DRAFT ENVIRONMENTAL ASSESSMENT

WAIʻANAE POLICE STATION REPLACEMENT

Waiʻanae Kai, District of Waiʻanae, City and County of Honolulu, Hawaiʻi

Prepared For

Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawaiʻi 96813

March 2010

DRAFT ENVIRONMENTAL ASSESSMENT

WAI'ANAE POLICE STATION REPLACEMENT

Wai'anae Kai, District of Wai'anae, City and County of Honolulu, Hawai'i

Prepared In Fulfillment of the Requirements of Chapter 343, Hawai'i Revised Statutes, and Hawai'i Administrative Rules Title 11-200

Prepared For

Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813

Prepared By

Gerald Park Urban Planner
95-595 Kanamee Street #324
Mililani, Hawai'i 96789

and

William Chang Architect
1976 Judd Hillside Road
Honolulu, Hawai'i 96822

March 2010

PROJECT PROFILE

Project:	Wai'anae Police Station Replacement
Proposing Agency:	Department of Design and Construction City and County of Honolulu 650 South King Street Honolulu, Hawai'i 96813
Approving Agency:	Department of Design and Construction City and County of Honolulu
Location:	Wai'anae Kai, Wai'anae, O'ahu
Existing Police Station:	Tax Map Key: 8-5-008: 043: 0.2898 acres (12,625 sf) 051: 0.5696 acres (24,811 sf)
Expansion Area:	por. 040: 0.2521 acres (10,979 sf) 041: 0.2135 acres (9,298 sf) por. 044: 0.3946 acres (17,186 sf)
State Land Use Designation: General Plan: *Sustainable* Communities Plan: SCP Land Use Map: Public Infrastructure Map Zoning: Special Management Area	Urban Rural Wai'anae Rural Residential No "PS" Symbol R-5 Residential Inside Special Management Area
Existing Use:	Police Station and Parking Lot Vacant Land
Need for Environmental Assessment:	Section 11-200-6 (b)(1)(A) and (b)(2)(B) Use of county lands and funds
Anticipated Determination:	Finding of No Significant Impact
Contact:	Curtis Kushimaejo Department of Design and Construction City and County of Honolulu 650 South King Street Honolulu, Hawai'i 96813 Phone: 768-8455

TABLE OF CONTENTS

FIGURES

TABLES

PHOTOGRAPHS

SECTION 1
DESCRIPTION OF THE PROPOSED ACTION

The Department of Design and Construction, City and County of Honolulu, proposes to replace the existing Honolulu Police Department Waiʻanae Substation ("Substation") located at Waiʻanae-Kai, District of Waiʻanae, Oʻahu, Hawaiʻi. The existing Substation is located in the center of Waiʻanae Town *makai* of and adjoining Farrington Highway near its intersection with Pōkaʻī Bay Street. It is bounded by Farrington Highway to the east, a fast food drive-in, single-family residence, and Pōkaʻī Bay Street to the south, three vacant lots to the west, and a vacant lot to the north off Farrington Highway and a single-family residence off Bayview Street. The Substation occupies two lots identified as Tax Map Key 8-5-003: 043 and 051 with a combined area of 37,436 square feet. A Location Map, Vicinity Map, and Tax Map are shown in Figures 1, 2, and 3.

A. Purpose of the Proposed Action

The proposed action will implement the Honolulu Police Department's ("HPD") vision to restructure its West Oʻahu patrol region. The patrol region presently services ʻEwa and Leeward communities between ʻEwa and Kʻaena Point. Reapportionment of the large patrol region will create a new Waiʻanae Patrol District 9 to improve and focus policing coverage for the Waiʻanae coastline from Nanakuli to Kʻaena. HPD envisions the replacement of the district-level station as the base-quarters for the new Patrol District 9 (Chang, 2009).

B. Technical Characteristics

1. New Station

The existing Substation and storage building will be demolished and a new Police Station built in their place. A two-phase construction program is projected. A rectangular 2-story structure of approximately 23,500 gross square feet will be built in Phase I. Ground level space is provided for a vehicle sally port, receiving and holding areas, administrative offices, squad rooms, and public area including an entry lobby and exterior waiting area. Space for a police exercise room, restrooms, showers, and lockers comprise the major uses of the 2nd floor (See Table 1). The Phase 1 building will provide a basic district-level station with complete booking and holding functions and facilities.

Phase 1 includes replacing the City's radio communication facility consisting of a radio equipment building, self-supporting tower, and a monopole. The radio equipment will be located on the second floor and tower installed on the roof of the new Station.

The second floor will be constructed as loft space in Phase I and built out in Phase 2. This space will accommodate expanded Administrative, Patrol, and Investigation functions. Phase 2 completion will provide HPD the required space to operate as a bona fide district level station. A Site Plan is shown on Sheet A-1 and 1st and 2nd level Floor Plans on Sheets A-2 and A-3, respectively.

