investigations were conducted under the supervision of the Principal Investigator, Joseph Kennedy, M.A.. Field work was carried out by the Field Supervisor, Mr. David Herdrich, M.A. and Field Archaeologist Mr. Nicholas Kilzer, M.A. with the assistance of Taleni Lepolo and Ulutoa Taguto between January 31st and March 17th, 1995.

The research strategy used in the current investigations had two parts. First, an evaluation of known sites using shovel tests and excavation units where appropriate was conducted. Data collected included artifacts, soil samples, and charcoal samples, which would be relevant to any of the research goals and hypotheses outlined above. Secondly, a systematic shovel test survey was conducted to identify all of the archaeological sites present in the project area.

The strengths of the investigation include the following: 1) The survey to identify sites was intensive and systematic ensuring that all sites within the project area have been identified.
2) Evaluation of the sites identified was thorough. Sufficient data was collected from the sites in question to make sound and reasonable evaluations as to their significance and eligibility for placement on the National Register of Historic Places.

The limitations of the investigation include the following:
1) First and foremost this investigation was a compliance oriented project. Therefore, research was limited to the narrow corridor consisting of the road’s ROW. Had the investigations been guided only by research goals, the survey area would have had a wider scope and different survey techniques would have been used. In addition, Ta’u Village (Site AS-11-51) would have been tested with a larger number of 1m by 1m units along a systematic series of transects.

2) This compliance project was defined by the scope of work as Phase I (survey) and Phase II (evaluation) which limited the investigations to only conducting excavations for evaluation purposes. Once enough data was collected to evaluate a site it was not possible to collect additional data which would have contributed to answering purely research oriented questions.

Five methodological strategies will be described for five different aspects of the project. These aspects include: 1) evaluation of known sites, 2) survey of the road’s ROW corridor, 3) evaluation of the area near the intersection between Roads 1a and 1b, 4) survey of modern quarries, 5) documentation of an historic water catchment system formerly used by residents of Ta’u Village.

**Evaluation of Known Sites**

Prior to the current investigation, Clark (1990) had identified three small sites (AS-11-59, AS-11-60, and AS-11-61) along the roadway corridor (refer to Section 5.1: Figure 3). In his report, Clark refers to road construction station markers for reference in the location of the sites. The site plans he refers to, however, were those of G.M. Meredith and Associates (GMM), the engineering firm initially contracted to construct this phase of the road. The current site plans used by MACDOW, who now have the contract, do not correspond exactly to the GMM plans. Additionally, there are some inconsistencies in distances and elevational data in Clark’s report and the report alone is inadequate for re-identifying the locations of the sites described. Copies of the GMM site plans were unavailable during the current phase of field work. As a result, the initial location of the sites described by Clark were provided by Mr. Jim Barry, the MACDOW field manager who was familiar with both sets of site plans and had recorded the approximate locations.
For the purposes of this study, the methodology was to locate the approximate location of the sites and clear a large area of vegetation. Once cleared, the exact location of the site was determined by the location of coral scatters or other features described by Clark.

Having re-identified the sites, two perpendicular transects of shovel test pits (STP) were placed across the site bisecting the most dense concentration of artifacts or coral scatter. The STP's were spaced at 2m intervals and were excavated to a depth of 1m unless rock was encountered first. The soil from each STP was screened through 1/8" screen mesh, the STP's served three functions: 1) definition of the boundaries of the site (the boundary of a site was defined by encountering two consecutive negative STP’s). 2) determination of whether or not there were any subsurface artifacts present, 3) determination of whether or not there were any subsurface features or any significant stratigraphy present. If excavations recovered a significant type or number of artifacts or encountered extensive features or stratigraphy the evaluation was expanded to include a 1m by 1m excavation unit. If it was concluded that a 1m x 1m unit was not required, consultation was requested with the Territorial Archaeologist to ensure that he concurred with the determination made in the field.

Excavation of 1m x 1m test units was carried out in arbitrary 10cm levels within the natural stratigraphic layers. If a new layer was encountered within an excavation level, a new collection bag was used indicating the new layer but maintaining the present level until the next 10cm level was reached. Soil was screened through 1/8" screen-wire. All artifacts were collected and placed in labeled bags. When possible, charcoal samples and flotation samples from features were collected. Soil samples from each level were collected for soil color, and soil analysis. Level forms for each 10cm level were filled out. These forms include a description of the soil and notes on artifacts and features. In addition, the level forms have space for plan drawings of each level. Drawings of the wall profile were made. Photographs of each level and the wall profiles were taken. The excavation was stopped after two consecutive sterile levels.

Shovel Test Survey
Shovel test survey was used to discover subsurface cultural deposits and to determine the vertical and horizontal extent of such deposits when found. The placement of shovel tests was systematic with STP’s placed at 10m intervals on both sides of the road corridor. STP’s were excavated at a minimum of 0.3m diameter and 1m depth, unless rock was encountered at a lesser depth. Sediments were sieved through 0.25" screens. Soil profiles were recorded and all artifacts recovered were collected. Following
consultation with the ASHPO, STP’s were not placed in areas where there has been recent and extensive alterations to the landscape.

    When the excavation of an STP produced cultural material (a positive result), additional shovel tests were excavated to determine the boundary of the site. A STP was placed 5m in each direction surrounding the positive STP. The boundary of the site was determined following two consecutive negative result shovel tests.

**Intersection Evaluation: Backhoe Trench**

A backhoe was utilized to excavate a trench at the intersection of the road leading up from Ta’u Village toward Fitiuta Village (i.e. the intersection of Roads 1a and 1b). In consultation with the Territorial Archaeologist it was decided that the most efficient way to gain information about that area was to place a backhoe trench into a portion of the road and inland toward the cliff face. A second trench was proposed on the opposite (seaward) side of the road. The presence of a watermain and objection by the landowner, however, precluded this plan. The landowner did give permission for a 1m by 1m test excavation on the seaward side of the road. This unit, designated Test Unit X-1, is described below. The stratigraphy was examined, diagnostic artifacts were collected from the layers where present, and soil samples were taken from each layer. Photographs were taken and drawings were made of the wall profiles. Due to the fact that material coming from near the bottom of the trench was modern fill (described below) and after consultation with, and a site visit by, the Territorial Archaeologist a 1m x 1m sample column in the trench wall was foregone.

**Evaluation of Modern Quarries**

The scope of work required that investigations be carried out at all modern quarry sites utilized to obtain road building materials. MACDOW, at the time of the investigations, was using one previously opened quarry, referred to here as the Main Quarry. In addition, there were plans to re-open two other previously mined quarries, here referred to as numbers 1 and 2. All three quarries were located in areas of steep topographic relief which precluded using STP’s as a viable research method. Instead, pedestrian surveys were conducted at each quarry.

    With regard to the Main Quarry, McConnell-Dowell stated that the current boundaries of the quarry would not be exceeded. Nonetheless, a pedestrian survey was conducted utilizing four transects spaced ten meters apart along the boundaries of the quarry. In addition, based on previous experience, an examination of the nearby ridge top above the quarry was undertaken to determine if any sites such as terraces, star mounds, or fortifications existed. A star
mound (AS-11-74) was located and a scaled plan view, mapped using tape and compass, was drawn. No subsurface testing was conducted to evaluate the site because it was beyond the boundaries of impact for the quarry and because it is known that this class of sites is significant.

At Quarry 1 the area is so steep that it is highly unlikely that any sites exist. It is also so steep that pedestrian survey was difficult, but spot checking for evidence of a prehistoric quarry was conducted and one transect along an accessible part of the quarry was surveyed.

The area near Quarry 2 is in a steep and rugged talus slope area. MACDOW provided the field crew with the proposed dimensions of the quarry, approximately 100m x 60m. A pedestrian survey was then conducted utilizing four transect lines spaced approximately 15m apart paralleling the 100m length to provide full coverage of the quarry area.

