Section 4 Previous Archaeological Research

The following discussion of previous archaeological studies and finds pertaining to the HHCTCP Airport (Phase 3) project area is presented in terms of four geographic areas: Hālawa Ahupua‘a, the intensively studied former Hickam and Fort Kamehameha lands, the special case of the H-3 Archaeological studies and studies in Moanalua Ahupua‘a.

4.1 Hālawa Ahupua‘a Previous Archaeological Research

4.1.1 Early Archaeological Research at Hālawa

The first recorded sites at Hālawa were documented during the pioneering attempt at a comprehensive survey of archaeological sites on the island of O‘ahu by J. Gilbert McAllister of the Bishop Museum in the 1930s.

McAllister (1933:101-102) recorded 10 sites (nine coastal fishponds and Ford Island – known to the Hawaiians as Moku ‘ume‘ume) within Hālawa Ahupua‘a, giving their approximate locations and describing their conditions at the time of the survey (Figure 23). The sites include the following:

> Site 94 Loko Waiaho
>
> Loko Waiaho, known as Queen Emma’s pond, was located near Watertown. The walls were of coral and sand, 6.5 feet wide, 2 feet high, with five outlets (*mākāhā*). It covered an area of 32 acres. (McAllister 1933:101)
>
> The former Loko Waiaho lies near the east side of the entrance to Pearl Harbor approximately 2.1 miles (3.4 kilometers) southwest of the nearest point of the HHCTCP Airport (Phase 3) project area.
>
> Site 95 Loko Ke‘oki
>
> Loko Ke‘oki was a pond near the present site of Watertown in Hālawa. It had narrow wall of coral rock and sand. It has been filled in. (McAllister 1933:101)
>
> The former Loko Ke‘oki also lies near the east side of the entrance to Pearl Harbor approximately 2.1 miles (3.4 kilometers) southwest of the nearest point of the HHCTCP Airport (Phase 3) project area.
>
> Site 96 Papiolua fishpond
>
> Papiolua fishpond was located in Hālawa opposite the tip of Waipi‘o Peninsula. It was a small pond, about 1 acre in area with a wall 150 feet long, 4 feet wide and high. There were no outlet gates (*mākāhā*). (McAllister 1933:101)
>
> The former Papiolua fishpond lies on the east side of the entry channel into Pearl Harbor approximately 2.0 miles (3.2 kilometers) west of the nearest point of the HHCTCP Airport (Phase 3) project area.

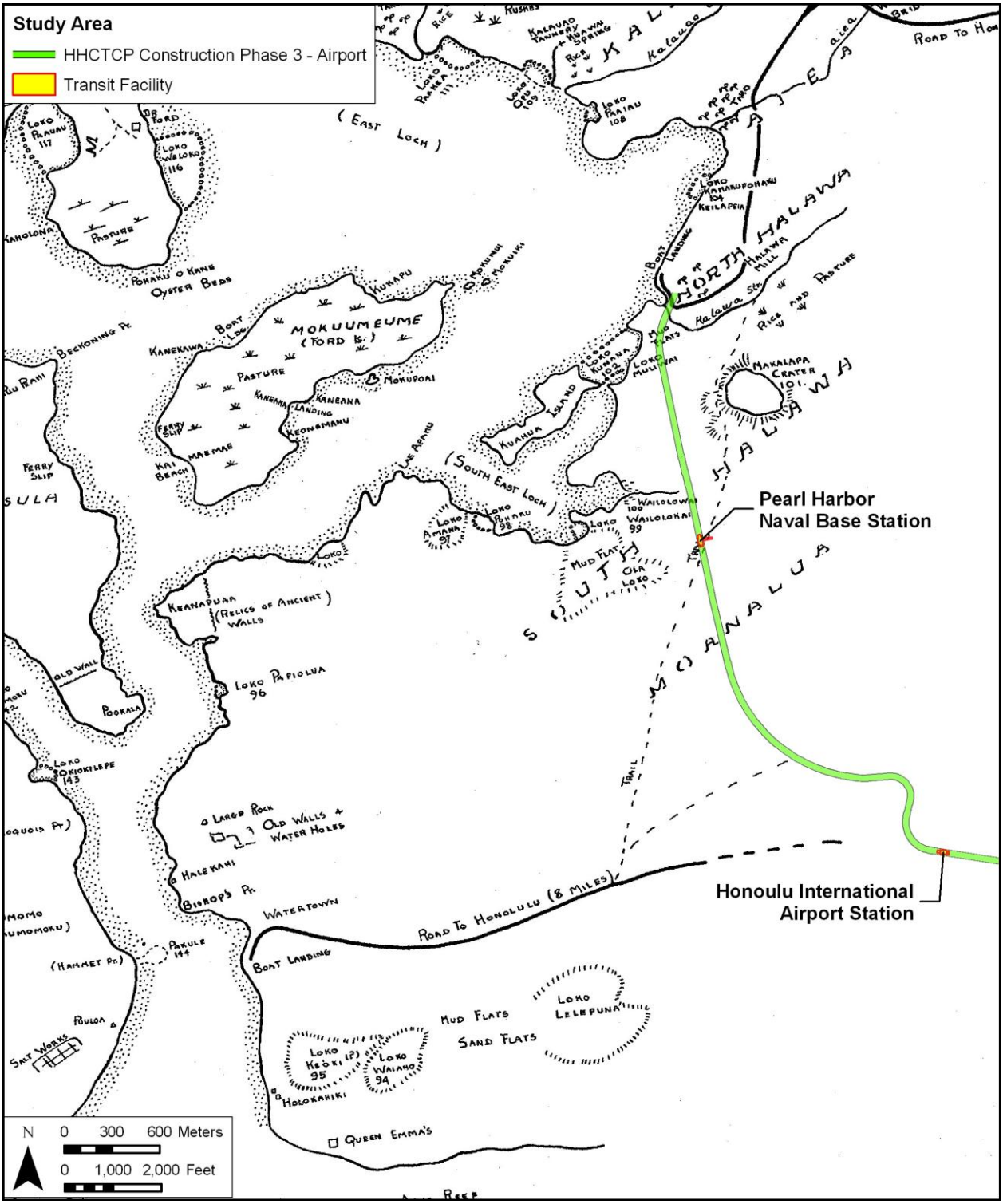

Figure 23. Map showing location of McAlister designated sites in the vicinity of the Hālawa portion of the current project area (adapted from Sterling and Summers 1976)

Site 97 Loko-a-Mano or Loko Amana

Loko-a-Mano or Loko Amana, filled in before 1900, was located at the present site of the Navy yard. (McAllister 1933:102)

Loko-a-Mano lies on the south side of the Southeast Loch of Pearl Harbor approximately 1.1 miles (1.8 kilometers) west of the nearest point of the HHCTCP Airport (Phase 3) project area.

Site 98 Loko Pōhaku

Loko Pōhaku was a small pond of 2.5 acres at the present site of the Navy yard. (McAllister 1933:102)

Loko Pōhaku lies on the south side of the Southeast Loch of Pearl Harbor approximately 1.0 miles (1.6 kilometers) west of the nearest point of the HHCTCP Airport (Phase 3) project area.

Site 99 Waiolokai fishpond

Waiolokai fishpond was another very small pond at Hālawa. (McAllister 1933:102)

Waiolokai fishpond lies on the southeast side of the Southeast Loch of Pearl Harbor approximately 0.4 miles (640 meters) west of the nearest point of the HHCTCP Airport (Phase 3) project area.

Site 100 Wailolowai fishpond

Possibly the site of Wailolowai fishpond. (McAllister 1933:102)

Waiolowai fishpond lies on the southeast side of the Southeast Loch of Pearl Harbor approximately 0.4 miles (640 meters) west of the nearest point of the HHCTCP Airport (Phase 3) project area.

Site 101 Makalapa Crater

Makalapa Crater, now being used for a freshwater pond. Believed to be recent. (McAllister 1933:102)

Makalapa Crater lies adjacent to the east side of the HHCTCP Airport (Phase 3) project area just south of Hālawa Stream (the crater rim is approximately 300 m east of the Kamehameha Highway alignment).

Site 102 Loko Kunana and Loko Muliwai, between Hālawa and Kuahua Island.

Kunana has been partly filled in but was formerly 25 acres in extent. Kuahua island forms one side and the opposing wall is formed Hālawa. The two walls running between the land and the island are 1800 feet and 1950 feet long, approximately 5 feet wide, and 3 feet high. Loko muliwai is only 4 acres in extent, a portion of which has been filled. Its wall is 500 feet long with one outlet (*mākāhā*). (McAllister 1933:102)

Loko Kunana and Loko Muliwai lie adjacent to the east side of the East Loch of Pearl Harbor just south of Hālawa Stream a quarter mile (400 meters) west of the nearest point of the HHCTCP Airport (Phase 3) project area.

Site 103 Moku‘ume‘ume Island (Ford Island), Pearl Harbor [Note some sources place Moku ‘ume‘ume within Waimalu Ahupua‘a].

Said to have obtained its name “Isle of Strife” from the fact that among former chiefs it was the center of contention over certain fishing rights. It was visited in 1819 by Peter Corney, who gives the following information:

“Mr. Manning [Manini] had an island in Pearl River…it is about two miles in circumference, having a large cave in the center…Only one family resides there….One evening after supper the man gave us an account of a singular affair, which occurred to him when he first got charge of the island. He was one night awakened by some person calling him by name, and telling him to attend to what he said; he looked up and was much terrified on beholding the pale form of the late King Pereoranee [Peleioholani] before him, who told him as he valued his life so must he perform what he enjoined; which was to go to the cave, where he would find his bones with the bones of several great chiefs; he was to take them from thence and convey them to a place of safety, out of the reach of a chief Tereacoo [Kaleioku], who would come the next day with a party to search the island for the bones of the king and chiefs, to make points for their arrows to shoot rats with…

“The next day, according to the prediction, the chief came and searched the island; the man told him that as the island and all that was on it belonged to a white man of whom Tameameah [Kamehameha] was very fond, he ought not to come there to search for bones, when there were too many on the main island. The chief took no notice, but searched and took several bundles of bones with him, though not those of the king and chiefs. Tereacoo departed, and on the ensuing night the deceased king and many chiefs appeared to the man, and thanked him for what he had done, assuring him that the white men would protect him and that he should one day become a great man…The next morning I went round the island, which seems as though it had been kept for a burial place, for I saw hundreds of bundles of human bones, wrapped carefully in cloth, and laid in the crevices of the rocks.” (McAllister 1933:102)

Moku‘ume‘ume Island (Ford Island) lies in Pearl Harbor approximately 1.1 miles (1.8 kilometers) west of the nearest point of the HHCTCP Airport (Phase 3) project area.

The nearest of these sites to the current project area is Makalapa Crater at a distance of 300 m west and again McAllister did not believe that pond was of any great antiquity.

4.1.2 Other Archaeological Studies at Hālawa

Table 6 lists the relatively few archaeological studies of Hālawa Ahupua‘a other than at Hickam Air Force Base or for the work on the H-3 project.