The new station will be air conditioned. Fans, chillers, condensers, and supply and return vents will be roof mounted. A wet stand fire sprinkler system will be installed per Fire Code.

Table 1. Wai'anae Police Station Space Allocation

Phase 1	Schematic Design Net Area (SF)
Public Area	1,576
Administration (Captain's Office)	145
Receiving/Booking/Holding	3,742
Patrol	2,779
Auxiliary Functions	3,984
Support Space	447
Phase 1 Net Area	**12,673**
Phase 2	
Administration	1,694
Patrol	1,348
Investigation	2,139
Phase 2 Net Area	**5,181**
TOTAL NET AREA	**17,854**

Source: Architects Hawaii, 2009.

The building will be erected on poured in place concrete foundations and floor slabs. Exterior walls will be constructed of poured in place concrete or cement masonry units and "hardened" for protection against hurricanes. Precast prestressed planks with concrete topping will support the second floor and roof. A tile mansard roof will provide a sloped platform for photovoltaic panels and conceal roof mounted mechanical equipment.

At approximately 38 feet in height, the Station will exceed the 25-foot height limit for the zoning district (See Sheet A-5 Exterior Elevations).

The building will be setback 20 feet from its current property boundary along Farrington Highway. This setback is in anticipation of a planned State Department of Transportation initiative for a future 12'-0" widening of the highway, a 5'-0" front yard setback for the Community Business (B-2) zoning district plus an additional 3'-0" for aesthetic reasons. Setbacks along side yard boundaries abutting residences on the north and south will equal or exceed Land Use Ordinance standards.

2. Access and Parking

The existing police vehicle entry to and from Farrington Highway on the Mākaha end of the Substation will be maintained as the primary police vehicle access to the Station and parking area. The existing curb cut of 22-feet wide will be retained.

The current parking layout inside the vehicle entry and the parking area to the rear of the Substation will be reconfigured. Sixty-four off-street parking stalls will be provided for police vehicles. Eight stalls are proposed along the side yard on the north opposite the sally port. Fifty-six stalls will be located in a new parking area to be constructed between the new Station and Pōka'ī Bay Beach Park.

HPD and the Department of Parks and Recreation ("DPR") will sign a Memorandum of Agreement ("MOA") in which the DPR will relinquish some land *mauka* of Bayview Street to the Police Department for parking. The affected lots, identified as Tax Map Keys 8-5- 008:

040 (0.251 acres), 041 (0.2135 acres), and 044 (0.3946 acres) were proposed for beach park parking by the Pōka'ī Bay Beach Park Master Plan (Kim & Shiroma, 1999). Based on the site plan (Sheet A-1), all of lot 041 and portions of lots 040 and 044 amounting to approximately 0.04 acres (approximately 16,600 square feet) will be turned over to HPD.

The expanded parking area will be accessed from the existing Mākaha side entry on Farrington Highway and a two-way driveway on Pōka'ī Bay Street. The driveway will be set back 8-feet in anticipation of future road widening of Pōka'ī Bay Street. A one-way emergency exit from the parking area to Bayview Street is proposed. Both driveways will be controlled by swing gates activated by swipe card readers or underground vehicle detectors for automatic gate opening.

Visitor parking will be located on the 'Ewa end of the Station as is now provided. The existing 24-foot wide, two-way driveway from Farrington Highway will not be altered. Eight parking stalls (6 regular and 2 accessible with access aisle) will be provided. Visitors will be able to access the public lobby directly from the visitor parking lot. An existing service drive behind the Substation will be removed under the new parking and access proposal.

All parking areas and vehicle entries will be illuminated and provided with pole mounted cameras for remote surveillance and security.

3. Infrastructure

A new 2-inch water service lateral from Farrington Highway, 1½ water meter, and Board of Water Supply approved 2-inch backflow preventer will be installed.

A new 4-inch sewer lateral will connect the Station with a municipal sewer main in Bayview Street.

The site will be graded to direct surface runoff towards the rear of the property into grassed detention swales. Water will be allowed to evaporate or percolate into the ground and the grass should trap pollutants and sediments.

A three-phase, 120/208 volt electrical system will provide power for the Station and radio communication facility. In lieu of upgrading the existing electrical system, new electrical service will be provided.

A 15 kW line intensive system is being considered. The system will consist of rigid photovoltaic (PV) panels mounted on the south facing roof. The system will generate an estimated 1600 kWh per month.

A 250 KV standby generator will provide power to sustain police operations and the radio communications facility during a power outage. The generator will be located on the roof and concealed from public view.

4. Radio Communications Facility

The City and County of Honolulu Department of Information Technology radio communications facility will be relocated to the 2nd floor of the Station. The radio facilities will include a radio equipment room with secured access and segregated from police operations and an approximately 40'-0" tall self-supporting tower located on the roof. The

tower will be designed to allow for a 20-foot extension making the total height above the roofline 60 feet. A rooftop location will physically remove the facility from the tsunami evacuation and flood hazard zones at ground level.