Because Quarry 1 was located on a steeper grade than the Main Quarry or Quarry 2, it is believed that the methodologies described above were appropriate. The Territorial Archaeologist visited the quarries with the field crew and concurred with the methodology for each.

Village Water Tank and Catchment Pad

A village water tank (Site AS-11-75) located in a cliff face above the road at MACDOW station 16+00 is due for removal because it is in ruin and in danger of collapsing on to the road below. The Territorial Archaeologist requested that the structure be documented with a written description, a scaled plan view map, and photographs before the site was demolished. These tasks were performed by the field crew.

Section 5: Archaeological Findings

Section 5.1: Results of Investigations at Previously Identified Sites

SITE AS-11-59

Site AS-11-59, first identified by Clark (1990), is located about 30m from the bend in the road (Station 18+09) at exactly Station 19+00 (see Figure 3). Clark describes the site as a surface scatter of small coral ('ili 'ili) indicative of an old house floor about 2.4m (8ft) inland from the present road edge. No artifacts were found by Clark at this location.

After clearing a substantial amount of dense secondary vegetation just inland of Station 19+00, a light surface scatter of coral was observed along with a semi-circular alignment of basalt boulders, 10 to 30cm in diameter, alongside a modern umu (Samoan cooking hut) with a pig pen a
Figure 3: Site Locations

Road 1b (Por) Ta'u Road Reconstruction, Phase 1

source: R.M. Towill Corporation (sheet 69 & 70) 1990
few meters to the north (see Figures 4 and 5). The site is located 30m from MACDOW elevation control point #152 at exactly 34.66m (113.66ft) AMSL. There is a near vertical road bank of about 2m in height 1.5m inland (east) from the edge of the asphalt road. The terrain inland from the road bank is relatively flat at the location of the site at about 36m AMSL. The road bank was scraped and examined for artifacts. No artifacts or coral were observed in the road bank.

Two perpendicular shovel test transects were laid out. The first extended almost due east (80 degrees) from Station 19+00 at 2m intervals. This transect was labeled E1 through E7, with STP E7 placed 5m inland from STP E6, beyond the semicircle of boulders believed to represent the site boundary. A perpendicular transect that bisected STP E3 and 4 was labeled N1 through N5. STP N5 was placed 6m north of the previous STP due to the presence of the modern umu.

Soil at the surface was a dark brown silty clay loam grading into a brown silty clay at between 25 and 35cm below surface (cmbs) in depth. Soil profiles were uniform in color (10R 2.5/1) with only slight textural differences. No features were observed in any STP. Between 20-100 pieces of coral ('ili 'ili) were recovered from most STP units within the first 0-35cmbs. Large obstructive rocks were encountered in all STP's at depths less than 1m. A total of 4 basalt debitage flakes were recovered from the 12 STP units, none at a depth greater than 25cmbs, and most within the first 0-5cmbs. A single small fragment of burnt bone and several marine snail opercula were recovered from STP E4 and STP N4. The fragments did not appear old and were found at shallow depth in close proximity to a modern umu, thus, they were deemed not to be archaeological. The shovel test evaluation of this site indicates that the boundaries of the site do not extend more than 15m in any direction from the road.

SITE AS-11-60

Site AS-11-60 was identified by Clark (1990) as a diffuse scatter of coral 'ili 'ili where two basalt artifacts, a flake and an adze butt, were recovered. Initially, it was believed that the pottery-bearing site (Site AS-11-73 described below) represented this site as described by Clark and shown to the field crew by Mr. Jim Barry. This appears to have been in error due to a misinterpretation of the conversion from GMM station markers and MACDOW station markers by the former Territorial Archaeologist. As a result, Site AS-11-60 was rediscovered and evaluated in the course of the shovel test survey and not as part of the evaluation of known sites.

The actual location of Site AS-11-60 was discovered in the vicinity of STP's RS-E9 through RS-E16 (see Figure 5). It is a diffuse scatter of coral that is somewhat
Figure 5: Sites AS-11-59 and AS-11-60

KEY

- Evaluation Negative Test

⊕ Initial Negative Test

⊕ Initial Positive Test

→ Evaluation Positive Test

W West

E East

RS Road Station

Road 1b (Por) Ta' al Road Reconstruction Phase I

Archaeological Consultants of the Pacific, Inc. 1996
concentrated in the area of STP RS-E11 with basalt artifacts, several flakes and one adze, widely scattered over an area of approximately 60 square meters (200 sq. ft.). The site is located between MACDOW Stations 21+00 and 23+00. It is a relatively flat area above a road bank of approximately 1.5m, with plantation and dense secondary growth. There is a low rock wall approximately 15m inland of STP RS-E10 and runs in a straight line for 29m. The wall consists of two rows of basalt boulders 40cm wide. An informant told us that it is a boundary marker between two parcels of land. The intermittent presence of fencing wire indicates it is not very old. The site surrounds MACDOW elevational control point at 34.66m (113.68ft) AMSL.

Although shovel test evaluation was not conducted at 2m intervals as in the previous site, STP’s were placed at 5m intervals throughout the area of the site, and the boundaries of the site were defined both horizontally and vertically. Although there were several positive STP’s, significant artifacts were never recovered at depths greater than 20cm below the surface and no features were observed.

SITE AS-11-61
Site AS-11-61 was described by Clark (1990) as a surface scatter of coral 'ili 'ili about 4.3m inland from the edge of the road, immediately southwest of a small intermittent stream bed (see Figure 6). The site is located at approximately 49.9m (163.6ft) AMSL. Much of the area near the site was scheduled for excavation by MACDOW for the insertion of a box culvert and construction of a concrete road detour where the stream intersects the road. The area had been under cultivation with banana as well as surrounding secondary vegetation. After clearing a substantial amount of this vegetation, a moderate coral scatter was observed on the ground surface. The site is about 10m south of MACDOW station marker 33+00. The site is located 8-9m southwest of a concrete footbridge spanning the streambed which is in a state of disrepair but serves as a good point of reference.

A shovel test pit transect was laid out parallel to the road extending southwest from the southwestern corner of the footbridge and bisecting the highest concentration of coral. STP’s were excavated at 2m intervals labeled SW1 through SW7. A perpendicular transect was laid from the road edge bisecting STP’s SW5 and SW6. This transect was labeled SE1 through SE5 (see Figure 6).

Soil at the surface was brown silty clay loam (2.5YR 2.5/2). The profile for the STP’s was uniform in color with only a slight textural difference observed at depth with the soil becoming more clay-like. Large basalt boulders were frequently encountered between 50 and 85cmbs. Between 12-200 pieces of coral 'ili 'ili were identified within the first 0-40cmbs (but not collected), most within the first 15cmbs.
Some coral sand was apparent in the first 5-10cmbs where coral was most dense. Single basalt adze flakes were recovered from STP's SW2 at 52cmbs and SW5 at 15cmbs. Four basalt debitage flakes were recovered from STP SE4 at 0-20cmbs. A small bone fragment (unidentifiable) was recovered from STP SE3 within the first 0-5cmbs.

An arbitrary STP was placed 10m north of SW1 on the other side of the stream. Since road excavation was scheduled to begin the next day which would destroy the site and the immediate area surrounding it, this STP was placed to fully evaluate the culvert excavation zone. No artifacts or coral were recovered from this unit.

Upon completion of the shovel test evaluation of this site, consultations were conducted with the Territorial Archaeologist. He concurred with the determination that sufficient information had been retrieved from the site during the current investigations such that there was little potential to collect further information that would yield significant results. Therefore, permission was given for MACDOW to commence road work in this area. The next day, approximately half of the area of the site was excavated and filled with concrete to form a temporary road detour around the much deeper excavation of the culvert zone. The excavation was monitored by the two investigators. No additional artifacts or features were observed in the excavation zone.