Table 6. Archaeological Studies of Hālawa (for Hickam studies see Table 8)

Source	Type of Investigation	General Location	Findings
Cluff 1970	Archaeological Survey	Hālawa Interchange with H-1 Freeway	Survey focused around vicinity of Saratoga Drive. Surface survey identified: 1 possible heiau, 1 historic house platform, a stone wall, and several burial structures (2 family plots, 3 mounds, 1 concrete enclosure). Subsurface excavations of the possible heiau structure were inconclusive
Ayres 1971	Archaeological Survey and Excavations	South Hālawa Valley	Identified 48 sites: 16 agricultural terraces, 7 house platforms, 2 walled house structures, 4 caves, 2 agricultural clearings, 3 walls, 3 mounds, 1 c-shape, 9 historic sites & 1 stream diversion
Barrera 1971	Archaeological Site Survey	Proposed Honolulu Stadium	No finds but notes accounts of unmarked graves along Saratoga Drive
Denison and Foreman 1971	Archaeological Investigations	South Hālawa Valley	Includes site descriptions of 20 sites noted by Ayres (1971):7 platforms, 6 terraces or terrace systems, 2 mounds, 2 walled house sites, and 3 caves
Crozier, 1972	A Preliminary Report on the Phase II, Part 2 Survey of	H-3 Highway Corridor in the South Hālawa Valley	Restoration work at two *heiau* and excavations at a residential & agricultural site and a large residential enclosure
Barrera 1979	Archaeological reconnaissance	HECO 138 KV transmission line from Hālawa sub-station to the Pūkele sub-station in Pālolo	Mention six sites which were located by Ayers

Source	Type of Investigation	General Location	Findings
Avery, Brennan, Denham, Kennedy and Ward 1994	Paleoenvironmental Reconstruction Monitoring Report	Adjacent to the mouth of Hālawa Stream & Waiau-Makalapa No. 2 138 KV Overhead Lines (Phase II) corridor along Kamehameha Highway	No cultural materials were observed but the results of pollen analysis are presented.
Hammatt, and Winieski 1994	Archaeological Reconnaissance Survey	Proposed Hālawa Well immediately SE of stadium	No significant finds, notes major impact of commercial sugar cultivation
Anderson 1995	Archaeological Monitoring	Kuahua Peninsula, Naval Submarine Base	Identified fishpond deposits associated with Wailolowai Fishpond (50-80-13-100)
Bishop Museum 1997	Archaeological Inventory Survey	H-3 corridor North Hālawa	Discusses 70 archaeological sites
Dye 1999	Archaeological Resources Survey	Kamehameha Highway Hālawa Bridge	No significant finds, major 20th century landscape modifications to vicinity noted
Williams, and Dye, N. D.	Study of archaeological models and applied Bayesian analysis (draft)	Loko Kunana fishpond at margin of Pearl Harbor	Study of modeling of dates from a core of fishpond
McGuire, Shideler and Hammatt 1999	Archaeological Assessment	Queen Emma Foundation approx. 1,728 acre parcel, South Hālawa Valley	Re-examined certain previously identified sites and newly reports 6 sites incl. -5737 a burial cave, -5738 a terrace complex, -5739 a C-shape enclosure, -5740 a rectangular enclosure, -5741 a habitation & agricultural site complex, and -5742 a round enclosure

Source	Type of Investigation	General Location	Findings
Athens 2002	Paleoenvironmental Investigations	U.S. Navy's Pearl Harbor Shipyard	Investigations of an unnamed fishpond consisting of 2 cores and 2 trenches. Core samples identified natural wetland and fishpond sediment, with transition date estimated at A.D. 1299-1407

In 1970, Deborah Cluff of the DLNR conducted an archaeological survey of the proposed Hālawa Interchange with the H-1 Freeway. The impetus for the archaeological survey arose from concerns of the community who described numerous graves within the area, including family graves. As the majority of the project area encompassed previous canefield lands, the survey concentrated along the immediate vicinity of Saratoga Drive. Eight sites were identified, including historic grave structures and one stone house platform. Residents of the area also noted that a heiau was known to have been in the vicinity. Cluff identified a possible heiau structure and conducted subsurface excavations, however the function of the structure remained indeterminate.

In 1970, William Ayres did an archaeological survey and excavations in Kamana-nui valley, Moanalua and South Hālawa valley. The South Hālawa portion of the project area consisted of a 500 ft. wide strip along the valley bottom, beginning approximately 550 meters (1800 ft.) WSW of Hālawa jail and running ENE 2.25 kilometers (1.4 miles), to end 122 meters (400 ft.) S of the Hawaiian Electric Company substation. Forty-eight sites were recorded within the survey area: 16 agricultural terraces, 7 house platforms, 2 walled house structures, 4 caves, 2 small agricultural clearings, 3 walls, 3 mounds, 1 c-shaped structure; 9 historic sites (i.e., paved road with stone curbing, animals pens, a well) and 1 stream diversion feature. Limited test excavations were done due to the unexpected number of sites found and time constraints. From one of the sites, Site 50-Oa-B1-51 (State Site #50-80-674), Test Pit No. 1, volcanic glass samples were submitted for hydration rind dating. Test results showed three dates ranging from 1542±65 to 1561±133 (Ayres 1970:67), suggesting the major period of use as the 16th century, although the validity of hydration rind dates is a matter of some dispute.

In October, 1971 David Denison and Arthur Foreman conducted a Phase II archaeological investigation based on Ayres' recommendations. Of the 48 sites Ayres located, 20 were recommended for mapping and excavation. Sixteen of the 48 sites were noted to be concentrated in a small area bounded by Hālawa Stream and a major side stream

William Barrera (1979) conducted an archaeological reconnaissance for Chiniago Inc. related to Hawaiian Electric Company's (HECO) 138 KV transmission line from Hālawa sub-station to the Pūkele sub-station in Pālolo. The project area went through HECO's right-of-way through Hālawa and was limited to areas of most probable usage. Due to the nature of the reconnaissance, Barrerra does not give descriptions of the sites he located as these were previously documented in Ayers 1970 report published by Bernice P. Bishop Museum. Barrerra does mention six sites which were located by Ayers. The sites consisted of walls, an agricultural

terrace, a possible house platform, a clearing or probable garden plot and a mound or possible grave. (Barrera 1979:A1-A2)

Williams and Dye (draft, no date) report on archaeological modeling and Bayesian analysis of a sediment core from the Loko Kunana fishpond.

In 1995, Lisa Anderson of Ogden Environmental and Energy Services Company, Inc. conducted monitoring of a sewer installation project (MILCON P-115) within Kuahua Peninsula, Naval Submarine Base. Fishpond deposits associated with Wailolowai Fishpond (SIHP #50-80-13-100) were identified.

Avery, Brennan, Denham, Kennedy and Ward (1994) reported on a paleoenvironmental reconstruction adjacent to the mouth of Hālawa Stream in a Monitoring Report of the Waiau-Makalapa No. 2 138 KV Overhead Lines (Phase II) project that ran along Kamehameha Highway from Aloha Stadium to Makalapa 1.3 kilometers west of the current project area.

Hammatt and Winieski (1994) carried out a reconnaissance survey for a proposed Hālawa Well just southeast of the Aloha Stadium but identified no sites noting that all evidence of earlier activity was probably eradicated by commercial sugarcane cultivation.

McGuire, Shideler and Hammatt (1999) conducted an archaeological reconnaissance and assessment of a portion of South Hālawa Valley. The purpose of this reconnaissance and assessment was to address concerns associated with the probable increased public access to these lands following the opening of the H-3 access road to the public and possible recreational educational use (i.e., guided hikes, educational walks) of these lands by the Queen Emma Foundation. The McGuire et al. (1999) project area consisted of approximately 1728 acres including the main drainage of South Hālawa Stream and a major tributary gulch to the north of South Hālawa Stream. Particular attention was given to the relatively flat bottom lands of South Hālawa Stream and the less steep portions of the major tributaries of South Hālawa Stream which were understood as the areas most likely to be impacted by the proposed activities of the Queen Emma Foundation. The cliff face on the west side of the valley, which was known to contain burial caves, was also explored for the possibility of both previously reported and unreported burial caves. Selected sites within the project area, which had previously been identified in earlier surveys, were re-identified to check on the current condition and status of these sites. As the nature of the project was reconnaissance and assessment, sites were identified, photographed and mapped. No testing, excavation or data recovery was performed. Six sites were newly identified including -5737 a burial cave, -5738 a terrace complex, -5739 a C-shape enclosure, -5740 a rectangular enclosure, -5741 a habitation & agricultural site complex, and -5742 a round enclosure.

4.2 H-3 Archaeological Studies in Hālawa Valley

In many ways the most analogous archaeological project to the present HHCTCP was the B. P. Bishop Museum’s H-3 work that included extensive studies of North Hālawa Valley (and some preliminary study of South Hālawa Valley) (Table 7).

In 1976 an archaeological reconnaissance survey was conducted by Neal Oshima. The survey identified seven sites within the proposed path of the H-3 freeway. A Phase I survey of these

seven sites was recommended. The report concluded that North Hālawa valley was used primarily for agriculture during the pre-Contact and early post-Contact time periods.

In 1976 Aki Sinoto conducted an archaeological reconnaissance survey through a portion of South Hālawa valley for Parsons Brinckerhoff-Hirota Associates. At the time, portions of South Hālawa were being considered as an alternate route for the H-3 freeway. Prior to this, all previous archaeological studies had been contained to the lower valley portions ending at the Hawaiian Electric Company sub-station. The Sinoto survey area was a 3-mile portion of the valley which started at the aforementioned sub-station and ended at about the 2000 ft. elevation near the valley head. Findings concluded that the majority of the sites occurred along the valley floor and the flood plain area and bordered the stream. Both pre-historic and historic sites were identified during this survey. The prehistoric sites consisted of a wall, a house platform, three circular walled enclosures, and agricultural terraces. The historic sites included a charcoal oven and earthen terraces. (Sinoto 1976:2-4) As this project was only a reconnaissance survey, sites were merely identified and no further work was done. Recommendations were made for a Phase I intensive survey including instrument location and plotting of all sites and features; detailed site descriptions including mapping, profiles and photographs; surface collection of cultural materials (i.e., midden, soil samples, artifacts); and selective test excavation. Sinoto concluded that the individual sites were not unique in and of themselves, but maintained that when viewed as a whole agricultural complex, the sites do have research potential. (Sinoto 1976:4)

As a result of Oshima’s initial survey, Thomas Dye (1977) did a Phase I survey of the above mentioned sites. The survey area included the floor and lower slopes of North Hālawa Valley from the Board of Water Supply pumping station to the back of the valley at the base of the Ko‘olau range. No pre-contact surface features were found and all sites were determined to be post-contact. Four caves were explored in the NW wall of the lower valley. Midden and historic refuse were found in only one cave. No caves were located in the SE wall of the valley. The estimated dates for the beginning of dry land agriculture in Site B1-75 was given as 1347+/-15 A.D. based on volcanic glass hydration rind dating (such dates have since been questioned). The report concluded that there were no pre-contact surface features found. All sites found were relatively late and no further archaeological work was recommended. In fact, however, over ten million dollars would be spent on the archaeology of North Hālawa Valley over the next twenty years.

Paul Chistiaan Klieger prepared his (1995) *Nā Maka o Hālawa*: A History of Hālawa Ahupua‘a study as a historical background for the B. P. Bishop museum’s H-3 archaeological work in North Hālawa valley.

The B. P. Bishop Museum produced their “*Imu, Adzes, and Upland Agriculture*” archaeological inventory survey report in 1997 describing 70 archaeological sites along the H-3 North Hālawa corridor. The sites were widely distributed in the lower, middle and upper valley.

Table 7 H-3 Related Studies in Hālawa Ahupua‘a

Source	Type of Investigation	General Location	Findings
Oshima 1976	Archaeological Reconnaissance Survey	Portions of North Hālawa Valley	Identified seven sites within the proposed path of the H-3 freeway
Sinoto 1976	Archaeological Reconnaissance Survey	3 mile portion of east section of (South) Hālawa Valley	Identified pre-contact (a wall, a house platform, three circular walled enclosures, and agricultural terraces) and post-contact sites (a charcoal oven and earthen terraces)
Dye 1977	Phase I survey of Oshima 1976 sites	Floor and lower slopes of North Hālawa Valley from the Board of Water Supply pumping station to the back of the valley	No pre-contact surface features found. All sites found were relatively late and no further archaeological work was recommended.
Klieger 1995	A History of Hālawa Ahupua‘a	Hālawa Ahupua‘a	A historical study prepared in Association with the Bishop Museum’s H-3 work
Bishop Museum 1992	Preliminary Summary of Sites	North Hālawa Valley Sites 50-80-10-2137 and 50-80-10-2010	Discussion of two sites interpreted by some as a *heiau luakini* and a *Hale o Papa*

4.3 Hickam Air Force Base Archaeological Studies (Hālawa and Moanalua Ahupua‘a)

The former Hickam Air Force Base (now part of Joint Base Pearl Harbor – Hickam; JBPHH) lies adjacent to the southwest of the HHCTCP corridor. The former Hickam Air Force Base straddles the *ahupua‘a* of Hālawa (‘Ewa District) and Moanalua (Kona District) and has been the subject of over 85 archaeological studies. Particular concern was generated for the greater Hickam area by the discovery of at least 87 burials at Fort Kamehameha. It now appears that the area of burials was fairly localized and far from the HHCTCP corridor. A particularly important, relatively early study was the Anderson and Bouthillier (1996) work which attempted a synthesis of historical and archaeological documentation and produced an archaeological/ historical resources sensitivity map for the base.