Microwwave and whip antennas for the Department of Information Technology, HPD, and other system users (the Honolulu Fire Department for example) will be mounted on the tower.

Communication components will be designed to be hurricane resistant and to withstand wind speeds of 150 miles per hour.

The height of the self-supporting communications tower will exceed the building height limit of 25 feet for the R-5 zoning district. It is vital that the microwave antennas have unobstructed "shots" to a reflector antenna at a Board of Water Supply reservoir site on Pu'u Pāhe'ehe'e. From the reservoir, signals are transmitted to Puu Manawahua. The Department of Design and Construction will apply for a waiver to allow the tower to exceed the zoning district height limit.

5. Fuel Dispensing Station

The existing on-site fuel dispensing station will be upgraded to accommodate an increase in patrol vehicles. As proposed, one 6,000 gallon underground gasoline tank with a single dispenser will be installed for fueling patrol vehicles and one 1,000 gallon above ground diesel tank will fuel the emergency generator. The existing fuel dispensing station will be demolished and underground storage tanks removed. The new fuel dispensing station and fuel tanks will be located on the north side of the lot between the Station and the expanded parking area.

6. Landscaping

The proposed landscape design will create an aesthetically pleasing, quality environment to enhance the facility's profile within the community. Native Hawaiian and Polynesian plant materials will be selected based on their cultural significance, drought resistance, salt tolerance, and ease of maintenance (See Sheet L-1).

The parking area will be landscaped per requirements of the Land Use Ordinance, City and County of Honolulu. A permanent underground irrigation system will be installed in all landscaped areas.

7. Other Features

Under a 2006 City ordinance, all new City facilities larger than 5,000 square feet are required to meet Leadership in Energy and Environmental Design ("LEED") standards for a silver certification from the U.S. Green Building Council.

The design of the new Station has not been completed but will incorporate "green" elements into its design including but not limited to:

- High efficiency mechanical system
- Material of high recycled content
- Water efficient plumbing systems.

- On-site renewable energy (photovoltaic panels)

Perimeter fencing and entry gate design alternatives will be evaluated during the design development stage.

C. Economic Characteristics

The cost of the Phase I improvements is estimated at $15 million and will be funded by the City and County of Honolulu.

A two phase construction schedule is proposed. The major construction components of Phase 1 construction include demolishing the existing station and parking lots, building a two-story, 23,500 gross square foot building in its place, replacing and expanding the existing police vehicle parking lot, and replacing the City's existing radio communications facility. Construction is projected to start up in October 2011 with completed anticipated by April 2013.

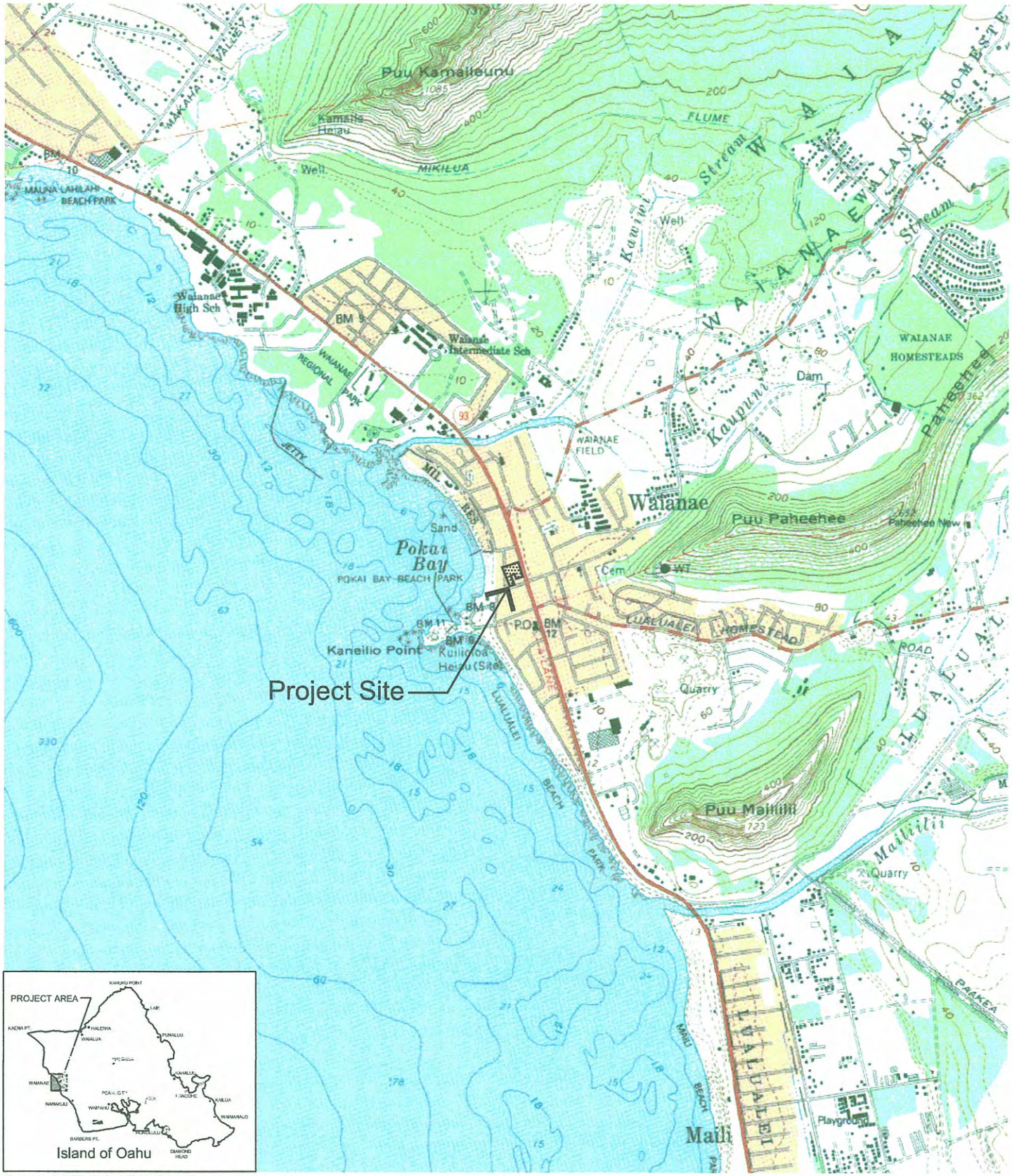
Phase 2 construction will build out approximately 5,200 square feet of loft space. Phase 2 is projected to start 2-5 years following completion and occupancy of the Phase 1 building.