Section 5.2: Results of Investigations at Sites Identified During the Current Study

SITE AS-11-73

The area of this site was shown to us by Mr. Jim Barry, and was initially believed to be Site AS-11-60 reported by Clark (1990). The site is located less than 2m inland of the east side of the road at MACDOW Station 33+00 (see Figures 3 and 7). There is a short driveway constructed of loose coral cobbles and small boulders about 4-5m south of the site. A house belonging to the landowner, Mr. Pa‘u Young is located 14m northeast of the coral scatter used to identify the site. The site is located in an area of secondary growth adjacent to Mr. Young’s front yard. There is a gently sloping road bank of about 0.5m elevation just inland from the road.

The coral scatter appeared to be concentrated near the sloping road bank and surrounding several boulders. One small broken basalt artifact was observed on the surface approximately 10m from MACDOW station 30+00. It is possible that much of the coral has been transported a short distance by rainwater runoff on the slope.

After clearing vegetation, a shovel test transect was laid out perpendicular to the road 1m south of MACDOW Station
marker 30+00 (approximately east-west) at 2m intervals bisecting the most dense concentration of coral. These were labeled E1 through E7.

Soil at the surface was a dark brown (10R 2.5/1) silty loam grading into a lighter brown (2.5YR 2.5/2) silty clay with gray clay peds at about 30cm below surface. Volcanic boulders were encountered within 70cm of the surface in all STP’s in this transect.

Between 100-500 pieces of coral were found between 0 and 20cmbs (not collected) in STP’s E1 through E5. Single, basalt debitage flakes were recovered from STP’s E1, E3, E6 and E7 at depths of between 20 and 50cmbs. At STP E7, a single piece (measuring 5.1 x 3.8cm and 1.3cm thick) of plainware pottery was recovered at 48cmbs. At this time, a perpendicular STP transect was laid out on either side of STP E7 at 2m intervals. This transect stretching approximately north to south was labeled N1 through N7. STP’s N4 and N5 produced pottery sherds at depths of between 30 and 50cmbs. Two large, cojoinable chunks of pottery were recovered from STP N4. These may represent a broken clay paddle used, in association with an anvil, in the production of pottery. Of the outlying STP’s, only N2 produced artifacts in the form of two small basalt flakes.

**Test Unit 73/1**

Having identified the approximate boundaries of the site with STP’s, it was determined that an additional 1m x 1m test unit excavation was warranted to fully evaluate the site and establish cultural deposits and recover a datable charcoal sample. A 1m x 1m test excavation was established approximately 1m southwest of STP E7 on a north-south axis. A surveyor’s level was used to establish ground elevation at the datum located at the northwestern corner of the unit. The site is located at 49.32m (161.76ft) AMSL calculated in relation to elevation control point #155 in the MACDOW site plans which is at 47.75m (156.60ft) AMSL. A level line was strung exactly 20cm above this datum. Depth measurements were recorded as below datum.

Excavation proceeded in arbitrary 10cm levels within identifiable strata. When a new stratigraphic layer was encountered the level was terminated regardless of thickness. The level was completed within the new layer, but as a new level, thus, the 10cm increments were maintained throughout the excavation. Sediments were screened through 1/8 inch mesh screens. The contents of each level were bagged separately. Photographs were taken at the completion of each level. Excavation was terminated at 60cm below datum (cmbd) when the excavation unit became occluded by large rocks.

Three stratigraphic layers and one feature were recorded in the test unit excavation (see Figure 8). Layer I is a
Layer I: 10R 2.5/1; Reddish black silty clay loam.
Layer IIa: 2.5 YR 2.5/2; Very dusky red clay.
Layer IIb: 2.5 YR 3/2; Dusky red silty clay.
dark brown silty clay loam (10R 2.5/1) extending 13 to 15cm below datum. It grades into a lighter brown (2.5YR 2.5/2) layer with a slightly higher clay content (Layer IIA) that extended 25 to 30cmbd. Layer IIB is a light brown (2.5YR 3/2) silty clay with large gray/brown clay pedds and many stones.

Nineteen basalt debitage flakes and one broken cutting edge of an adze were found from the surface to 15cm below datum in Layer I. Three pottery sherds and nine basalt flakes were found in Layer IIA at 15-30cmbd.

A large feature appeared within 30cm of the west wall of the test unit about 22cmbd and extending to 61cmbd. The feature is a dark brown (10YR 4/2) silty clay loam with very many stones and flecks of charcoal. This was excavated as a separate unit with two pottery sherds and four basalt flakes being recovered from this feature at a depth of between 30-40cmbd. The appearance of the feature is consistent with that of an umu or earth oven. Charcoal collected from the base of this feature (60cmbd) was sent to Beta Analytic for radiocarbon dating. This sample, once cleaned and treated, was too small for conventional dating and therefore required extended counting procedures. The results of this dating yielded a conventional radiocarbon age of 380+/−90 years B.P. calibrated to a most probable date range of AD 1401 through 1676 (at 2 sigma; according to Stuiver and Reimer, Radiocarbon Calibration Program Rev. 3.0.3, refer to Appendix B). Based upon the recovery of ceramic sherds of Samoan Plainware from within this feature, it was expected that a much earlier date would be returned. Based upon the age of the sample, though, it is likely that the umu feature was intrusive into a older cultural deposit located at the site. If the date reflects the age of deposition of the ceramic sherds, it would be evidence of the most recent use of pottery in eastern Polynesia so far. Before this date (which conflicts with the accepted ages for the use of pottery in Samoa) could be confirmed as the age of deposition of the ceramic material, though, additional testing would be required.

The soil directly below the feature is the same as that described for Layer IIA. Small features appeared in Level 3 and 4 (20 to 40cmbd), but they were shallow and irregular in shape, likely representing root molds. A small charcoal sample was obtained from Level 6 at 60cmbd.

This site is considered significant for two reasons. First, this site is the only know inland pottery site for all of Manu’a. Secondly, in being a pottery site with evidence of datable features it can contribute to our scientific understanding of Samoan prehistory.
Site AS-11-74: STAR MOUND

The star mound (fia ‘ave) is located on the northern edge of the volcanic crater behind the Main Quarry, approximately 5.6m from the edge (see Figure 3). It is at an elevation of approximately 129.5m (425ft) approximately 40m above a gradually ascending old trail that roughly follows a contour.

The mound is in poor condition having been subject to slumping and tree falls. It has four arms or projections which are oriented in north, west and south directions, but not to the east (see Figure 9). The eastern orientation is the back of the mound which rests against the face of the ridge slope. The arms or rays of the mound are composed of basalt boulders stacked in a series of courses. The height of the courses are as follows: ray #1, 4 courses high, 60cm above ground level (AGL); ray #2, 5 courses high, 80cm AGL; ray #3, 6 courses high, 120cm AGL; ray #4, 4 courses high 90cm AGL. The body of the mound appears to be a leveled off area with the arms placed to extend away from it. The variation in the height of the rays appears to be due to an attempt to keep the rays level with the mound body even though the slope drops off from the mound at slightly different angles. No artifacts were found on the surface on or near the mound.

The mound is considered a significant site since star mounds, in general, are considered a significant class of structures that have cultural value, dating from and contributing to our understanding of a particular period of Samoan prehistory (Herdrich 1991). In addition, these mounds contribute to the scientific understanding of settlement patterns (Herdrich and Clark 1993). Furthermore, it is significant in being the fourth star mound reported for Manu‘a; an area where it was previously believed that no star mounds existed (Hunt and Kirch 1988:165-166; Herdrich and Clark 1993).

Site AS-11-75: VILLAGE WATER CATCHMENT SYSTEM

A water catchment system consisting of a water tank and a concrete water catchment pad is located above the road that leads up to the village intersection before the road takes a hair-pin turn (see Figure 10). The water tank itself is across the road from MACDOW station 16+00.