Analysis of the results of some 54 archaeological studies that have taken place at Hickam AFB since Anderson and Bouthillier (1996) produced their sensitivity map suggests that the designation of a large inland portion of Hickam AFB as of high and moderate archaeological sensitivity may not be the case (Figure 24). We now know a great deal more about the likelihood of significant subsurface deposits in inland Hickam, which appears to be not high or even moderate but, as a generalization, may be expected to be rather low. Below, is a summary table of Hickam Air Force Base archaeological studies, and Figure 25 depicts the location of several of these studies.

Table 8. Previous Archaeological Studies at Hickam Air Force Base and Fort Kamehameha Arranged Chronologically (seaward portions of Hālawa and Moanalua Ahupua‘a; presentation builds on work of Anderson and Bouthillier 1996 and Jourdane and Dye 2006)

Source	Type of Investigation	General Location	Findings
Cobb 1905	Fisheries Inventory	Territory-wide	Fishponds in Hālawa were noted to include: Kunana (25 acres, partly filled), Pōhaku (2.5 acres, partly filled), Waiaho (32 acres), Name not known (5 acres, partly filled); Fishponds in Moanalua include: Lelepaua (332 acres, mostly filled up), Kaihikapu (258 acres)
Stokes 1909	Study of walled fish traps	Pearl Harbor	Located former fish trap at Bishop Point
McAllister 1933	Early survey	O‘ahu Island	Site 81. Kaihikapu Fishpond, Site 82. Lelepaua a large inland fishpond at Moanalua, Site 94. Loko Waiaho, known as Queen Emma’s pond, Site 95. Loko Ke‘oki was a pond near Watertown, Site 96. Papiolua Fishpond in Hālawa
Jordon, 1980	The Land on Which Hickam Was Built (manuscript)	Hickam AFB	Historical Survey

Source	Type of Investigation	General Location	Findings
Hammatt et al. 1986	Archaeological subsurface testing	Proposed water main replacement, Fort Kamehameha	Gleyed soils interpreted as fishpond sediments dating to A.D. 1340-1650. Cultural materials included a possible pearl shell fishhook, 3 polished basalt beads or sinkers, and various historic artifacts
Watanabe 1986	Archaeological site survey and subsurface testing	FY 87 Sell/Replace Program, Fort Kamehameha	Located concrete foundations, walkways, roadway, ammunition storage bunkers, air raid shelter and dump piles. Testing identified sediments from embayed ponds and marsh environment
Hammatt and Borthwick 1987a	Archaeological subsurface testing	Proposed power check pad with noise suppressor, Fort Kamehameha	No significant finds
Hammatt and Borthwick 1987b	Archaeological subsurface testing	Proposed F-15 flight simulator	No significant finds
Hammatt and Borthwick 1987c	Archaeological subsurface testing	Proposed apron addition	Only historic materials dating to the 1920s and 1930s
Hammatt and Borthwick 1987d	Archaeological subsurface testing	Proposed Avionics/weapons release facility and new by-pass road	Fishpond sediments, no cultural materials
Streck and Watanabe 1988	Excavation for recovery of human remains	Quarters # 14, Fort Kamehameha	Excavation of 1 adult and 3 juveniles
Hammatt et al. 1988	Archaeological monitoring report	Water main replacement, Fort Kamehameha	Gleyed soils interpreted as fishpond sediments dating to A D 1385-1655

Source	Type of Investigation	General Location	Findings
Shun and Schilz 1991	Subsurface archaeological survey	Wastewater treatment plant, Fort Kamehameha	Single adult human burial, an adze preform and a polished adze. Documented pond sediments
Watanabe 1991	Archaeological site survey and subsurface testing	MIDPACK T-1 Network project, Fort Kamehameha	No significant finds
Drolet 1992 (1996)	Phase I Archaeological subsurface testing and data recovery	Wastewater treatment plant, Fort Kamehameha	Component I single human burial, 7 pit features & cultural materials dating to AD 1200 to 1550 Component II Nine human burials dating to AD 1450-1900 Component III post 1900 historic materials
Kennedy and Denham 1992	Archaeological monitoring report	MIDPACK T-1 Network project, Fort Kamehameha	No significant finds
Drolet 1993 (1999a)	Phase II Archaeological subsurface testing and data recovery	Wastewater treatment plant, Fort Kamehameha	SIHP # 50-80-13-4499 assigned. Component II Seventeen human burials & 2 animal burials Component IIIa 19th cent glass and ceramic wares Component IIIb post 1900 historic materials
Denham and Cleghorn 1994	Report of Archaeological Inventory Survey and Limited Subsurface Testing	Proposed Family Housing Revitalization Projects, Work Areas B and C, Hickam AFB	Minimal finds (mid-20th century features assoc. with military housing)
Lawrence, and Spear 1995	Archaeological Monitoring and Sampling Report	Underground Storage Tanks at Hickam AFB	Minimal finds
Eulberg 1995	Inadvertent Discovery	Battery Hasbrouck	Inadvertent discovery of human left hip bone within Battery sand berm

Source	Type of Investigation	General Location	Findings
Sprinkle, 1996	Cultural Resource Investigation	Proposed Detention Facility	Not found in SHPD library
Athens, Ward and Tomonari-Tuggle 1997	Paleoenvironmental Coring	Loko Ka‘ihikapu, TRACON Expansion, Hickam AFB	Inconclusive data regarding presence of prehistoric fishpond sediments
Drolet 1997 (1999b)	Phase III Archaeological Monitoring and Data Recovery	Wastewater treatment plant, Fort Kamehameha	Component I double midden pit Component II Thirteen human burials within ten graves & 2 animal burials Component IV historic trash pits
Athens, and Magnuson 1998	Archaeological Subsurface Survey	Low Level Windshear Alert System, Station No. 1 Relocation, Hickam AFB	No cultural finds. Pollen analysis results presented.
Anderson and Bouthillier 1998	Assessment & analysis of historic properties	Hickam AFB	Preparation of a historic preservation plan providing a synthesis of prior studies
Tomonari-Tuggle, 1998	Archival Background Research	Honolulu Airport Post Office	Not found in SHPD library
Athens, and Ward 1999a	Paleoenvironmental Coring Report	Ka‘ihikapu Fishpond, Vault-X Project, Honolulu International Airport	Site 50-80-13-81 fishpond research – no sediments from pre-Contact Polynesian period
Athens, and Ward 1999b	Paleoenvironmental Coring Report	Loko Lelepaua, Hickam AFB	Not found in SHPD library

Source	Type of Investigation	General Location	Findings
Carlson, 1999	Archaeological Monitoring Report	For Installation Restoration Program Activities at Hickam AFB	No significant finds. Possible fishpond sediments discussed.
Drolet 1999a	Phase II Archaeological Subsurface Testing and Data Recovery Report	Wastewater Treatment Plant at Fort Kamehameha	Not found in SHPD library
Drolet 1999b	Phase III Archaeological Monitoring and Data Recovery Report	Wastewater Treatment Plant, Fort Kamehameha	Not found in SHPD library
Robins, Clark, and Allen, 1999	Monitoring and Sampling During Construction Excavations Report	AMC Ramp Lighting Project at Hickam AFB	Dates Lelepaua Fishpond (SIHP # 50-80-13-82) to late 13th to mid-15th centuries
Wolforth and Rechtman 1999	Archaeological Monitoring	Wastewater Treatment Plant, Fort Kamehameha	No significant finds
Erkelens, 2000	Archaeological Monitoring Report	For Underground Storage Tank Removals, Hickam AFB and Pearl City Peninsula	No significant finds
The Environmental Company, Inc. 2000	Addendum Archaeological Monitoring	For Petroleum, Oils & Lubricants (POL) System Component Removal, Fort Kamehameha	Identified probable fishpond sediments associated with Lelepaua Fishpond

Source	Type of Investigation	General Location	Findings
Magnuson, 2000	Archaeological Monitoring Report	Storage Tank Removal Hickam AFB	One focus of work was noted to be at Lelepaua Pond.
Athens, Ward and Blinn 2001	Paleoenvironmental Coring Report	Tank 2, Hickam AFB	Investigations of Lelepaua Fishpond found no intact evidence for fishpond sediments at this location
Buffum, and Davis 2001	Archaeological Monitoring Report	Construction Related to Replacement of Building 2172 at Hickam AFB	No significant finds
Carlson, 2001	Archaeological Monitoring	Dredging Activities of the Manuwai Canal, Hickam AFB	No significant finds
Curtis, 2001a	Report on Emergency Replacement of Two Utility Poles	Hickam Air Force Base	Possible fishpond remnants noted
Curtis, 2001b	In House field Check Report	For Photovoltaic Light Installation, Hickam AFB	No significant finds
Dega, Davis, Ward and Winsborough 2001	Archaeological Monitoring and Sampling Report	In Conjunction with Subsurface Plume Investigations at Hickam AFB	Investigations at Ka‘ihikapu fishpond but concluded there was substantial sediment mixing
Dega and Davis 2001	Archaeological Monitoring Report	Base Civil Engineer Maintenance Complex, Fort Kamehameha	Identified 1 historic pit feature containing fuel drum

Source	Type of Investigation	General Location	Findings
Desilets, and Magnuson 2001	Archaeological Monitoring Report	During Additional Underground Storage Tank Removal, Hickam AFB	Not found in SHPD library
Drolet 2001	Phase IV Archaeological Monitoring, Testing and Data Recovery Report	Wastewater Treatment Plant, Fort Kamehameha	Not found in SHPD library
Magnuson, 2001	Archaeological Monitoring Report,	Engineering Evaluation/Cost Analysis project for Sites Along Runway 8L, Hickam AFB	No significant finds
Roberts, 2001	Archaeological Monitoring	Grease Pit Excavations at Building 1654 Hickam AFB	No significant finds
Desilets, 2002a	Archaeological Monitoring Report	Hazardous Waste Removal at Māmala Bay Golf Course & Landfill Site LF05, Hickam AFB	No significant finds
Desilets, 2002b	Archaeological Monitoring Report	For DO-58 Underground Storage Tank Verification and Removal, Hickam AFB	Not found in SHPD library

Source	Type of Investigation	General Location	Findings
Desilets, 2002c	Archaeological Monitoring Report	For DO-81 Underground Storage Tank Verification and Removal, Hickam AFB	Steel fuel tank assoc. with Coastal Battery Selfridge (SIHP 50-80-13-1600) was noted
Grant, 2002	Archaeological Monitoring Report	For Upgrade Hanger Complex (KNMD 983001) Hickam AFB	No significant finds
McGhee, and Curtis, 2002a	Archaeological Monitoring and Sampling Report	Carried out in conjunction with Transformer Replacement Projects Fort Kamehameha Historic District	Minimal finds (historic artifacts)
McGhee, and Curtis, 2002b	Archaeological Monitoring Report	Carried out in Conjunction with Repair and Upgrade of Sewer lines Projects Hickam Air Force Base	No significant finds
McGhee, and Curtis, 2002c	Archaeological Monitoring Report	Carried out for Soil sampling in Conjunction with Military Housing Replacement Hickam AFB	No significant finds