The existing Substation building is located on parcel 051 which is owned by the State of Hawaii. It was transferred to the City and County of Honolulu by Executive Order No. 1910 in 1960 for "Courthouse and Police Station" purposes. All other parcels are owned by the City and County of Honolulu.

D. Social Characteristics

The proposed action will not displace any residence or business establishment on adjoining lots. During construction, police functions will continue from the District 8 Station in the second city of Kapolei, about 11.5 miles to the southeast. Police Officers will continue to regularly patrol community "beats" along the Leeward Coast.

Accessible walkways, parking, and public areas will be designed in compliance with rules, regulations, and accessibility standards pursuant to the Americans with Disabilities Act ("ADA").



Source: USGS, Waianae Quadrangle

Gerald Park
Urban Planner
September 2009

LINEAL SCALE (FEET)
1000 500 0 500 1000 2000

NORTH

Figure 1
Location Map
Wai'anae Police Station Replacement

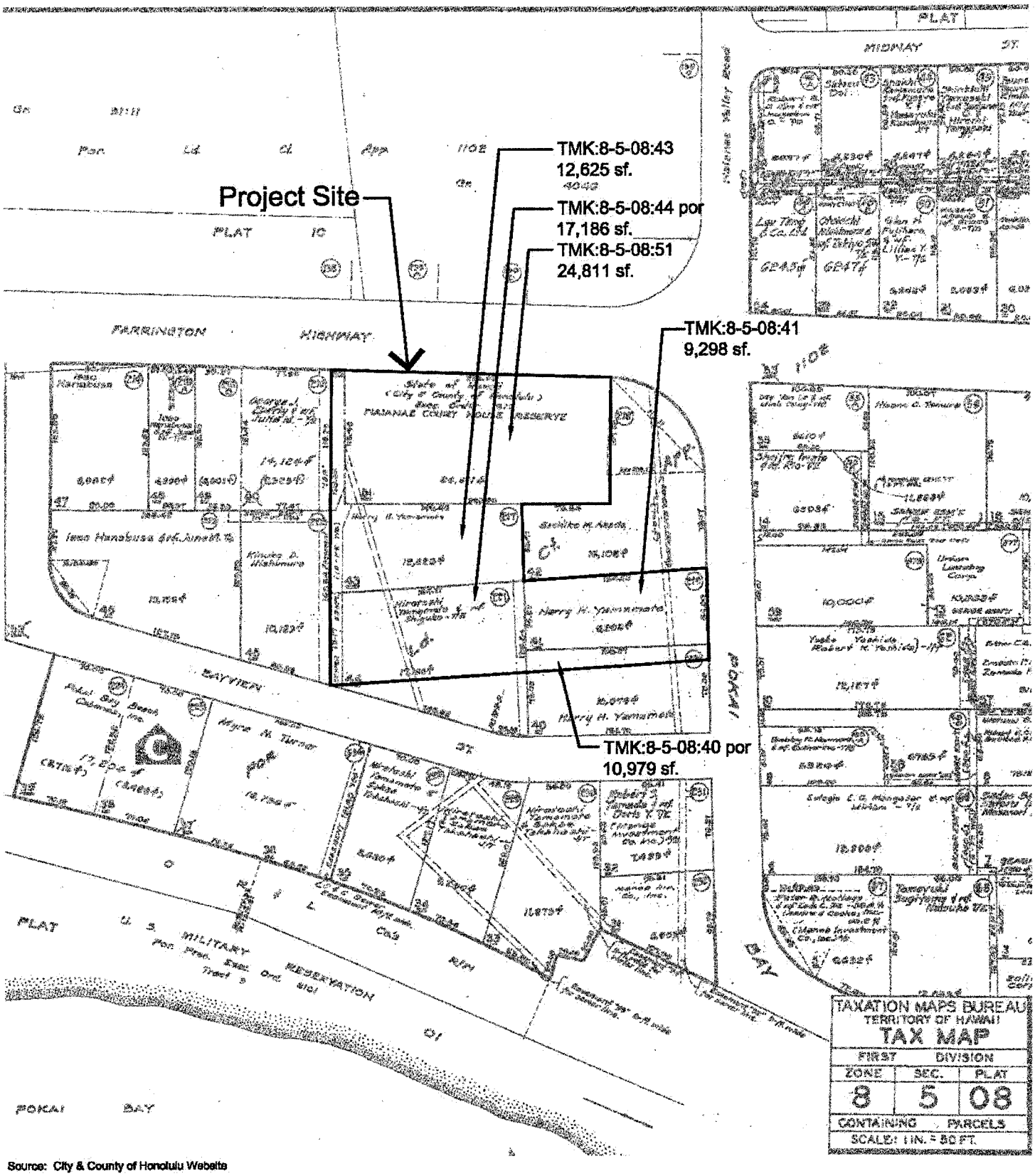
Source: USGS, National Map Viewer

Gerald Park
Urban Planner
September 2009

LINEAL SCALE (FEET)
200 100 0 100 200 400

NORTH

Figure 2
Vicinity Map
Wai'anae Police Station Replacement



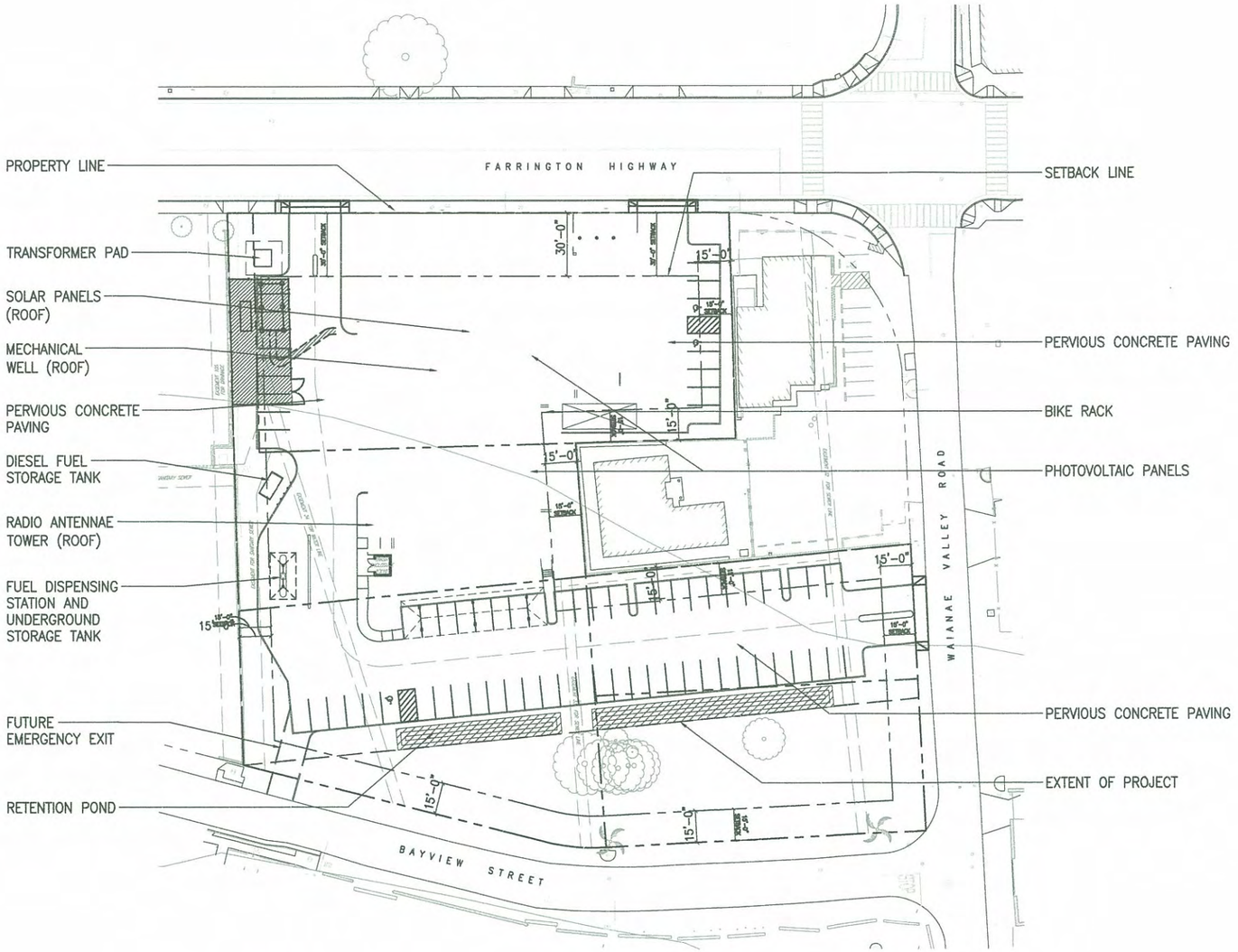
Source: City & County of Honolulu Website