The concrete pad of the catchment system is trapezoidal in shape, the eastern side measuring approximately 20m wide, the northern side 18m, the southern side 23m and the western side 27m. This sloped concrete pad acted as a catchment directing rain-water run off into the concrete water tank.

The water tank is in very poor condition; approximately 1/2 of it has collapsed. It measures 12m long by 3.5m wide and reached 2m deep. It is divided into two separate
Figure 9: Site AS-11-74

- Upslope Ridge
- Volcanic Crater
- Ray 1
- Ray 2
- Ray 3
- Slumped
- Ray 4

Scale: 0-2m
Direction: N
chambers by an internal wall. On the top of the tank is an opening into which the water flowed into both chambers. The roof of the tank is supported by four cross-beams, two for each chamber. Metal rebar is exposed in some of the cross beams and walls of the tank. The rebar exhibits ribbing. A metal water pipe is in evidence coming out of the bottom portion of the west wall of the northern half of the tank above and facing the road.

Various individuals in the village, none being older than 40 years of age, speculated that the tank had been built by U.S. Marines during World War II. The physical evidence of the tank does not support this. Structures built by the military in Samoa uniformly exhibit the use of a very distinctive aggregate of relatively large pieces of dark, fine grained basalt. Chuck Streck (personal communication), an archaeologist for the Army Corps of Engineers, states that this type of aggregate was used consistently throughout the Pacific on U.S. World War II era structures. The water tank does not have this type of aggregate. Instead the aggregate for the tank appears to be small stone pebbles and cobbles of varying sizes. Furthermore, a 91 year old Samoan woman who had spent her entire life in the village, told us that the water tank had been present prior to World War II and that it was her understanding that it has been build a few years after she was born around 1905-7. She said that it had been constructed as a village project.

Section 5.3: Results of Investigations at Locations to be Quarried

Main Quarry
The Main Quarry (see Figure 3) was surveyed using a pedestrian survey along transects and a reconnaissance of the ridge above it as described in the methodology section. No archaeological sites were discovered along the boundary area of the quarry covered by the four transects. The reconnaissance survey of the ridgetop resulted in the discovery of one star mound, Site AS-11-74, described above (refer to Section 5.2).

Quarry #1
This quarry is located along the western coast of Ta’u south of the Siufaga section of Ta’u Village (see Figure 3). The quarry is a near vertical cliff face which had previously been utilized. The site was visited, but due to the steepness of the cliff face it was decided that it was highly unlikely that any sites could exist there. One pedestrian transect was walked along the edge of the quarry and some spot checking in accessible areas was conducted. No artifacts or sites were found and none are expected to exist.
Quarry #2
This quarry is located east of Avatele Cove, just to the west of the archaeological site at Faga, AS-11-1 (see Figure 1). A previously utilized quarry exists at this location which covers an area measuring approximately 68m long by 30m wide. MACDOW plans to expand the quarry to encompass and area measuring 100m by 50m. The quarry is in a rugged talus slope area. The field crew surveyed the area by walking four transects spaced 15m apart along the 100m axis. An old road with cinder fill was found approximately 40m inland of the current road. No other sites were found in this area and it is highly unlikely that any exist under the talus at this location. The old road is not considered to be a significant site, but it's location will be incorporated in a map of Site AS-11-1 that is currently being produced (Personal Communication Lisa Shapiro).

Section 5.4: Results of Investigations at the Intersection of Roads 1a and 1b

Backhoe Trench
Backhoe testing was conducted at the location of the intersection of the road at the starting point of construction, MACDOW Station 10+00, where the Ta'u to Fitiuta road intersects with the road through Ta'u Village. This is the one portion of the road located within the main part of the village and in close proximity to known archaeological deposits of significant depth and age (Hunt 1988).

The trench was excavated about 1 meter south of MACDOW Station 10+18, the start point of road construction (see Figure 11). The excavation reached a maximum length of approximately 5.5m and 75cm in width. The trench extended 1.4m into the road itself and 4.1m inland towards steep cliffs approximately 20m further inland on the eastern side of the road along a compass bearing of 120 degrees. The trench was excavated at this location in order to examine the stratigraphy in the area overlapping the impact area of the road. Depth was recorded as below surface and related to MACDOW elevational control point #112 that is 3.65m (11.97ft) AMSL. The surface is approximately at the same level of MACDOW control point #113, 3.08m (10.13ft) AMSL.

The trench was excavated to a depth of approximately 2.5m where bright white calcareous sand was encountered. A shovel test was placed into this basalt layer which continued another 40cm in depth where the water table was encountered. Collapse of the northern wall of the trench made examination difficult. In addition, the stratigraphic sequences of the opposing walls varied, apparently due to numerous filling events. Thus, a profile was taken of the east and west walls of the trench (see Figures 12 and 13). The maximum extent of road fill was distinguished by a layer of dark reddish brown (2.5YR 3/3) scoria (cinder) ending 112cm below the surface.
Figure 12: Trench West Wall

Asphalt
Coral Concrete
Rubble, Coral Concrete
Compact Light Brown Clay with Rocks
2.5YR 3/3; Dark reddish brown scoria (cinder)
10YR 6/3; Pale brown sand.
10YR 3/2; Very dark grayish brown sand.
10YR 6/3; Pale brown sand.
10YR 3/3; Dark brown sandy clay.
10YR 2/1; Black sandy clay.
10YR 6/3; Pale brown sand.

White calcareous sand.
Figure 13: Trench East Wall

White Coral Concrete

5YR 3/4; Dark reddish brown sand with rocks.

10YR 3/2; Very dark grayish brown sand.

10YR 6/3; Pale brown sand.
10YR 3/2; Very dark grayish brown sand.
10YR 6/3; Pale brown sand.

10YR 3/3; Dark brown sandy clay.

10YR 2/1; Black sandy clay.

10YR 6/3; Pale brown sand.

White calcareous sand.

unexcavated

0
50
77cm

0
50
100
150
200
250
300cm

300cm
apparent in the west wall of the trench and thinning out and disappearing before the east wall of the profile. Immediately below the scoria layer was a layer of very dark grayish brown sand (10YR 3/2) 14cm thick, bounded above and below by a narrow (5cm) layer of pale brown (10YR 6/3) sand. This overlaid a 30-40cm thick layer of dark brown (10YR 3/3) sandy clay high in organic matter and recent historic artifacts (beer cans, glass, plastic). This graded into an almost black (10YR 2/1), mucky, sandy clay with large pieces of charcoal and additional recent historic artifacts (i.e., a toothpaste tube). Below this layer, at about 160cm below surface, was a layer of pale brown (10YR 6/3) culturally sterile, Ngdebus sand grading into sterile, white calcareous sand. No prehistoric or significantly ancient cultural layers were observed anywhere in the profiles. During interview with the landowner, Mr. Koke, he indicated that the area of the intersection had been plantation and swamp prior to construction of the current road (ca. 1960’s).

Test Unit K-1
To fully evaluate the potential for significant archaeological resources at the intersection (MACDOW Station 10+00), a 1m x 1m test unit was excavated off the road across from the backhoe trench. The test unit was placed on the seaward side of the road, 10m from the asphalt edge at the inland base of the beach berm and termed unit K-1, after the landowner, Mr. Koke (see Figure 11). The unit was placed in the space between two houses, one wrecked, on a gentle upward slope covered with coral and bright white calcareous sand. A datum was established at the northeast corner of the test unit 1.93m (6.32ft) AMSL as calculated with a surveyor’s level in reference to MACDOW elevational control point #112, 3.65m (11.97ft) AMSL. A level line was strung 20cm above this point. Depth measurements were recorded as "below line" (datum +20cm). Excavation followed the technique described for Test Unit 73/1 at Site AS-11-73.

Excavation was begun by clearing a layer, approximately 15cm thick, of coral and sand overburden to a uniform level of sediment. This overburden layer was not sieved. Five separate layers were observed in the test unit excavation and are described below (see Figure 14).