Source	Type of Investigation	General Location	Findings
Roberts, 2002	Archaeological Monitoring Report	For Utility Upgrade Excavations, Signer Boulevard, Hickam AFB	No significant finds
Magnuson 2002	Archaeological Monitoring Report	AMC Stripper Pit Remediation, Hickam AFB	Not found in SHPD library. CH2M Hill letter references no finds.
Roberts, and Bower 2002a	Archaeological Monitoring Report	For a Helipad Fence Hickam AFB	No significant finds
Roberts, and Bower 2002b	Archaeological Monitoring Report	For Fire Rescue Training Facility Project, Hickam	No significant finds
Roberts, Dang and West, 2002	Archaeological Monitoring Report	For Hickam Alert Aircraft Terminal (HAAT) Security System Installation Project, Hickam AFB	No significant finds
Roberts and West 2002	Archaeological Monitoring Report	Carried out for the Installation of KNMD 97-4011, M/R Waterline and Hydrants, MFH Hickam Air Force Base	No significant finds
Roberts and West 2002	Archaeological Monitoring Report	For Combat Installation Transportation System (CITS), Hickam AFB	No significant finds

Source	Type of Investigation	General Location	Findings
Roberts 2002	Archaeological Preconstruction Investigation	Storm Drain Repair/Upgrade Fort Kamehameha	No significant finds
Borthwick, Bush, and Hammatt 2003	Monitoring Report for Geotechnical Sampling	HIANG Project No. KNBD 989064A Clear Water Rinse Facility, Hickam AFB	No significant finds
Desilets, 2003	Archaeological Monitoring Report	For DO-81 Underground Storage Tank Verification and Removal, Hickam AFB	Monitored 38 UST sites. Data indicated this area was once a wetland marsh environment. One site (-3440) documented: an early 1900s steel fuel tank associated with Coastal Battery Selfridge (-1600)
Magnuson, 2003	Archaeological Monitoring Report	For Replacement of POL Pipelines and Fuel Additive Injector, Hickam AFB	No significant finds
McElroy, 2003	Archaeological Monitoring report	For a Communication Line Installation at Hickam AFB	Minimal finds (late 1800s & early 1900s Watertown artifacts
McGhee, and Curtis, 2003a	Archaeological Monitoring Report	Backyard Fence Installation Behind Building 3327 Hickam AFB	No significant finds
McGhee, and Curtis, 2003b	Archaeological Monitoring Report	Fence and Gate Installation Near Building 3004 Hickam AFB	No significant finds

Source	Type of Investigation	General Location	Findings
Ogg, Dega, Ward, and Winsborough 2003	Archaeological Monitoring and Sampling Report	Carried out at an Abandoned Fire Training Area at Hickam AFB	No significant finds
Davis and O’Rourke 2004	Archaeological Investigations Report	For Construction of New Facilities on Airport Apron at Hickam AFB	Identified a cultural layer (SIHP 50-80-13-6692) containing numerous post hole and pit features
Pantaleo 2004	Archaeological Monitoring Report	For the Hickam AFB Chain Link Fence	No significant finds
Dye, 2004	Archaeological Survey Report	Proposed Visitor’s Quarters, Hickam AFB	No significant finds (1930s Hickam artifacts)
DeBaker and Roberts 2004	Archaeological Monitoring Report	Waterline Construction, Fort Kamehameha	No significant finds
DeBaker, and Peterson 2005	Archaeological Monitoring and Data Recovery Report	Carried out for the Airport Apron Wash Rack Renovation Project Hickam AFB, Oahu Island, Hawaii (TMK: 9-9-01:13, 14)	Comments on previously identified site 50-80-123-6692 reported in Davis & O’Rourke 2004) but there were no new finds
DeBaker and Brown 2005	Archaeological Inventory Survey	Waterline Replacement at Fort Kamehameha	No significant finds

Source	Type of Investigation	General Location	Findings
DeBaker, Peterson and Roberts 2005	Archaeological Monitoring and Sampling	Carried out for Waterline Replacement Project Bishop point and Fort Kamehameha Hickam AFB (TMK: 9-9-01:13, 14)	Minimal finds (20th century artifacts associated with Watertown Village
Grant 2005	Archaeological Monitoring Report	For Fire System Sprinkler Installation at Building 1073 Hickam AFB	Disturbed or redeposited cultural material (midden, organic rich lenses) observed
Jourdane, and. Dye 2005	Archaeological Monitoring	Results of Monitoring of Alternate Circuits at Hickam AFB	No significant finds
Putzi, and Dye 2005a	Archaeological Monitoring Report	for Phase II Housing Development at Hickam Air Force Base	Describes SIHP # 50-80-13-6761 a retaining wall related to Water Town 1908-1935
Putzi, and Dye 2005b	Archaeological Monitoring Report	Report for Replace Military Family Housing Projects at Hickam AFB	Describes a T-shaped trestle but no other historic sites
Putzi, and Dye 2005c	Archaeological Monitoring Report	Conducted for the Installation of Sec Light at Hickam AFB	No significant finds

Source	Type of Investigation	General Location	Findings
Shun, and Shaw 2005	Archaeological monitoring	Carried out for Upgrade Electrical Distribution System Phase I, TMK [1] 9-9-001:013 Hickam AFB	No significant finds
Tome, and Spear 2005	Archaeological Monitoring Report	Communications Utilities Related to the Ship Operations Building, Pearl Harbor	Identified 2 subsurface features consisting of early to mid 20th century artifacts associated with early history of Wartertown and Hickam AFB. Traditional artifacts out of context were recovered
Jourdane, and Dye 2006	Archaeological Monitoring Report	Underground Storage Tank Verification and Removal, Hickam AFB, Site Investigation Areas F3018, F2004, F701, and 3222	Monitoring at 13 locales identified no traditional Hawaiian cultural materials or significant finds
Jourdane and Dye 2006	Archaeological Monitoring Report	Underground Storage Tank Verification and Removal, Hickam AFB, Site Investigation Areas F531, F536, F529-1, -2, -4, -5, -6, -7, -8	Monitoring at 9 locales. No significant finds
McElroy, Dye and Jourdane 2006	Archaeological Monitoring and Investigation	Installation of Leach Field at Hickam AFB	Deposits associated with fish ponds

Source	Type of Investigation	General Location	Findings
Petrey and McDermott 2008	Archaeological Monitoring Report	Māmala Substation	No significant finds
Carson, Naboa and Athens 2009	Archaeological Monitoring Report	For Wharf A-7 Repair at Bishop Point	No significant finds

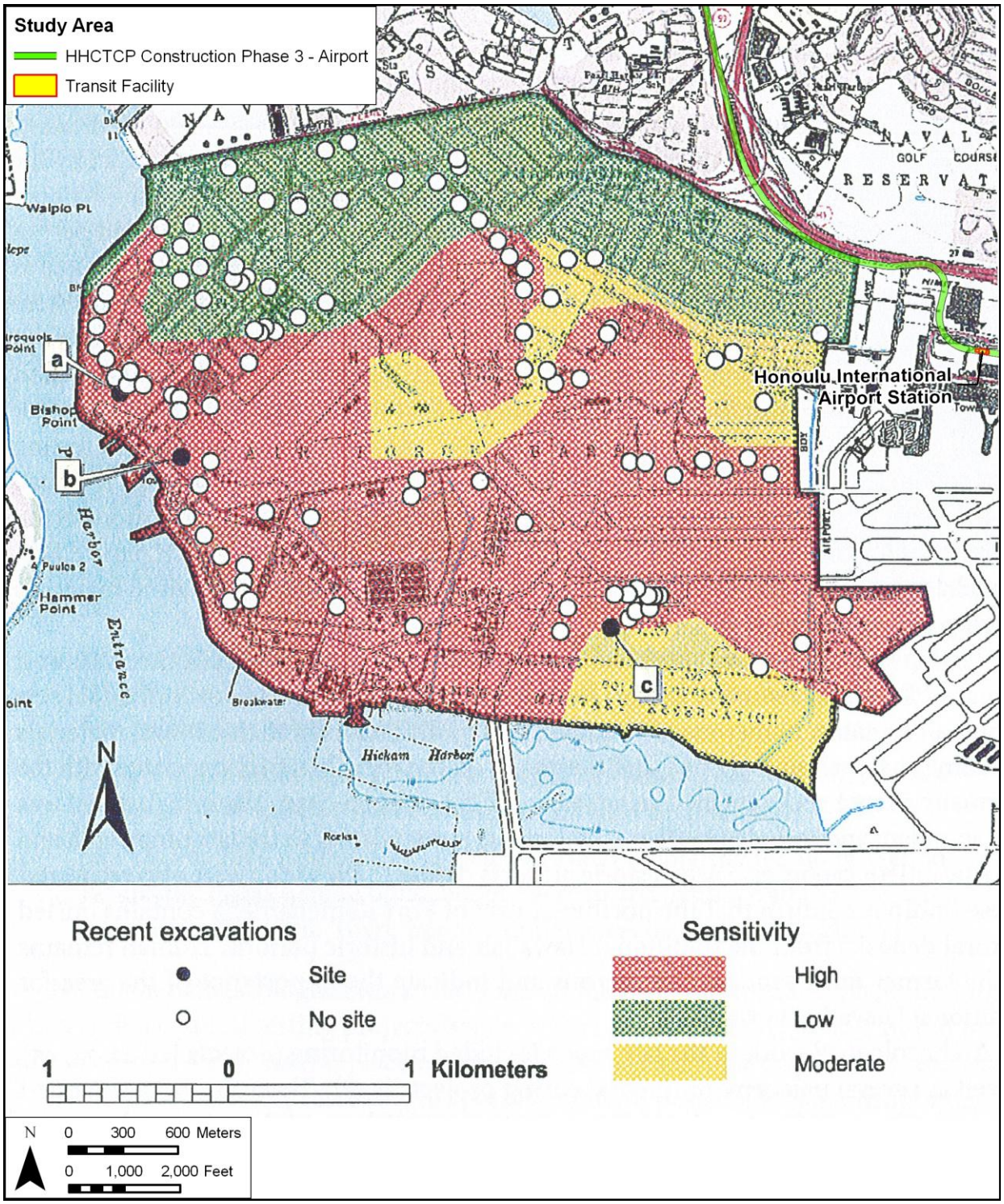

Figure 24. Results of recent archaeological investigations at Hickam AFB (adapted from Jourdane and Dye 2006:18, showing that in over 100 recent excavations including over 50 in the Anderson and Bouthillier “High Sensitivity” zone there have only been three areas identified as archaeological sites