LINEAL SCALE (FEET)
50 25 0 25 50 100

NORTH

Gerald Park
Urban Planner
September 2009

Figure 3
Tax Map
Wai'anae Police Station Replacement



A OVERALL SITE PLAN
SCALE: 0' 15' 30' 60' 120'

N

A-1

SCHEMATIC DESIGN SUBMITTAL
OCTOBER 2009

HONOLULU POLICE

WAIANAE POLICE STATION REPLACEMENT

WAIANAE, OAHU, HAWAII

INTEGRUS ARCHITECTURE

ARCHITECTS-HAWAII LIMITED

PUBLIC

ADMINISTRATION

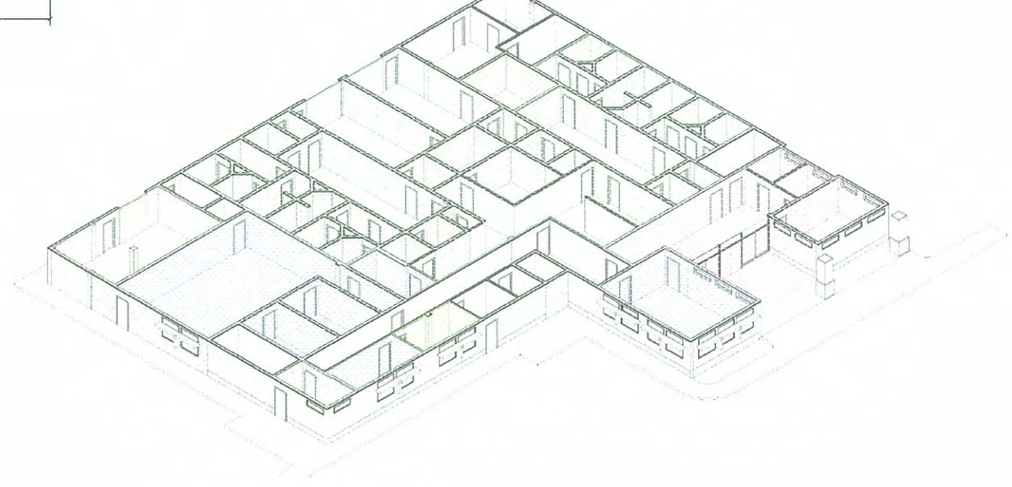
RECEIVING/BOOKING/HOLDING

PATROL

AUXILIARY

INVESTIGATION

(1.402) ROOM NUMBER REFERENCE TO FLOOR AREA MATRIX



A GROUND FLOOR PLAN

SCALE: 0' 2' 4' 8' 16' 32'