Layer I was observed immediately below the overburden. It was characterized by charcoal rich, densely packed coral chunks in a matrix of sticky, greasy black (2.5YR 2/0) calcareous sand. This sediment is consistent with that found in an umu, and, indeed, a small structure such as an umu is indicated on the ASPA maps of the area date 1971. The landowner, Mr. Koke Pomele, and High Chief Gooa, also indicated that there had been an umu at that location in the past. A line of coral boulders 20 to 40cm in diameter occurred at the top of this layer. Below the boulders, the layer extended approximately 50cm. Historic artifacts
Overburden: 10YR 4/1; Dark gray sand with coral.

Layer I: 2.5YR 2/0; Black sand with coral and fire cracked rock.

Layer II: 7.5YR 2/2; Very dark brown sand.

Layer IIIA: 10YR 3/3; Dark brown sand.

Layer IIIB: 10YR 3/2; Very dark grayish brown sand.

Layer IV: 10YR 3/3; Dark brown friable sand.

Layer V: 2.5Y 6/2; Light brownish gray calcareous sand.
(glass, nails, etc.) were recovered in this layer. A portion of a clay pipe stem was also recovered in this layer suggesting some antiquity.

Layer II was observed at about 67cm below surface as a very dark brown (7.5YR 2/2) sand with many coral chunks (3 to 7cm) and small cobbles. Layer II is drier, less compact, and not greasy as observed in Layer I. Two basalt debitage flakes and numerous shells, fragments, and opercula were recovered from this layer. No historic artifacts were recovered in this layer.

Layer III began at 87-98cm below surface and is divided into two subgroups, Layers IIIA and IIIB. Layer IIIA is a thin (12-16cm) layer of dark brown (10YR 3/3) dry, friable sand with much coral and shell. There is a "salt and pepper" like appearance at this layer due to decomposing coral and shell. Marine shell, sea urchin spines (unmodified) and a few fish bones were recovered from this layer, but no artifacts. Charcoal was not apparent.

Layer IIIB has the same "salt and pepper" appearance, only it is darker, being very dark grayish brown (10YR 3/2), somewhat more moist and less friable. It begins at 104-118cm and extends 25cm below surface. Charcoal flecks are apparent as is fire cracked rock. Three basalt debitage flakes were recovered from this layer with moderate amounts of marine shell and sea urchin spines.

Layer IV begins at about 108-111cm below surface. It is a dark brown (10YR 3/3) dry, friable sand with far less coral than previous layers. Three small (<20cm) oblong features, dark stains with some charcoal apparent, were observed surrounding a larger ash lens feature in the western 1/3 of the test unit. The 3 small features were shallow, about 2-4cm deep and did not appear to be post molds. The larger ash lens feature observed at the top of Layer IV at about 115cm below surface was composed of brown (10YR 3/1) sand with coral, charcoal, and large, whole marine shell shells. This feature was excavated as a separate unit and collected, without sieving, for flotation and charcoal extraction at a later date. Upon flotation, the charcoal sample recovered was not sufficient for dating. Marine shell, opercula, sea urchin spines, and some fish bones were recovered from Layer IV, but no artifacts. At about 135-140cm below surface Layer IV grades into Layer V.

Layer V is a light brownish gray (2.5Y 6/2) mottled, calcareous sand, very soft, dry, and friable becoming lighter with depth. Very little shell, bone, or sea urchin spines were apparent at this level which we believed to be the basal layer (as observed in the backhoe trench). At 145cm below surface, a shovel test pit was excavated an additional 50cm below the last level. The light tan sand continued, becoming
lighter with depth, until it was virtually white. At this point excavation was terminated.

The excavation of Test Unit K-1 indicates that potentially significant cultural layers do exist at depth in the area of the intersection. While this test unit produced little in the way of artifacts and a single feature, it still revealed evidence of human activity in the form of charcoal and humanly deposited coral (or ‘ili ‘ili). Furthermore, Hunt and Kirch (1988) have shown that the village area has a high potential for significant archaeological resources. Care and caution should be exercised when road work is done at this location, limiting deep excavation to within the boundaries of the road corridor.

Section 5.5: Results of Investigation Along the Road Corridor

Shovel Test Survey

In order to evaluate the potential for significant archaeological resources along the length of the road scheduled for construction, other than the previously identified sites, a systematic shovel test survey was conducted. The length of road covered by this survey extends approximately 1.37km (4500ft) from MACDOW Station 10+00 to 55+00. The length of road can be divided into two sections. The first, from Station 10+00 to 18+09 extends 243.92m (800ft) up a steep slope from the intersection at Ta‘u Village to a sharp bend at Station 18+00 (see Figure 3). The steep grade (approximately 20%) and near vertical dropoff on either side of the road at this portion make it extremely unlikely that archaeological resources would be located here. No shovel test pits (STP’s) were placed in this portion of the road corridor.

The second portion of the road, from Station 18+09 to 55+00, extends 1.12km (3691ft) along a 0-6% grade through mostly plantation land with secondary vegetation, although some portions were highly developed. This portion of the road was deemed more suited for shovel test surveying as described in the methodology. STP’s excavated in the lower section of the road, before the culvert located near Station 40+00, were prefixed with the designation "RS" while those located past the culvert were prefixed with the designation "AC".

One hundred eleven shovel test intervals were marked out on each side of the road for a total of 222 STP’s. Those STP’s which yielded positive results are presented in Table 8 of Appendix A. Although marked, a number of STP’s were not excavated in specific areas that were known to have been significantly altered or in-filled. These areas included a residential area, the MACDOW field office and equipment yard, and the area surrounding Manu’a High School and Gymnasium.
Although several STP's produced positive results, only one clear site was identified in the shovel test survey, that of Clark's (1990) original site AS-11-60, which had been previously misidentified (see Figure 5). Positive results usually consisted of 1 or more basalt flakes or a whole or partial tool. Coral 'ili ili was not considered a reliable indication of the presence of a site. Examination of excavations into the road surface conducted by MACDOW workers indicated that coral had been used as a base material in the old road and was eroding out. STP's nearly always produced some coral, especially in areas where the STP was placed downslope from the road. Unless an obvious, dense concentration of coral was observed, the STP was considered negative in the presence of artifacts or features.

The results of the shovel test survey indicate that there is a low probability of significant archaeological resources in the area of proposed road construction other than those described in this report. Artifact density in the area is low. This is consistent with the interpretation that in the past, as is the situation today, the area was used mainly for plantation with little in the way of substantial human occupation or other functions.

Section 6: Conclusions and Evaluations

The results of the Ta'u Road Phase I archaeological survey have been described in detail in the previous sections. Three previously known sites were evaluated for significance in terms of National Register of Historic Places criteria. In addition, three new sites were described and evaluated. A systematic shovel test survey was conducted to determine the potential for significant subsurface cultural resources. Areas that are currently being used, or are proposed locations of rock and base material quarries were also examined for cultural resources. Test excavation was conducted at two locations, one to fully evaluate Site AS-11-73, and the other (K-I) at the road intersection, both to identify the potential for significant archaeological resources at those locations. Finally, a backhoe trench was excavated to gain an understanding of the stratigraphy and relate it to the nature of the archaeological resources known for the area.

The recommendations for future action are given based on the existing road corridor indicated on the MACDOW site plans with no consideration of areas significantly beyond this corridor. It is assumed that vehicle turn-around spots and heavy equipment use and storage areas will remain as observed during the fieldwork, that is, restricted to the road corridor and the MACDOW field office and yard. Where the road passes through the village where cultural deposits are suspected at depth, it is also assumed that the depth of
disturbance below that of the previous road construction will be minimal.

The significance of the sites was determined by evaluating them relative to the general criteria for the National Register of Historic Places. If a site met one or more of the criteria it is deemed significant, otherwise it is not considered significant.