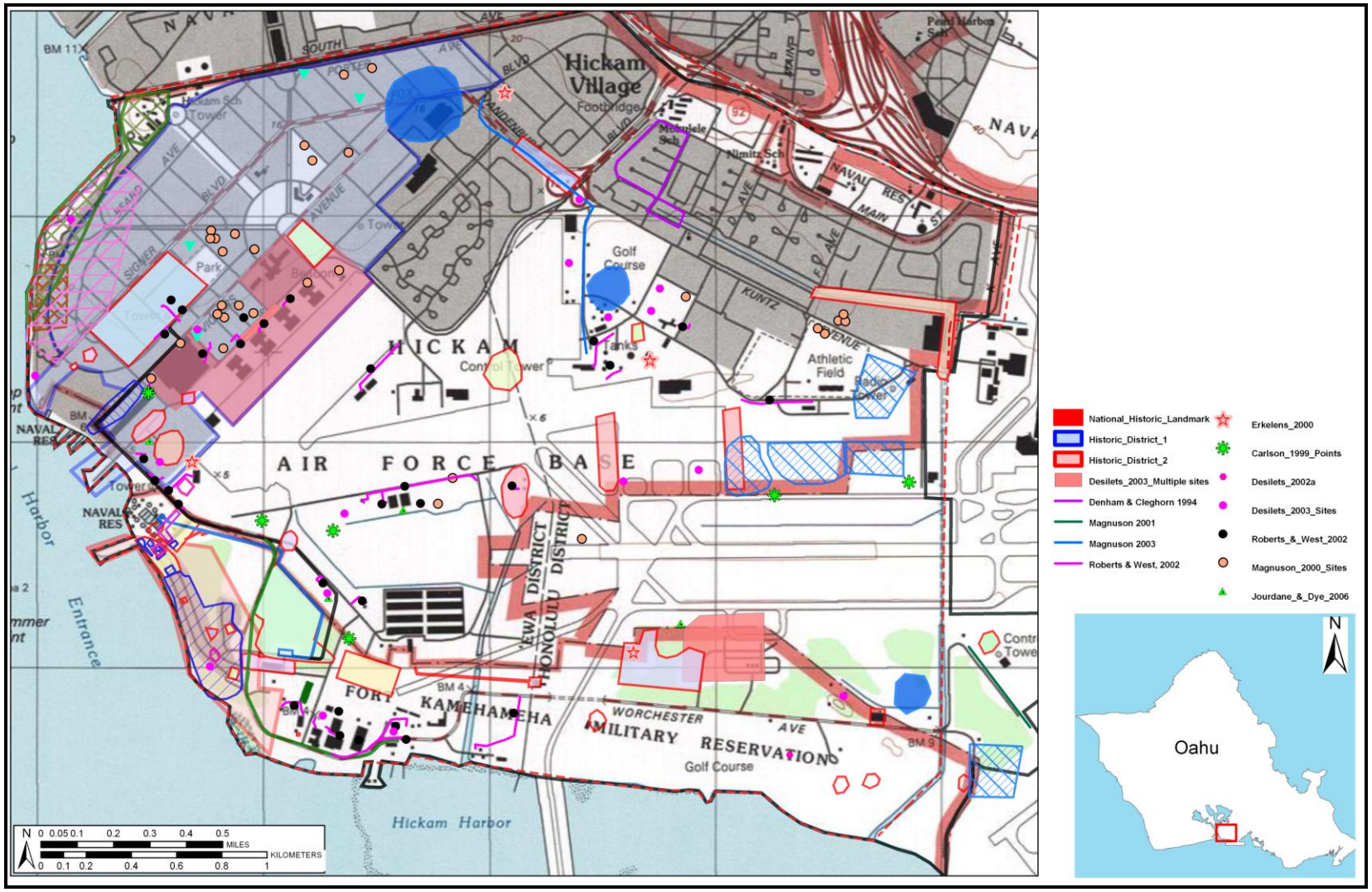

Figure 25. Previous archaeological studies at Hickam Air Force Base (coastal Hālawa and Moanalua Ahupua‘a)

4.4 Moanalua Previous Archaeological Research

Historic properties were first documented in Moanalua Ahupua‘a during the pioneering attempt at a comprehensive archaeological survey on the island of O‘ahu by J. Gilbert McAllister of the Bishop Museum in 1930. (Significantly, McAllister relied on - and transcribed - information from the same Namakahelu who told the Moanalua traditions to Gertrude MacKinnon Damon). McAllister recorded 19 “sites” (designated consecutively from Site 76 to Site 93 but including a Site 77-A) within the *ahupua‘a*, giving their approximate locations (Figure 26) and describing their conditions at the time of the survey. The properties include several features noted in the previous section of this report but are reported as follows (quotations within McAllister’s account are further indented):

> Site 76. Oven (*imu*), Moanalua Gardens (McAllister 1933:91-92) [McAllister places this approximately 900 m *mauka* of the Transit alignment, see Figure 26].
>
> A story is told by Namakahelu relating to an old *imu* which was once in the Moanalua gardens at the present site of the Damon "Chinese house":
>
>> When Kamahalolanialii was the chief of Moanalua, there lived in his district a very handsome youth called Keliikanakaole. Because of his graceful and stately bearing and his fine physique, the women were very fond of him and coveted his favors. This made Kamahalolanialii exceedingly jealous and, as time went on and the youth became more popular, the chief determined to rid himself of a mere commoner who excelled him in so many qualities and even dimmed his prestige among the ladies. For months Kamahalolanialii had the youth closely watched to discover some misdemeanor however slight, as an excuse for putting him to death. But the youth's conduct was impeccable. In exasperation •. Kamahalolanialii determined upon some other action. deciding upon some trial at which Keliikanakaole would be certain to fail. He went to Paeli, a man of superior. mental ability who lived up in the mountains of Moanalua Valley, and asked for a riddle which would be very difficult to answer. He did not tell him for what purpose he would use this conundrum. Shortly after, Kamahalolanialii called a gathering of men to which Keliikanakaole was invited. His purpose, of course, was to present his riddle, which he ostensibly wanted everyone to try, offering a reward to any man who could find the answer within a certain number of months. He commanded of Keliikanakaole that he discover the answer, or forfeit his life, which would be taken by roasting in a red-hot *imu.* If he did learn the answer, then the chief would forfeit his own life. He then began to recite the riddle:
>
>> | | |
>> |---|---|
>> | *Ku au ekahi helu ana oukou* | First month you count one |
>> | *Ku au elua helu ana oukou* | Second month you count two |
>> | *Ku au ekolu helu ana oukou* | Third month you count three |

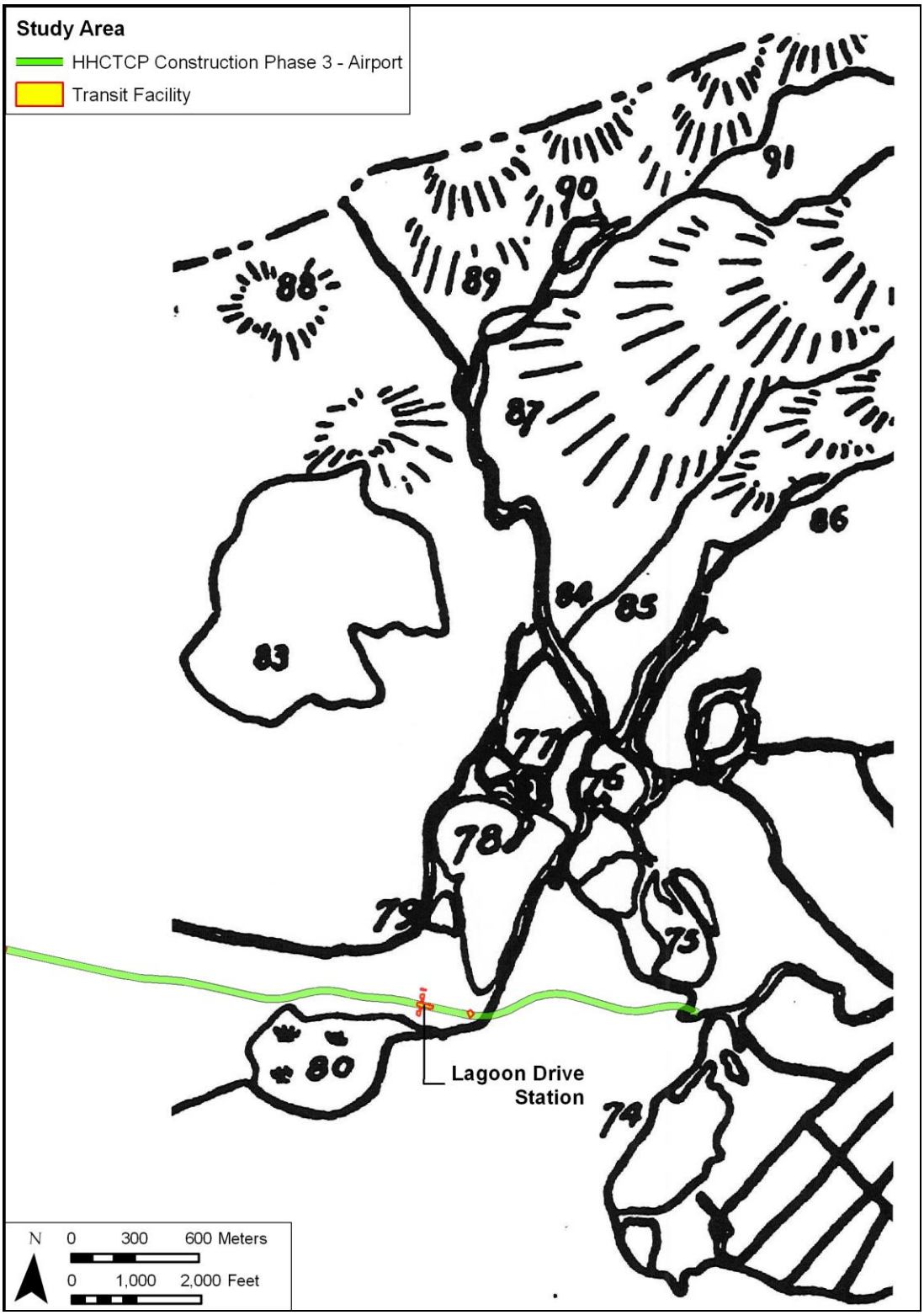

Figure 26. Overlay of Transit corridor on McAllister’s (1933:90) Map of Moanalua Valley showing location of (McAllister’s) Sites 74-80 and 83-91

Ku au eha helu ana oukou	Fourth month you count four
Ku au elima helu ana oukou	Fifth month you count five
Ku au eono helu ana oukou	Sixth month you count six
Ku au ehiku helu ana oukou	Seventh month you count seven
Ku au ewalu helu ana oUkou	Eighth month you count eight
Ku au eiwa helu ana oukou	Ninth month you count nine
Puni ka umi.	Tenth month is the end.
Papahi ke aloha i kuu manawa,	Then love flutters at my temple,
Kiei e ka la o lala e.	As the sun peeps there below.
A Hala a'e na la e ino	After the hard days are past
Manini au la a holo.	It grows and runs.

When Keliikanakaole heard this he became very sad, for the riddle appeared very difficult to him. He began inquiring of everyone he met for the answer. From Moanalua he went all around Oahu, but no one could give him a suggestion. When the allotted time was nearly at an end he returned to Moanalua. He was so disconsolate that he cared for neither food nor sleep and only brooded upon the fate that was in store for him. The people felt sorry for him and resented the arbitrary manner in which the chief was attempting to dispose of him. His plight was learned by Paeli, and he sent for the young man to come and. eat with him. Paeli felt that the chief had deceived him and he determined to save Keliikanakaole's life. The youth came but would not eat of the tempting food prepared. Why eat now when on the morrow he must die? Then Paeli told him to eat and drink and when they had finished, he would give him the answer to the riddle. Keliikanakaole was overjoyed and could hardly wait till the end of his meal for the answer which he had sought for so many months. After telling him, Paeli also warned him not to go near Kamahalolanialii, for he did not think that the chief could be trusted. When the time came for the answer to be delivered, Keliikanakaole climbed to a near-by hill in view of the chief and people who had gathered. Kamahalolanialii was so certain of his success that the *imu* had been prepared and was red-hot. From his distance on the hill Keliikanakaole went through the movements of the riddle. As he recited the first ten lines he remained perfectly still, which represented a life from conception to the point of birth. He then lay on the ground and as he said, “Then love flutters at my temple, as the sun peeps there below" he writhed in agony to indicate labor pains. While reciting "After the hard days are past," he imitated movements of nursing and caring for a child. During the last line he expanded and stretched himself and feigned running. The whole performance indicated the development of a life from pregnancy to

> youth. At the conclusion, Kamahalolanialii was greatly enraged, but he called to Keliikanakaole to come and receive his reward. But Paeli had warned the young man to flee if the chief called him. Immediately Kamahalolanialii commanded his men to follow and seize Keliikanakaole and put him to death. The young man ran to the shore where the chief's own fisherman, knowing of Keliikanakaole's predicament and sympathizing with him, hid him in a cave. When the warriors who were following the youth came to the old fisherman and asked if he had seen a young man who was running away, he replied that no one had come his way. Keliikanakaole remained in hiding until the death of Kamahalolanialii some time afterward.

Site 77. Poki, an apparition not peculiar to Moanalua but which has been seen in many places on the island. The most vivid description, however, was from a European living in Moanalua. [McAllister’s (1933:92). “Site 77” appears to designate “an apparition not peculiar to Moanalua.”]