A-2

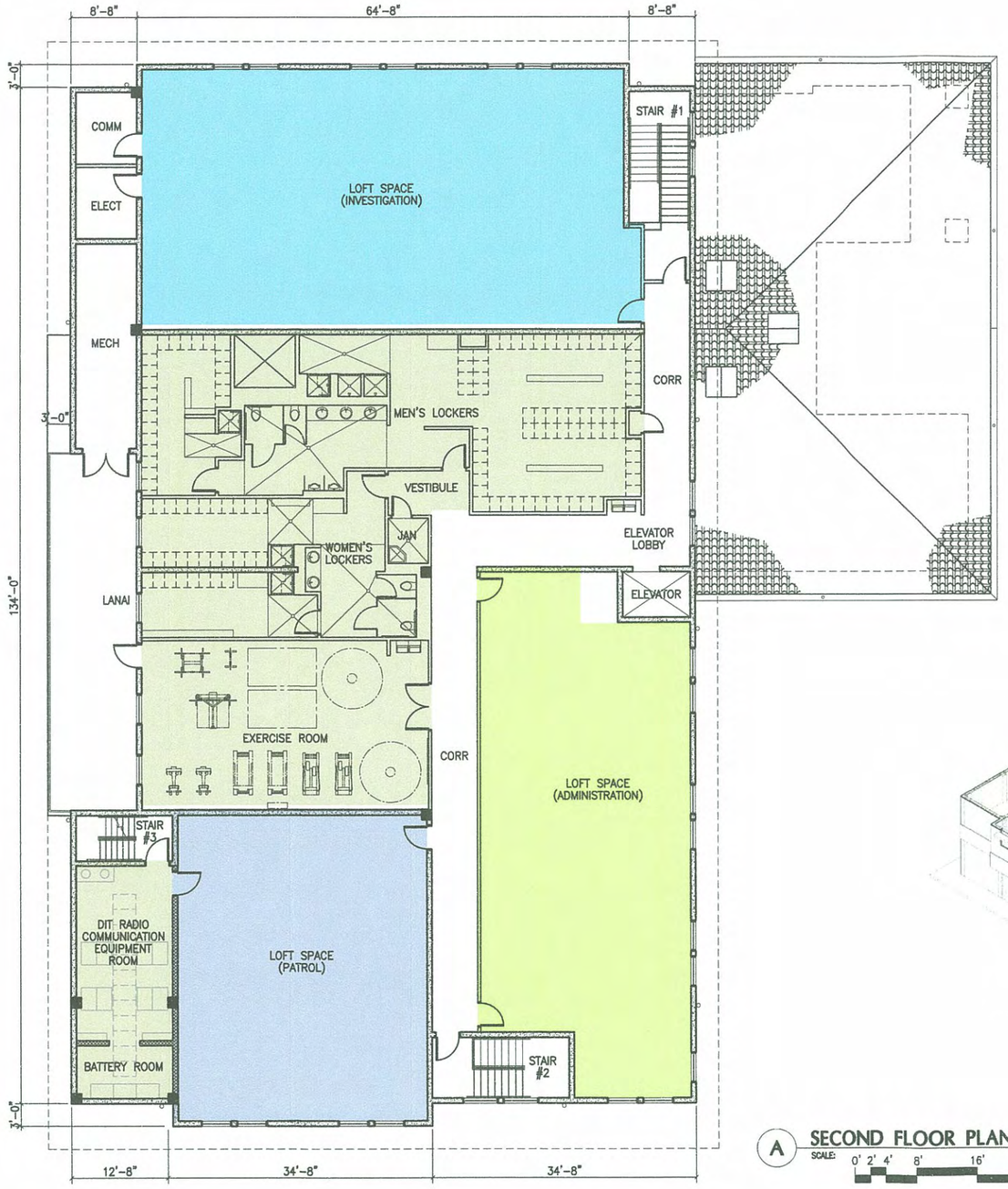
SCHEMATIC DESIGN SUBMITTAL
OCTOBER 2009

WAIANAE POLICE STATION REPLACEMENT

WAIANAE, OAHU, HAWAII

INTĒGRUS ARCHITECTURE

ARCHITECTS·HAWAII LIMITED



PUBLIC

ADMINISTRATION

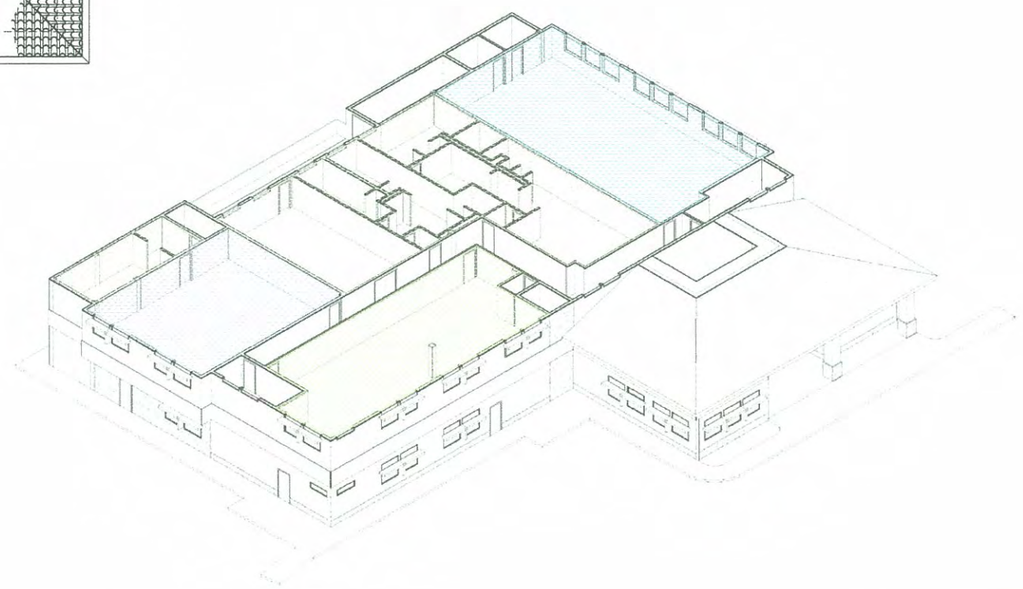
RECEIVING/BOOKING/HOLDING

PATROL

AUXILIARY

INVESTIGATION

(1.402) ROOM NUMBER REFERENCE TO FLOOR AREA MATRIX



A SECOND FLOOR PLAN

SCALE: 0' 2' 4' 8' 16' 32'