Where no sites were found, no additional investigation is recommended. A summary of the known sites and their significance evaluations are presented in Table 1. In addition, the following recommendations are made:

Site AS-11-59: This site consists of a former living surface which appears to have been minimally utilized. Based upon the site's morphological similarity to the other sites identified along the survey corridor and the date obtained from Test Unit 73/1 at Site AS-11-73, this site was likely utilized in the late pre-contact to early post-contact period. This site is considered significant for its information content (Criterion D of the National Register of Historic Places criteria). The current investigations have retrieved sufficient information from this site such that there is little potential to collect further information that would yield significantly different results than those recovered. It is recommended that the Federal Highway Administration make a determination that the Ta'u Road Reconstruction Project will have "no effect" on this significant historic site.

Site AS-11-60: This site represents one of only a few known inland habitation sites as well as an area of possible lithic tool manufacture (Clark 1990). As with Site AS-11-59, the current evaluations indicate that the site was likely utilized in the late pre-contact to early post-contact period. This site is considered significant for its information content (Criterion D of the National Register of Historic Places criteria). The current investigations have retrieved sufficient information from this site such that there is little potential to collect further information that would yield significantly different results than those recovered. It is recommended that the Federal Highway Administration make a determination that the Ta'u Road Reconstruction Project will have "no effect" on this significant historic site.

Site AS-11-61: This site also consists of a former living surface which was a location of minimal utilization which likely occurred in the late pre-contact to early post-contact period. This site is considered significant for its information content (Criterion D of the National Register of Historic Places criteria). It is recommended that the Federal Highway Administration make a determination that the
Table 1: Site Summary and Significance Evaluations

<table>
<thead>
<tr>
<th>Site</th>
<th>Description</th>
<th>Function</th>
<th>Significance Evaluations</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS-11-59</td>
<td>Coral Scatter</td>
<td>Hab</td>
<td>D</td>
</tr>
<tr>
<td>AS-11-60</td>
<td>Coral Scatter</td>
<td>Hab/IM</td>
<td>D</td>
</tr>
<tr>
<td>AS-11-61</td>
<td>Coral Scatter</td>
<td>Hab</td>
<td>D</td>
</tr>
<tr>
<td>AS-11-73</td>
<td>Coral Scatter</td>
<td>Hab</td>
<td>A &amp; D</td>
</tr>
<tr>
<td>AS-11-74</td>
<td>Star Mound</td>
<td>RR</td>
<td>D</td>
</tr>
<tr>
<td>AS-11-75</td>
<td>Water Tank</td>
<td>Hab</td>
<td>D</td>
</tr>
</tbody>
</table>

**Functional Interpretation**
- **LM** = Lithic Manufacture
- **RR** = Religious/Ritualistic
- **Hab** = Habitation

**Code For Significance Evaluation Criteria**
- **A** - Site Reflects Major Trends in History
- **B** - Site is Associated with the Life of a Significant Person
- **C** - Site Embodies Distinctive Characteristics
- **D** - Site Likely to Yield Important Scientific Data
road construction activities will have "an adverse effect" to this historic site. Following consultation with the ASHPO it was determined that sufficient information has been retrieved from this site such that there is little potential to collect further information that would yield significantly different results than those recovered.

Site AS-11-73: This site is the only known inland pottery site in Manu’a. The contribution of this site to knowledge of Samoan prehistory is substantial. Based upon the radiocarbon date obtained from Test Unit 73/1, this site is known to have been in use between the fifteenth to seventeenth centuries A.D. Because of the presence of pottery, it is likely that utilization of the site also occurred much earlier than the occupational event indicated by the radiocarbon date.

This site is considered significant for its information content (Criterion D of the National Register of Historic Places criteria) as well as, being a pottery bearing site, reflecting major trends in history (Criterion A of the National Register of Historic Places criteria). The most sensitive pottery bearing component of the site is located well inland of the road and, if current plans are strictly adhered to, it will not be impacted. It is recommended that the Federal Highway Administration make a determination that, for the purposes of the current road project, a finding of "no effect" is deemed appropriate. If some future subsurface construction project were to occur in the vicinity of this site, it is recommended that the appropriate mitigation measures be taken.

Site AS-11-74: This site consists of a star mound located above the main quarry. It is considered significant for its information content (Criterion D of the National Register of Historic Places criteria). Because the site is about 100m above the current limit of the quarry area, no impact on this site is anticipated as long as quarrying does not exceed the current elevation. It is recommended that the Federal Highway Administration make a determination that the Ta’u Road Reconstruction Project will have "no effect" on this significant historic property.

Site AS-11-75: The concrete water catchment located above MACDOW Station 16+00 is considered significant for its information content (Criterion D of the National Register of Historic Places criteria). It is recommended that the Federal Highway Administration make a determination that the road construction activities will have "an adverse effect" to this historic site. Following consultation with the ASHPO it was determined that sufficient information has been retrieved from this site such that there is little potential to collect further information that would yield significantly different results than those recovered.
Road Intersection (AS-11-51): The area of the road intersection, MACDOW Station 10+00 is considered significant because it is in the area of known archaeological resources (Site AS-11-51). No impact at this location will occur as long as road work does not exceed the zone of excavation of the existing road, approximately 1.12m depth.

In summary, the current investigations have documented both previously and newly identified sites of historic significance located along the project corridor and in the vicinity of locations which are to be utilized during construction activities associated with the Ta‘u Road Reconstruction Project. These sites have been evaluated in accordance with criteria established by the Advisory Council on Historic Preservation and recommendations for determinations have been made concerning the effects of the proposed project.
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Sterndale, R.A.


Stice, G.D., & F.W. McCoy


Thompson, Andrew


Turner, G.

Watters, Raymond F.


Williams, J.


Yuncker, T.G.

APPENDIX A

Tables
Table 2: Artifacts Recovered from Sites AS-11-59, AS-11-60 & AS-11-61

<table>
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<tr>
<th>Site</th>
<th>Shovel Test Pit</th>
<th>Depth (cm/bd)</th>
<th>Material</th>
<th>Object</th>
<th>Description</th>
<th>Weight (g)</th>
<th>Size (cm)</th>
<th>Ct.</th>
<th>Comments</th>
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<td>Nominal flake, percussion bulb?</td>
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<td>1 with smooth edge</td>
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RS = Road Survey, N = North, E = East, S = South, W = West
Table 3: Artifacts Recovered from STP Transects at Site AS-11-73

<table>
<thead>
<tr>
<th>Shovel Test Pit</th>
<th>Layer/Level</th>
<th>Depth (cm)</th>
<th>Material</th>
<th>Object</th>
<th>Color</th>
<th>Description</th>
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<td>Appears unworked</td>
<td></td>
<td>4.0</td>
<td></td>
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</tr>
<tr>
<td>E3</td>
<td>I</td>
<td>20</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Appears rough, unworked</td>
<td></td>
<td>3.0</td>
<td>3.2</td>
<td>1</td>
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<td>E3</td>
<td>I</td>
<td>25</td>
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<td>Appears to be unworked</td>
<td></td>
<td>1.5</td>
<td>2.5</td>
<td>1</td>
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<tr>
<td>E7</td>
<td>II</td>
<td>40</td>
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<td>6.1x3.8x1.3</td>
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<td>E7</td>
<td>II</td>
<td>50</td>
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<td>Nominal</td>
<td></td>
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<td>1.3</td>
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<td>N2</td>
<td>I</td>
<td>10-15</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Smooth edge</td>
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<td>2.5</td>
<td></td>
<td>2</td>
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<td>N4</td>
<td>II</td>
<td>45</td>
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<td>117.6</td>
<td>7.6x5.1x3.8</td>
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<td>Seems to join pc. below</td>
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<td>II</td>
<td>45</td>
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<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>56.5</td>
<td>5.7x3.2x1.2</td>
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<td>Seems to join pc. above</td>
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<td>II</td>
<td>34</td>
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<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
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<td>6.8x3.5x1.3</td>
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<td>N5</td>
<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>8.5</td>
<td>3.2x1.9x1.3</td>
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<td>N5</td>
<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>9.0</td>
<td>3.2x2.5x1.3</td>
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<td>N5</td>
<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>5.0</td>
<td>3.2x2.6x0.6</td>
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<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>5.0</td>
<td>2.5x1.9x0.6</td>
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<tr>
<td>N5</td>
<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>1.0</td>
<td>1.3x1.3x0.6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>N5</td>
<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>1.5</td>
<td>1.3x1.3x0.6</td>
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<tr>
<td>N5</td>
<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>0.5</td>
<td>1.3x0.6x0.6</td>
<td>1</td>
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<tr>
<td>N5</td>
<td>II</td>
<td>34</td>
<td>Ceramic</td>
<td>Sherd, dust</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
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Table 4: Artifacts Recovered from Test Unit 73/1