> He saw Poki and, as he told me of the vision, I had not the slightest doubt but that he had seen it. It happened many years ago as he was returning from Honolulu on horseback. The moon had just risen, flooding the tops of ridges with light, which emphasized the blackness of valleys. He had just passed Fort Shafter and was beginning the descent into Moanalua when, with a sudden jerk, his horse stopped and stood trembling. In the distance arose the wailing of dogs. Glancing about, the rider saw coming off the ridge to his right a pale form. As he watched, it left the ridge and passed over, the dark valley. It was a shapeless, white form, a mist, convulsed with movement, but slowly and stately moving over the invisible treetops, clear and distinct against the black silhouette of the Koolau Range. As the apparition passed over the settlement, there preceded it the whimpering and wailing dogs, but in its path there followed a deathly stillness. Even after it was lost to sight, its presence could be followed by the ever attendant wailing. The rider, being an educated and intelligent gentleman, gives the following explanation at which he shrugs his shoulders and smiles. There is much loose dirt on the eastern ridge above Moanalua. The apparition may have been a small whirlwind illuminated by the rising moon. When asked, Namakahe1u rebuked me with, "Poki was seen many places on the island."

Site 77-A. Wakaina Heiau on the land of Umimua, Moanalua. (McAllister 1933:93) [McAllister probably intended to locate this *heiau* on his Moanalua site location map as his Site 77, see Figure 26; approximately 1 km *mauka* of the Transit alignment]

On the plateau now cultivated, mountain side of the Damon home Namakehe1u indicated the site, of which nothing remains. Thrum (79, 4), who called the heiau Umimua, says: "Heiau Pookanaka, about 100 by 70 feet. Some little distance below it is said to be its sacrificial stone. Its walls are yet to be seen, in ruins."

Site 78. Mapunapuna fishpond, Moanalua [McAllister places this approximately 600 m *mauka* of the Transit alignment, see Figure 26].

The pond is 40 acres in area with a wall 1600 feet long. The wall, 10 feet wide, 1 foot above the. water on the inside, and 2.5 feet high outside, is almost straight, enclosing a small inlet. There are now four outlets *(makaha).* The wall is principally of coral. Adjoining it on the landward side and near the Damons' house is a small pond said to have been called Keawamalia. It is surrounded by earth embankments.

Site 79·Awaawaloa fishpond, Moanalua [McAllister places this approximately 400 m *mauka* of the Transit alignment, see Figure 26]..

A small 8.8-acre pond with a coral rock wall 900 feet long. There are now two outlets *(makaha).* The wall is broken. The adjoining pond, known as Ahua, is said to be recent.

Site 80. Kaloaloa fishpond, Moanalua [McAllister places this approximately 200 m *makai* of the Transit alignment, see Figure 26]..

The pond is 36 acres in area with a semicircular wall 2700 feet long. The walls are of coral, 6 feet wide and 3 feet high. There are three outlets *(makaha).*

Site 81. Kaihikapu fishpond, Moanalua.

This pond, which is 258 acres in area, with a coral wall 4500 feet in length, 3 to 8 feet in width, and 3 feet high, and three outlets *(makaha),* was built by Kaihikapu-a-Manuia. In the vicinity there were apparently salt pans, for when Captain Brown ran short of salt, he was directed "to the saltponds at Kaihikapu" by Kalanikupule. While the crew was obtaining salt, Captains Brown and Gardner were killed by a party of Hawaiians under Kalanikupule and Kamohomoho.

Site 82. Le1epaua, a large inland fishpond, in Moanalua.

It is "332 acres, mostly filled," according to Cobb. The walls were coral and earth embankment, 10 feet or more wide. The pond was built by Kaihikapu-a-Manuia, and according to Dibble was the place at which Captain Brown obtained salt.

Site 83·Aliapaakai (Salt Lake), Moanalua [approximately 1,400 m *mauka* of the Transit alignment, see Figure 26].

Fornander describes this as the place at which Pele once thought to make her home:

> Upon their arrival at Oahu, Pele and Hiiaka took up their abode in Kealiapaakai, at Moanalu:" where they dug down i.nto the ground and made a home. On coming from Kauai they brought some red dirt and some salt with them and deposited these things in their new home. Because of this fact these places were given the names of Kealiapaakai and Kealiamanu. Upon finding that the place was too shallow they went to settle at Leahi.

In Kalawela's lamentation for Kahahana Thrum makes the annotation: "Alia, a salt pond, was the place where the souls of the dead were supposed to descend to the nether world." This may be confused · with 'the place mentioned by Kamakau near Kapukaki. (See Sites 88, 186):

According to Jarves (43, p. 7) it was thought to have a hole in the center " ... five to six fathoms in circumference which, as no bottom has been found to it, is supposed to connect with the ocean. Through this the lake is slightly affected by the tides." Wilkes reported, however, that "No fathomless hole was to be found, and no greater depth than eighteen inches."

In the vicinity of Aliapaakai, Kotzebue (51, vol. 1, p. 343) observed " ... several tapa plantations; a tree, of the bark of which the cloth of this country is manufactured."

Site 84. Namakalele, "Flying Eyes," a small land section in Moanalua [McAllister places this approximately 1,800 m *mauka* of the Transit alignment, see Figure 26].

> Here Keawe and his wife Keanahaki lived happily many years ago. Daily he went to the mountains cutting wood, gathering plants, and doing other chores. As soon as he could he hurried home and then out to the sea to fish. His whole day was filled in and he had little time for his family, which was steadily increasing. This routine life continued until after the birth of his sixth child. Then one day his wife said, "While you go to the mountains, I will fish." Keawe agreed and then went to the mountains as usual, and Keanahaki started for the sea. On her way she felt peculiar and realized that another self was coming to her. Halfway down she stopped and chanted, asking that the lower portion of her body be made stationary while the upper portion went to the sea to fish. She then continued to the shore, where she stood and again chanted. Telling her right eye to fly to the sea and bring certain fish, then to her left eye to fly in another direction and catch other fish. After some time, she called to her right eye to return. It fluttered back, bringing many fish. Later the left eye returned bringing more fish. These she divided into portions for her husband, children, and herself. Then she not only ate her share, but continued eating until only one fish remained. This she took home. When her husband saw this small catch he naturally was disappointed. "Was this all you were able to catch?" he inquired of her. "Yes," she ' replied. For many consecutive times Keanahaki returned with only one fish, which greatly dissatisfied Keawe. He reasoned that a person could not continually have such bad luck. Then he learned from a friend that his wife was no normal being. She had unusual ' powers, he was told. As she stood by the shore, her eyes out at sea caught the fish. If Keawe would gather leaves from the *ipuawaawa* vine, he would be able to catch and preserve the eyes of his wife, should he follow and watch her when she went fishing. So one day Keawe pretended to go to the mountains as usual, but he waited and watched for

> his wife to go fishing. When she did, he followed her. As soon as Keanahaki got to the shore she again chanted for her right eye to fly over the sea and fish for certain fish and for her left eye to fly in another direction and bring in other fish. Keawe watching her was astounded. He came very close to his wife, but she could not see him, for her eyes were gone. When she called to her eyes to return he caught them as they flew back with the fish. Carefully he wrapped each eye in some leaves of the *ipuawaawa.* Then he gathered the fish and went home, while his wife stood on the shore calling for her eyes and wondering why they did not return. When·Keawe reached his grass hut, his children gathered round and were proud of the catch father had brought in. He left them admiring the fish and went to the hut to hide the eyes. He did not know that the smallest child, the sixth, had noticed the 'small bundle and followed and watched his father place it on a high ledge. In the meantime Keanahakl waiting; on the beach for her eyes to return, became suspicious of what had occurred. Stumbling and groping, she slowly found her way home. There her six children gathered around. She asked them if their father had returned "Did he bring anything with him ?" Yes, they replied, "a large mess of fish." "Didn't he have anything else? A small bundle that he didn't open?" No five of them had seen nothing more; but the smallest told his mother that he had seen his father with a small bundle wrapped in leaves and watched him place it on a high ledge. "Show me where," the mother said, and the youngster led her to the place. After groping about Keanahaki found and restored her eyes to their sockets That is why this place is known as Namakale1e.

Site 85·Kaualua or Kauwalua “House of Bones” [McAllister places this approximately 1,800 m *mauka* of the Transit alignment, see Figure 26].

Kaualua or Kauwalua in Moanalua has received attention from a number of writers, probably because of the unusual and bizarre nature of a "house of bones" which was 'located at Lapakea in Moanalua Va1ley. It is a small land on the plateau between Puukapu and Puu o Ma‘o, Inland of the highway. According to my informant, Namakahelu:

> Kaualua ·was constructed by Kala1akoa (Kalaikoa) when he was chief of Moanalua. He was in the habit of stationing himself at a prominent place along the roadway; probably not far from Puukapu, and waylaying travelers After over powering them in hand-to hand combat, he would kill them and remove the long bones with which he was constructing a fence around his grass hut. This continued for many years· and the people were m great fear of him and would go many miles out of their way, frequent1y traveling by canoe, rather than pass his house, When this fence had almost been completed except for one more set of bones, there arose a warrior, by name Kaluaihalawa. He gathered together a large group of people and expressed his intention of attempting. to kill Kalalakoa. The people went

> with him to the foot of Puukapu where they remained while he climbed to the top of the hill where Kalalakoa was watching. As Kaluaihalawa neared the chief, he told him that he had come to fight "It means death," Kalalakoa replied. "Then let me rest and get my breath" said Kaluaihalawa, to which the other agreed. After an interval, Kalalakoa again warned the warrior that the outcome meant death, but Kaluaihalawa lunged forward and tripped the chief toppling him over and throwing himself upon him and killing him The people who were watching below sent up a mighty cheer.

The portion of the account dealing with Kaluaihalawa as given by Namakahelu differs from all other records. Fornander writes as follows:

> Fearfully did Kahekili avenge the death of Hueu on the revolted Oahu chiefs….It is related that one of the Maui chiefs, named Kalaikoa, caused the bones of the slain to be scrapped and c1eaned, and that the quantity collected was so great that he built a house for himself, the walls of which were laid up entirely of the skeletons of the slain. The skulls of Elani, Konamanu, and Kalakioonui adorned the portals of this horrible house. The house was called "Kauwalua," and was situated at Lapakea in Moanalua, as one passes by the old upper road to Ewa. The site is still pointed out but the bones have received burial.

The following account was obtained by Stokes:

> Kalaikoa was chief of the district, lived right by the old highway where it crossed the cliff, and occupied himself by waylaying the travelers and killing them for the purpose of getting their bones to build a fence around his house. He was secure from reprisals, as he had a strong body of soldiers at his call. After killing his victims he extracted the long arm and leg bones and planted them upright in the ground to make a low palisade. Retribution overtook the bloodthirsty chief, for when he had the fence completed, except for the bones of one man, he died, and his bones were used to fill the gap. -
>
> [The fence was] composed of the leg and arm bones placed erect in the ground as close together as the fingers when relaxed. They were not tied. There was a single line of fence, making a square enclosure, one side of which was 50 feet (paced) . In this enclosure was a large stone platform on which the grass house had stood, but there was no house standing when he [Mr. Stokes' informant] first saw the place. Well outside the enclosure, 60 feet to the south, was a small house, built entirely of stone, into which the remaining portions of the murdered bodies were put. He had seen the house there himself. The house was not an *imu* but of proper house shape, large enough for the body of a man. The road passed between this and the fence. This house the old man spoke of as a "heiau" dedicated to the war god Kaili. It had walls three feet high and four feet wide, with a pitched

> roof of stone and a door facing the bone fence. Outside the door was a stone pavement, where the priests gathered.

Corney visited this site in 1818 on his way from Honolulu to Pearl Harbor :

> In my tour with Mr. Manning (Manini), we visited the ruin of a large stone house, or fort, which had formerly belonged to a great chief; it had a double fence of human bones around it; these were the bones of his enemies killed in the war before the islands were visited by Europeans. The bones of this great chief are said to be still in the house; the natives are afraid to go near it; preferring to go a round of five or six miles to passing it.

Nothing at present remains of this site, though the possible burial place of the bones from the fence is still in evidence. (See Site 88.)

Site 86. Probable Heiau, Moanalua district [McAllister places this approximately 2 km *mauka* of the Transit alignment, see Figure 26].

Located on the side of the ridge facing the stream in the valley, a northwest direction, is a small heiau with practically an open terrace, for there is only one wall 3-5 feet high and wide which delimits a portion of the southwest side. The terrace is almost entirely rock-paved, and toward the center of the back is an area which appears as if it might have been the foundation for some structure with a slight terrace surrounding it. The slope in back is rather steep, with several convenient shelters which bear evidence in the form of bits of mats and broken gourds of having been frequented and probably used as habitations.

Site 87. Burial cave, Moanalua Valley [McAllister places this approximately 2.5 km *mauka* of the Transit alignment, see Figure 26].

On the cliff northeast of the highway just" before turning into the road which leads to the golf club is a burial cave. The mouth was at one time closed with a facing of stones, but has since been opened and the cave looted, the fragmenta'ry remains of skeletons being scattered within. The remains of two coffins near the entrance indicate post-European use of the site. A half-dozen people can comfortably seat themselves within the chamber. No old burials were evident.

Site 88. Terrace facings (?), Moanalua Valley [McAllister places this approximately 3 km *mauka* of the Transit alignment, see Figure 26].

On the north side of the rather level top of Puukapu, or Kapukaki, are a great many stones which appear to have been the facing of a terrace 115 feet long and probably 30 to 40 feet wide. This stone facing on the north is now greatly disturbed but the remains are sufficient to indicate its former regularity. It is 10 feet wide and 5 feet high, with a number of square depressions side by side, not more than 1 to 2 feet deep, and averaging 5 feet across South of the terrace is the rather precipitous slope into Aliamanu, a crater-like depression with Aliapaakai (Salt Lake) adjoining farther south. The survey triangulation station is just west of the terrace. The structure is so old that Mr. Douglas Damon was unable to

discover the significance of the site from the Hawaiians. Only one of those of whom I inquired had knowledge of the place and she, Namakahelu, told me that here the bones which had formed the fence of Kaualua (Site 85) were buried.

Macrae undoubtedly visited this site May 18, 1825. He makes the following notation:

> By 4 P. M. we gained the summit of a high hill thickly covered with tufts of long grass. It lies within three miles of Hanarura. There is a burying ground of the natives at the top which was formerly where the chiefs of high rank had a morai [heiau]. At the bottom toward the sea, there is a circular salt pond [Aliapaakai], nearly two miles in circumference, surrounded by low conical hills.”

The location and features of the site lead me to believe it was a heiau. Namakahelu knows it as a burying ground. Macrae describes it as an old heiau used as a place of burial, which may explain the disturbed condition of the stones. When the bones were removed from Kaualua (Site 85) this old heiau terrace was probably thought to be a suitable and logical place for burial.

Kamakau speaks of "The burial mound of Aliamanu, which may possibly be this same site. In the vicinity of Kapukaki was an entrance to the nether world [Site 186]."

Another reference to this same site was made by Lyons:

> “One (*ahupua‘a*) near Honolulu may still be seen on the north external slope of the crater of Salt Lake. This, besides marking the boundary of Halawa and Moanalua, marked also the limits of the Kona and ‘Ewa districts."

Site 89. Pu‘u oma‘o stone with figures in relief [McAllister places this location approximately 3 km *mauka* of the Transit alignment, see Figure 26].

Puu o ma‘o, the cliff forming the eastern side of Moanalua Valley. This site on Puu o ma‘o is the approximate place where a stone with figures in relief was found several years ago, at a depth of several feet. The stone is now in the Damon gardens before the house occupied by Kamehameha IV and Kamehameha V. The figures have been described in great detail by Stokes:

> The stone is an irregularly shaped piece of rather finely cel1ular basalt, measuring 31 inches long, 21 wide and 17.5 thick, the face of which has been careful1y worn down by hammering … leaving the representations of two human figures in relief … The measurement from head to foot [of the figure on the right] is 11.8 inches … The hand has only three fingers.

The height of the relief of the figure on the right, which is the most distinct, averages about 1 inch. The other figure measures 10.2 inches from head to foot. It is believed that the figures are of Hawaiian conception, but they resemble neither

the carved wooden images nor the petroglyphs. They are unique in presenting a profile view, in the squatting position of the figures, and in the detail of the limbs.

Site 90. Paliuli Heiau, on the north side of Moanalua Valley about 1 mile above Salt Lake [McAllister places this approximately 3.2 km *mauka* of the Transit alignment, see Figure 26]..

Only two portions of the heiau are now discernible. One is a small elevated terrace which is divided by a line of flat stones placed upright on their long sides. The back of this area was similarly marked off. No trace of stepping can now be found on the front of the long slope. Some 30 feet back and above this terrace is a bluff 10 to 20 feet high with a cave at its foot. This was formerly used as a place of burial, according to Douglas Damon, but as the contents were gradually being carried away and the bodies subject to the disrespect of curio hunters, the remains were burned some years ago. A wall begins near the upper terrace and continues along the side of the hill for some distance. It not only has the appearance of recent construction, but does not seem to form a part of the heiau.

The second portion is a lower terrace ; a part of the front side stil1 shows evidence of having been evenly faced and stepped. A portion of a tibia was seen imbedded between the rocks about one foot deep. Upon further examination, a crushed skull which was wedged between the rocks 1.5 feet deep was seen a few feet from the tibia. Both appear to have been placed at the time or before the building of the terrace. It is possible that this terrace suggested a good burial ground to the Hawaiian after the heiau felt into disuse in missionary times, as in Sites 293, 329, 371. If this happened, a large number of stones were removed and then replaced so as to appear undisturbed.

There were probably other features of the site, for many stones had been removed before Mr. Damon could stop a workman whom he found dislodging stones on the heiau. These stones were not replaced but were evenly piled in circles a few hundred feet below the site.

Site 91. Koaloa Heiau, Honolulu side of Moanalua Valley, about halfway up the Side of the ridge [McAllister places this approximately 3.6 km *mauka* of the Transit alignment, see Figure 26].

The front of the terrace is visible from the road in the val1ey. The entire structure is approximately 93 feet front by 50 feet wide, built of the rather rough lava rocks found in the vicinity. It appears to have been but a single main terrace, with steplike ledging in front, two smaller areas on either side, and one or possibly two small terraces, which probably formed the oracle tower site, in the back-center against the steep slope. The large stone just north of the main terrace may or may not have had any connection, though the stone paving which surrounded it, except in front, would indicate that it had a function. The heiau was undoubtedly approached by an incline which zigzagged up the front. The slope back of' the terrace is steep and in places precipitous.

Site 92 . Waiola pool, Halawa side of Moanalua Valley above the mountain home of Mr. Douglas Damon.

The pool is said to have medicinal qualities. The old Hawaiians came here to bathe when they were recuperating from illness.

Site 93. Pōhaku ka lua hine Petroglyph Bolder

Toward the head of Moanalua Valley by the side of the stream on the land known as Kahalelauki is a stone 11 by 8.7 feet by 3 feet high, which is known by the name of Pohaku ka lua hine The current tradition regarding the stone foIlows:

> During the consecration of a heiau in Moanalua Valley, a smal1 child cried. Now, noise made by man or animal during such tapu periods meant instant death for the offender. The grandmother, desiring to protect the child, ran with it up the valley and hid behind this rock. Men were sent out in search, but were unable to find them. After the elapse of the tapu period of a few days, the woman and the child were safe and returned to their home. Namakahelu, the oldest living kamaaina of Moanalua Valley, is of the opinion that this is a recent story. The stone, she says, was sacred, an akua, with at least two forms of which she knows. As a stone it was known as Laupo, and as a bird it was known as Laea. Offerings were placed before it. On the top and sides were a number of petroglyphs, probably many more formerly than now, for there are a number of indistinct depressions which may or may not be artificial. Portions of the konane board which was on a flat portion of the upper side, have been badly weathered.

The *konane* board measures 22 by 27 inches, with 90 holes, 9 rows on the short side arid 10 on the other. Aside from the board there are 22 carvings that are sufficiently distinct to form definite patterns. Nearly all are human figures. Aside from those shown, there are many depressions scarring the face of the rock which are not definitely limited and may be natural. Some were undoubtedly artificial, but continued weathering has obliterated distinct features …

In summary, the 19 “sites” McAllister recorded at Moanalua include:

- five fishponds (named Mapunapuna ,Site 78; Awaawaloa, Site 79; Kaloaloa, Site 80; Kaihikapu, Site 81; and Lelepaua, Site 82);
- five storied places (including a legendary *imu*, Site 76; Āliapa‘akai or Salt Lake, Site 83; a land-section associated with the “Flying Eyes”, Site 84; the “House of Bones”. Site 85; and a medicinal pool; Site 92);
- an apparition of no specific provenience (Site 77);
- a burial cave (Site 87);
- an area of terraces (Site 88);

- two rock carving sites (Site 89 the location of an unusual relief carving and Site 96 the famous Pōhakuka luahine petroglyph boulder of Moanalua Valley); and
- four *heiau* – (Wakaina, Site 77-A; Paliuli, (Site 90; Koaloa, Site 91; and an unnamed "probable" heiau; Site 86).

By the 1970s, all traces of the named heiau had been lost; T. Stell Newman writes:

> A search was made in 1970 for Paliuli, Koaloa, and Umi Mua (or Wakaina) heiau by B. Jean Martin and myself as part of the Statewide Inventory effort. Working from a copy of the original McAllister base map (not the simple drawing in the published volume), we determined McAllister's locations for Paliuli and Koaloa heiau and made a field check at these two locations. The location of Paliuli is now covered by residences and no trace of the heiau remains. Although the major part of a day was spent searching the hillside where McAllister plotted Koaloa heiau, no trace of it was found. It was probably destroyed by the old, now abandoned, road that winds up the mountain side. Ms. Martin and I also thoroughly checked the area where the heiau at Umi Mua was said to have been located after being shown the spot by Frances Damon Holt - without finding a trace of it. [Newman et al. 1973: 23]

None of the historic properties recorded by McAllister are in the immediate vicinity of the current project area (see Figure 26). The properties are generally situated at lower elevations along the coastal plain and along the flat bottoms of the two major valleys - Kamana-nui and Kamana-iki - of the *ahupua‘a*.

However, one property - a burial cave (Site 87) - is located to the south of the junction of Moanalua Road and Ala Aolani Road, near the base of Tripler Ridge:

> On the cliff northeast of the highway just before turning into the road which leads to the golf club is a burial cave. The mouth was at one time closed with a facing of stones, but has since been opened and the cave looted, the fragmentary remains of skeletons being scattered within. The remains of two coffins near the entrance indicate post-European use of the site. A half-dozen people can comfortably seat themselves within the chamber. No old burials were evident. [McAllister 1933: 96]

The cave was further studied in 1964 by Lloyd Soehren of the Bishop Museum. Excavations in the cave floor exposed, at the lower levels, traditional Hawaiian artifacts (including bone and shell fishhooks, basalt adzes, a dog or pig tooth pendant, and cores and flakes of volcanic glass), organic material and midden pointing to a shelter or habitation function for the cave prior to its use during the historic-era as the burial repository noted by McAllister.

In a 1980 proposal for further archaeological investigation of the cave site, Bertell D. Davis and M.W. Kaschko suggest that it "functioned primarily in the context of people and goods moving back and forth between the coastal and upper valley areas"; and further:

> What the nature of this seaward-landward traveling may have been is not certain. Early in the settlement period it may have involved only intermittent treks from the coastal settlement back into the upper valleys to gather wild forest products.