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<th>Excavation Unit</th>
<th>Layer/Level</th>
<th>Depth (cm bd)</th>
<th>Material</th>
<th>Object</th>
<th>Color</th>
<th>Description</th>
<th>Weight (g)</th>
<th>Size (cm)</th>
<th>Qt.</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Test Unit 73/1</td>
<td>I/1</td>
<td>0-10</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td></td>
<td>Potentially adze, 2 smooth sides</td>
<td>8.5</td>
<td>0.1</td>
<td>1</td>
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<tr>
<td>Test Unit 73/1</td>
<td>I/1</td>
<td>0-10</td>
<td>Basalt</td>
<td>Lithic flakes</td>
<td></td>
<td>Worked</td>
<td>19.0</td>
<td></td>
<td>11</td>
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<tr>
<td>Test Unit 73/1</td>
<td>II/2</td>
<td>10-15</td>
<td>Basalt</td>
<td>Lithic flakes</td>
<td></td>
<td>Waste flakes</td>
<td>34.0</td>
<td></td>
<td>7</td>
<td></td>
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<tr>
<td>Test Unit 73/1</td>
<td>II/2</td>
<td>15-20</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>5.0</td>
<td>3.2 x 1.3 x 1.3</td>
<td>1</td>
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<td>Test Unit 73/1</td>
<td>II/3</td>
<td>20-30</td>
<td>Basalt</td>
<td>Lithic flakes</td>
<td></td>
<td>Waste flakes</td>
<td>7.0</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Test Unit 73/1</td>
<td>II/3</td>
<td>20-30</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>2.0</td>
<td>1.3 x 1.3 x 0.6</td>
<td>1</td>
<td></td>
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<tr>
<td>Test Unit 73/1</td>
<td>II/3</td>
<td>20-30</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>2.0</td>
<td>1.3 x 1.3 x 0.6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>T.U. West Feature</td>
<td>II/3</td>
<td>30-40</td>
<td>Basalt</td>
<td>Lithic flakes</td>
<td></td>
<td>Worked flakes, 1 smooth edge</td>
<td>10.0</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>T.U. West Feature</td>
<td>II/3</td>
<td>30-40</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>5.0</td>
<td>2.5 x 1.3 x 0.6</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>T.U. West Feature</td>
<td>II/3</td>
<td>30-40</td>
<td>Ceramic</td>
<td>Sherd</td>
<td>Brownish-orange</td>
<td>Samoan Plainware</td>
<td>1.5</td>
<td>1.8 x 1.3 x 0.8</td>
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## Table 5: Artifacts Recovered from Test Unit K-1

<table>
<thead>
<tr>
<th>Layer/Level</th>
<th>Depth</th>
<th>Material</th>
<th>Object</th>
<th>Color</th>
<th>Description</th>
<th>Weight (g)</th>
<th>Size (cm)</th>
<th>Ct.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>30-45</td>
<td>Echnodorn</td>
<td>Abandon?</td>
<td>Rounded</td>
<td>Hole at one end and deep groove 1cm below hole</td>
<td>1.0</td>
<td>1.3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coral</td>
<td>Sinker or weight?</td>
<td>Red</td>
<td>Multi-faceted round bead with hole through center</td>
<td>3.5</td>
<td>1.3</td>
<td>1</td>
</tr>
<tr>
<td>Metal</td>
<td></td>
<td>Nails</td>
<td>Rusted</td>
<td>2.5 to 8.9 cm in length, 1.5 to 10.9 g in weight</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass</td>
<td></td>
<td>Sherds</td>
<td>Dark brown (2)</td>
<td>Size range: 1.3 to 3.8 cm, Weight range: 0.5 to 5.5 g</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceramics</td>
<td></td>
<td>Sherds</td>
<td>White</td>
<td>1.5</td>
<td>1.3</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceramics</td>
<td></td>
<td>Sherds</td>
<td>White</td>
<td>3.0</td>
<td>2.5</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marble</td>
<td></td>
<td>White/purple</td>
<td>White/purple swirls</td>
<td>Rounded, broken</td>
<td>1.5</td>
<td>1.3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Particle</td>
<td></td>
<td>board</td>
<td>Light brown</td>
<td>Pressed board, size range: 1.3 to 3.8 cm, weight range: 0.5 to 1.9 g</td>
<td>4</td>
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<td></td>
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</tr>
<tr>
<td>Copper</td>
<td></td>
<td>Boat nail &amp; washer</td>
<td>1 square-ended (both ends) nail with round washer attached, 1 washer</td>
<td>7.5</td>
<td>5.1</td>
<td>3</td>
<td></td>
<td></td>
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<tr>
<td>L2</td>
<td>45-55</td>
<td>Basalt</td>
<td>Appears unworked</td>
<td>2.5 to 6.4 cm, weight range: 2.0 to 15.5 g</td>
<td>5</td>
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<td></td>
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<tr>
<td>Glass</td>
<td></td>
<td>Sherds</td>
<td>Clear</td>
<td>Thick</td>
<td>6.5</td>
<td>5.1</td>
<td>1</td>
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</tr>
<tr>
<td>Metal</td>
<td></td>
<td>Nail</td>
<td>Rusted</td>
<td>Heavily encrusted</td>
<td>4.5</td>
<td>5.1</td>
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<tr>
<td>I/3</td>
<td>55-65</td>
<td>Glass</td>
<td>Clear</td>
<td>Thin</td>
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<td>2.5</td>
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<tr>
<td>Sherds</td>
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<td>Clear</td>
<td>Thick</td>
<td>2.5</td>
<td>2.5</td>
<td>1</td>
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<td>Sherds</td>
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<td>Clear</td>
<td>Thin</td>
<td>2.5</td>
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<tr>
<td>Metal</td>
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<td>Nail</td>
<td>Rusted</td>
<td>Heavily encrusted, whole nail</td>
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<td>10.2</td>
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<td>Basalt</td>
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<td>Basalt</td>
<td>Possible adze fragment with at least one polished edge</td>
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<td>2.5</td>
<td>1</td>
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<tr>
<td>Plastic</td>
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<td>Sherds</td>
<td>White</td>
<td>0.5</td>
<td>2.5</td>
<td>2</td>
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<tr>
<td>I/5</td>
<td>75-85</td>
<td>Basalt</td>
<td>Lithic flakes</td>
<td>Size range: 1.3 to 3.8 cm</td>
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<td>Kelin clay</td>
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<td>Clay</td>
<td>White</td>
<td>Impressed &quot;...SON&quot; on 1 side, &quot;GLA...&quot; on other, 1/16&quot; bore hole</td>
<td>2.5</td>
<td>2.5</td>
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<td>I/6</td>
<td>65-75</td>
<td>Basalt</td>
<td>Lithic flakes</td>
<td>Weight range: 4.5 to 7.5 g, one flake seems to have 2 worked edges</td>
<td>approx. 3.8</td>
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<td>IIIb/8</td>
<td>115-125</td>
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<td>7.5</td>
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<td>Lithic flakes</td>
<td>0.3</td>
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<td>U4</td>
<td>U5</td>
<td>U6</td>
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<td>Turritopsis sp.</td>
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<td>163.0</td>
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<td>27.0</td>
<td>43.0</td>
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<td>Strombus sp.</td>
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<td>HEPATOPITIOPHYTA sp.</td>
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<td>Sphygmodon sp.</td>
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*Wall Scrapings