> Later travel may then have become more regular as settlement extended further and further into the valleys. But whether these upland residences represent short-term or long-term occupation remains a question. [Davis and Kaschko 1980:8-9]

The possible pre-contact settlement and the archaeological resources extant within the upland areas of Moanalua would become a question of special concern during the 1960s and 70s when Kamana-nui Valley - the westernmost of the two major valleys of Moanalua - was proposed as a route for the H-3 Interstate Highway. The floor of Kamana-nui Valley was surveyed in 1970 by archaeologists from the Bishop Museum (Ayres 1971). The survey located 57 historic properties, including: terraces, a pre-Christian shrine, house platforms, and two petroglyph rocks. The survey report concluded that “utilization of Kamana-nui Valley by prehistoric populations was limited but does show evidence of having been of greater significance than was previously thought” and “both agricultural and residential units were developed in this valley” (Ayres 1971:35). Further:

> It is believed that the terraces in the upper portion of Kamana-nui Valley represent a time period when the local population reached a high level and indicate attempts by individuals or family groups to delineate clearly their agricultural tracts. [Ayers 1971:33]

Two historic properties have been documented within the Tripler Army Medical Center (TAMC) property. Both historic properties were recorded during an archaeological reconnaissance survey of the TAMC conducted by archaeologists from the Bishop Museum on November 10, 1976 (Rosendahl 1977). The TAMC study was a portion of a survey project that included:

> …all lands owned or controlled by the Army within the State of Hawaii, [comprising] 34 individual installations totaling 174,237.16 acres…Because the overall project area was far more than could be adequately surveyed in full, individual installations were survey-sampled. Areas to be sampled were selected on the basis of literature search and aerial photograph analysis. (Rosendahl 1977:1-i).

Of the total 367.17 acres comprising the TAMC, approximately 202 acres were deemed to have potential for having archaeological features - the excluded acreage having been “modified to such an extent that it could no longer possibly have [surface] sites” (Rosendahl 1977.:1-11) - and the actual survey-sampled area consisted of 36.7 acres. The two historic properties are located in the broad gully on the northwest side of the TAMC, below the gymnasium building and the enlisted men's barracks.

SIHP # 50-80-14-9504 is called the “Moanalua Complex” and is described as comprising a small, crude platform of stacked stone and piles of stones from clearing activities. SIHP # 50-80-14-9505 is called “Moanalua Terraces” and is described as consisting of crude retaining walls defining terraces and possibly a house platform. Both historic properties were evaluated as in poor condition and no positive dating (i.e. whether pre-contact or historic) of them was possible. The sites are further evaluated as historic properties of value which should be preserved if possible (Category III - Section 4-1, Historic Property Evaluation; TM 5-801-1: Technical Manual, Historic Preservation Administrative Procedures, Headquarters Department of the

Army, 1975) and the report notes that “although the sites are of minimal potential for research and/or interpretation, they are suggestive of patterns of past human occupation in this dry environment” (Rosendahl 1977).

In 1994, an archaeological assessment of the TAMC property was conducted by Cultural Surveys Hawai‘i (Hammatt and Chiogioji 1994). The previously identified SIHP #s 50-80-14-9504 and -9505 were relocated and documented with formal historic property descriptions, scale drawings, and photographs.

Portions of the TAMC were later investigated by archaeologists from Ogden Environmental and Energy Services Co., conducting an archaeological surface survey of project areas of a proposed VA Medical Regional Office Center (Hurst and Williams 1994). These sites included:

> ...the proposed Parking Garage, Center for Aging, Reproduction/Administration Facility; and the DPW Entomology Shop areas. These areas were selected as the most likely areas to contain surface archaeological sites or evidence for subsurface deposits. [Hurst and Williams 1994:1]

No surface historic properties or evidence of possible subsurface deposits were observed. The archaeologists suggest further investigation - archeological monitoring during initial vegetation clearing and grading - of one area:

> Of the various project components, only the area proposed for the new parking garage appears to have favorable conditions for intact subsurface cultural deposits, and even there the potential is very low. The potential for subsurface deposits in the parking garage area is assumed to be somewhat more favorable than other areas in TAMC because the parking garage will be built within a small gully that does not have any structures within it. If remains are present, they are likely to be isolated earth ovens, firepits, charcoal concentrations, or lithic debris. No surface remains were located in the gully, but a dirt road had been recently graded into the gully and the material pushed down the slope, possibly burying surface remains. The area of the gully above the road was also examined, however, and no remains were present; this makes it highly unlikely that any surface features were buried by material pushed from the road. [Hurst and Williams 1994:18]

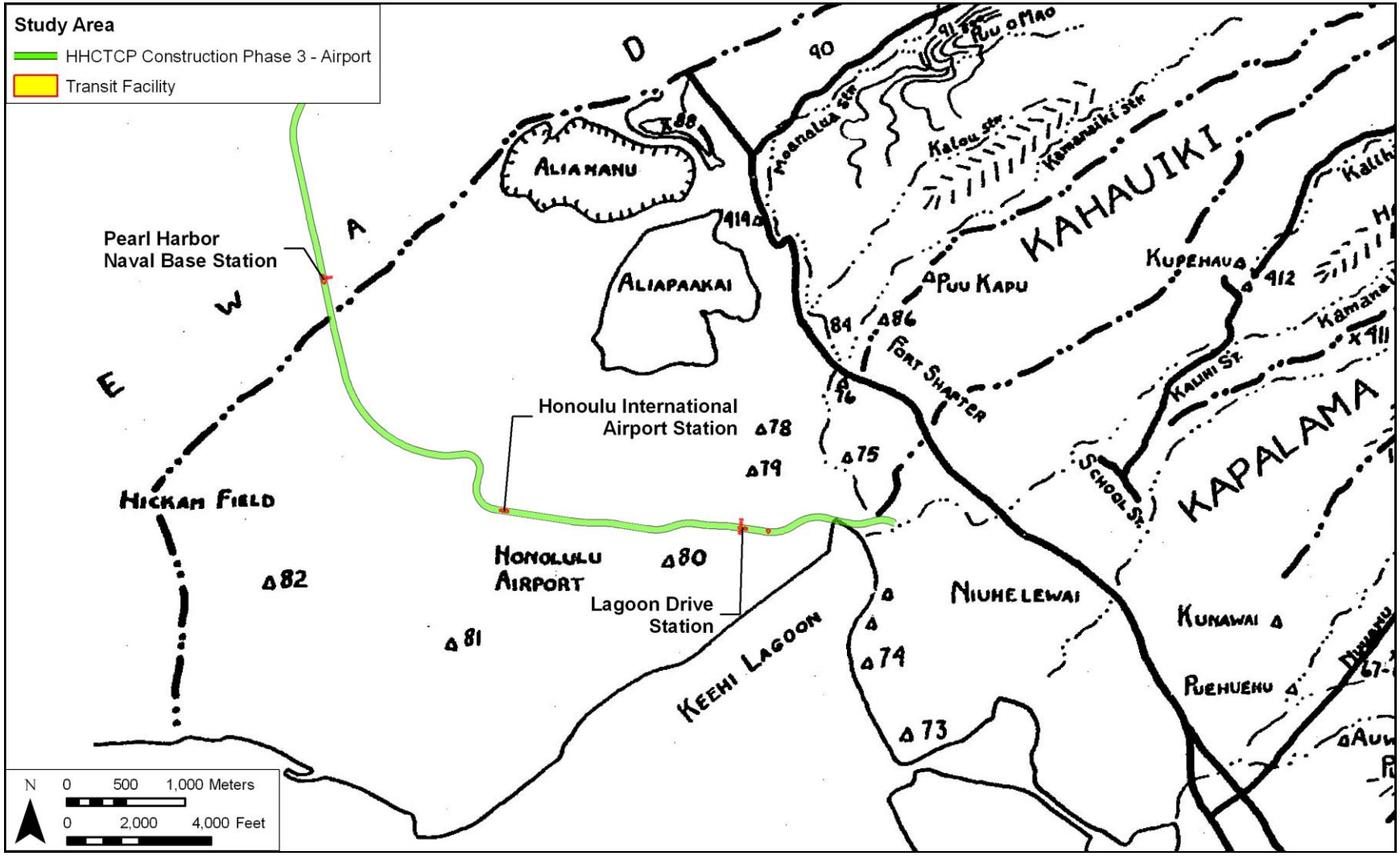

Figure 27. 1959 Bishop Museum site location map (adapted from Sterling and Summers) showing neighboring fishponds (Site 80 is the Kaloaloa Fishpond, Site 81 is the Ka‘ihikapu Fishpond & Site 82 is the Lelepaua Fishpond)

Table 9. Previous Archaeological Studies at Moanalua Ahupua‘a (not including Hickam Air Force Base and Fort Kamehameha studies)

Source	Type of Investigation	General Location	Findings
Cobb 1905	Fisheries Inventory	Territory-wide	Fishponds in Moanalua include: Lelepaua (332 acres, mostly filled up), Kaihikapu (258 acres)
Stokes 1909	Study of walled fish traps	Pearl Harbor	Located former fish trap at Bishop Point
McAllister 1930	Early survey	O‘ahu Island	Site 81. Kaihikapu Fishpond, Site 82. Lelepaua a large inland fishpond at Moanalua, Site 94. Loko Waiaho, known as Queen Emma’s pond, Site 95. Loko Ke‘oki was a pond near Watertown, Site 96. Papiolua Fishpond in Hālawa
Barrera 1979	Archaeological Reconnaissance	Salt Lake District Park	Possibly relocated a previously identified rockshelter indicated on a State Historic Preservation Office map (#50-80-13-500). Survey incomplete due to difficult terrain.
Connolly 1980	Archaeological Reconnaissance	Salt Lake District Park	Identified 1 overhang shelter, a possible temporary habitation with human burial remnants (#-3992). Report referenced Bishop Museum excavations in 1961 and 1964, which documented #-500 (containing cultural deposits) and Bishop Museum Site Oa-A7-21, (containing midden, adzes and adz fragments, fishhooks, a pumice disk, and a canine tooth). Due to steep slopes was unable to examine several other rock overhangs.
Sprinkle, 1996	Cultural Resource Investigation	Proposed Detention Facility	Not found in SHPD library

Source	Type of Investigation	General Location	Findings
Tomonari-Tuggle, 1998	Archival Background Research	Honolulu Airport Post Office	Concluded that was little probability of intact archaeological deposits within the project area. Research indicated that the project area and vicinity was likely not used in any intensive way during the pre-contact era
Athens, and Ward 1999a	Paleoenvironmental Coring Report	Ka‘ihikapu Fishpond, Vault-X Project, Honolulu International Airport	Site 50-80-13-81 fishpond research – no sediments from pre-Contact Polynesian period
Yucha and Hammatt 2008	Archaeological Monitoring Report	Undeveloped 22-Acre Portion of the SDOT’s HIA Terminal Modernization Elliott Street Project	No cultural deposits were identified. The project area’s subsurface deposits appear to be intact near the present water table at depths between 1-3 m (3-10 ft) below the modern level ground

4.5 Archaeological Studies in the Immediate Vicinity of the Project Area

As can be seen from Figure 24 there have only been three areas in neighboring Hickam in which sites have been designated. Two of these designated sites lie nearly four kilometers to the southwest on the eastern margin of the entrance to Pearl Harbor in what was clearly an intensively used area in traditional Hawaiian times. The nearest designated site (shown as locale "c" on Figure 24), and the only one within three kilometers, consisted of three pit features (Desilets 2002a) designated as site 50-80-13-6406. While finds were limited to thermally altered limestone, charcoal and very sparse quantities of midden the carbon dating ranges obtained of AD 1478 – 1664 and 1306 – 1452 include the earliest reported date for Hickam AFB. This appears to be the only site designated in the eastern half of the Hickam AFB lands in the past 70 years.

The closest studies such as the Carlson, 2001 study of the Manuwai Canal found no significant finds. In addition, Cultural Survey's recent archaeological investigation (Yucha and Hammatt 2008) of six geo-technical test borings in the 22 acres of undeveloped land to the southwest of the current project area's western parcel evidenced no cultural deposits.

A consideration of the results of some 54 archaeological studies that have taken place at Hickam AFB since Anderson and Bouthillier (1996) produced their sensitivity map suggests that the designation of a large area of inland east Hickam AFB as of high archaeological sensitivity may not be completely accurate. At the time of the creation of the Anderson and Bouthillier (1996) sensitivity map there had not been a single archaeological study east of the present western reef runway taxi approach, which is to say there had not been a single archaeological study within two kilometers of the present project area. We now know a great deal more about the likelihood of significant subsurface deposits in eastern Hickam and the likelihood appears to be not high or even moderate but, as a generalization may be expected to be rather low.