All results in weight by grams. T=Trace (>0.5g)
Table 7: Analysis of Faunal Material Recovered from Test Unit K-1

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<th>Test Unit</th>
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<td>IV/10</td>
<td>IV/11</td>
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All results in weight by grams.
Table 8: Artifacts Recovered from Road Survey

<table>
<thead>
<tr>
<th>Shovel Test Pit</th>
<th>Depth (cm/mb)</th>
<th>Material</th>
<th>Object</th>
<th>Description</th>
<th>Weight (g)</th>
<th>Size (cm)</th>
<th>CL</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-E20</td>
<td>6</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Worn?</td>
<td>0.5</td>
<td>2.5</td>
<td>1</td>
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<tr>
<td>RS-E21</td>
<td>8</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Percussion bulb?</td>
<td>2.0</td>
<td>2.5</td>
<td>1</td>
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<tr>
<td>RS-E43</td>
<td>35</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>3 smooth sides</td>
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<td>1</td>
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</tr>
<tr>
<td>RS-W2</td>
<td>35</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Nominal flake w/ percussion bulb</td>
<td>3.5</td>
<td>3.0</td>
<td>1</td>
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<tr>
<td>RS-W2</td>
<td>78</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Flake with polished edge</td>
<td>10.0</td>
<td>4.3</td>
<td>1</td>
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<td>RS-W4</td>
<td>20</td>
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<td>Lithic flake</td>
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<td>11.0</td>
<td>3.8</td>
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<td>RS-W11</td>
<td>0-5</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Rounded edge</td>
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<td>2.5</td>
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<td>RS-W12N1</td>
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<td>Lithic flake</td>
<td>Transported</td>
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<td>3.8</td>
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<tr>
<td>RS-W20</td>
<td>52</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Worked, use?</td>
<td>17.8</td>
<td>7.6</td>
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<tr>
<td>RS-W20/S1</td>
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<td>Basalt</td>
<td>Lithic flakes</td>
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<td>7.0</td>
<td></td>
<td>7</td>
<td>includes 1 bone</td>
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<td>AC-E3</td>
<td>25</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Nominal</td>
<td>3.0</td>
<td>2.5</td>
<td>1</td>
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<td>AC-E5</td>
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<td>Lithic flake</td>
<td>Normal</td>
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<td>3.8</td>
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<td>AC-E68</td>
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<td>Basalt</td>
<td>Lithic flake</td>
<td></td>
<td>13.5</td>
<td>5.1</td>
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</tr>
<tr>
<td>Roadside Wash, Surface, Near Sta 25-60</td>
<td>Basalt</td>
<td>Lithic flakes</td>
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<td>30.0</td>
<td>2</td>
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</tr>
<tr>
<td>Roadside Wash, Surface, Near Sta 23-60</td>
<td>Basalt</td>
<td>Lithic flakes</td>
<td></td>
<td>88.0</td>
<td>6.4</td>
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</tr>
<tr>
<td>In-Road Cut*</td>
<td>45 AR</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Possible Type II adze (Green 1969:23-24)</td>
<td>48.0</td>
<td>6.4</td>
<td>1</td>
<td>Between STP-E16 &amp; E17 (1969:23-24)</td>
</tr>
<tr>
<td>In-Road Cut*</td>
<td>70 AR</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Possible chisel</td>
<td>76.0</td>
<td>11.4</td>
<td>1</td>
<td>Between STP-E16 &amp; E17</td>
</tr>
<tr>
<td>In-Road Cut*</td>
<td>50-70 AR</td>
<td>Basalt</td>
<td>Lithic flake</td>
<td>Worked</td>
<td>39.0</td>
<td>8.9</td>
<td>1</td>
<td>Between STP-E12 &amp; E13</td>
</tr>
</tbody>
</table>

STP=Shovel Test Pit, AR=Above Road, N=North, E=East, S=South, W=West
APPENDIX B

Radiocarbon Dating Results
FOR: Mr. Joseph Kennedy  
ARCHAEOLOGICAL CONSULTANTS OF HAWAII, INC.

DATE RECEIVED: Aug. 29, 1995  
DATE REPORTED: July 7, 1995

<table>
<thead>
<tr>
<th>Sample Data</th>
<th>Measured C14 Age</th>
<th>C13/C12 Ratio</th>
<th>Conventional C14 Age (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta-82354</td>
<td>430 +/- 90 BP</td>
<td>-27.8 o/oo</td>
<td>380 +/- 90 BP</td>
</tr>
</tbody>
</table>

SAMPLE #: AS-11-73/1:W 60cmbd  
ANALYSIS: radiometric-standard  
MATERIAL/pretreatment: (charred material): acid/alkali/acid  
COMMENT: the small sample was given extended counting time

NOTE: It is important to read the calendar calibration information and to use the calendar calibrated results (reported separately) when interpreting these results in AD/BC terms.

NOTE: One additional sample, AS-11-51/K1 L4/11 136cmbd, was cancelled as requested.

Dates are reported as RCYBP (radiocarbon years before present, "present" = 1950 A.D.). By international convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid & calculated using the Libby C14 half-life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) & are based on combined measurements of the sample, background, and modern reference standards.  

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 ppm, if the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the conventional C14 age.
CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = 27.8; lab mult. = 1)

Laboratory Number: Beta-82354

Conventional radiocarbon age: 380 +/- 90 BP

Calibrated results: cal AD 1410 to 1670 and
cal AD 1780 to 1795 and
cal AD 1945 to 1950

Intercept data:

Intercept of radiocarbon age
with calibration curve: cal AD 1485

1 sigma calibrated results: cal AD 1435 to 1645

References:

*Pietzka Calibration Curve for Short Lived Samples*

*A Simplified Approach to Calibrating C14 Dates*

*Calibration - 1993*
Radiocarbon Age BP 380 ± 90
Calibrated age(s) cal AD 1489
Reference(s) (Stuiver and Becker, 1993)

Cal AD/BC age ranges obtained from intercepts (Method A):

one Sigma** cal AD 1437 - 1645
two Sigma** cal AD 1407 - 1572 1781 - 1799
1945 - 1953

Summary of above:

minimum of cal age ranges (cal ages) maximum of cal age ranges:

1σ cal AD 1437 (1489) 1645
2σ cal AD 1407 (1489) 1953

cal AD/BC age ranges (cal ages as above)
from probability distribution (Method B):

% area enclosed cal AD age ranges relative area under
probability distribution

68.3 (1σ) cal AD 1444 - 1530 .53
1555 - 1633 .47
95.4 (2σ) cal AD 1334 - 1338 .00
1401 - 1676 .97
1777 - 1803 .02
1941 - 1955* .01

References for datasets used:

Comments:
+This standard deviation (error) includes a lab error multiplier.
** 1 sigma = square root of (sample std. dev.² + curve std. dev.²)
  2 sigma = 2 x square root of (sample std. dev.² + curve std. dev.²)

* represents a "negative" age BP
1955* denotes influence of bomb C-14
For cal yrs between 5500-5190 BC an offset of 25 years is possible.
NOTE: Cal ages and ranges are rounded to the nearest year which
may be too precise in many instances. Users are advised to
round results to the nearest 10 yr for samples with standard
deviation in the radiocarbon age greater than 50 yr.