A-3

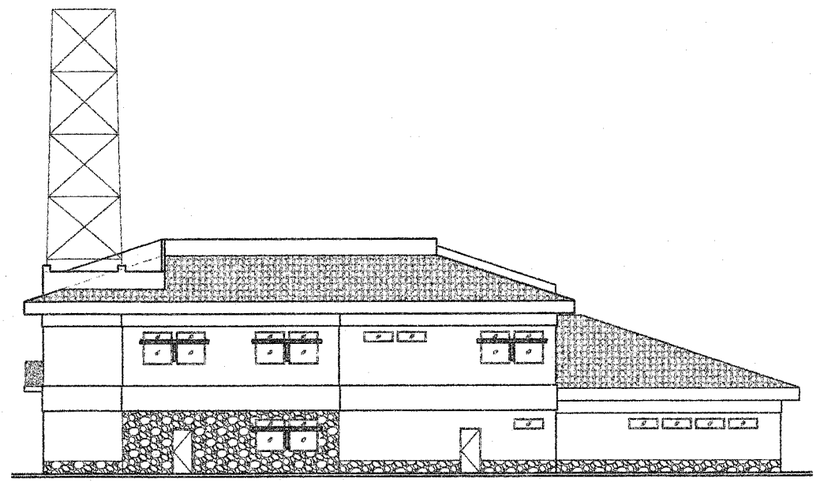
SCHEMATIC DESIGN SUBMITTAL
OCTOBER 2009

WAIANAE POLICE STATION REPLACEMENT

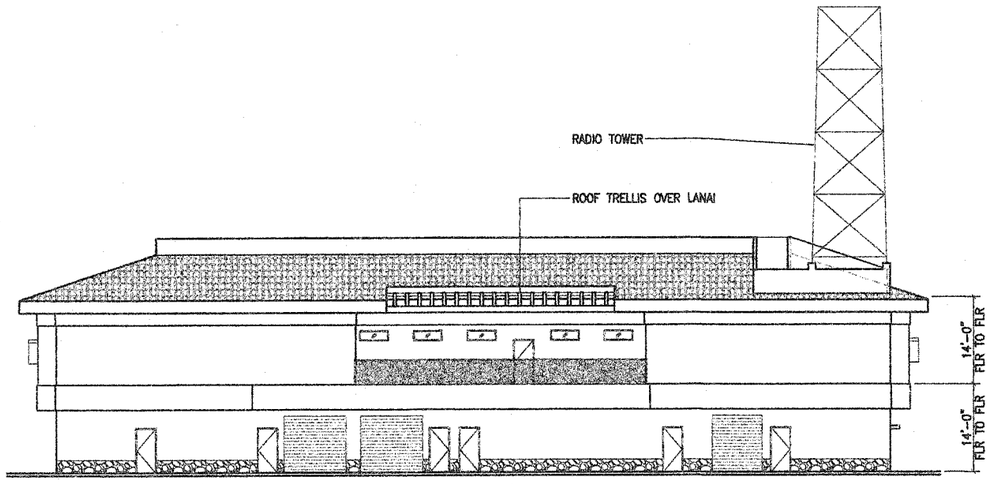
WAIANAE, OAHU, HAWAII

INTEGRUS ARCHITECTURE

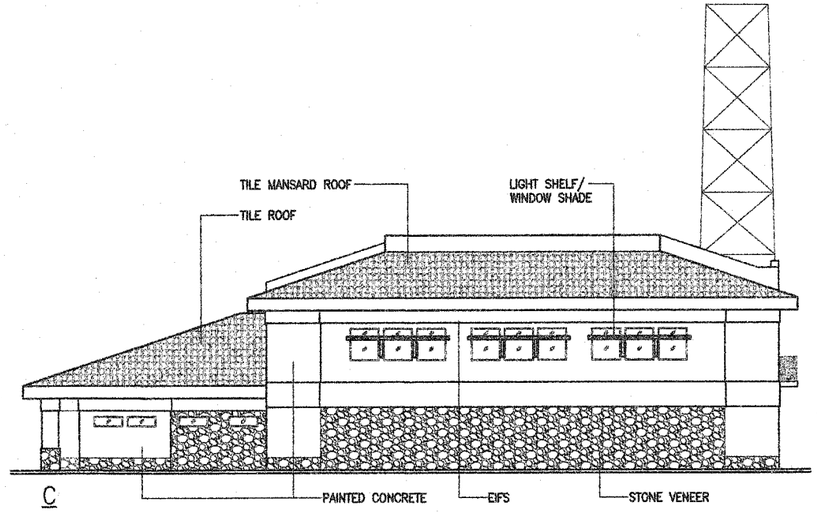
ARCHITECTS-HAWAII LIMITED



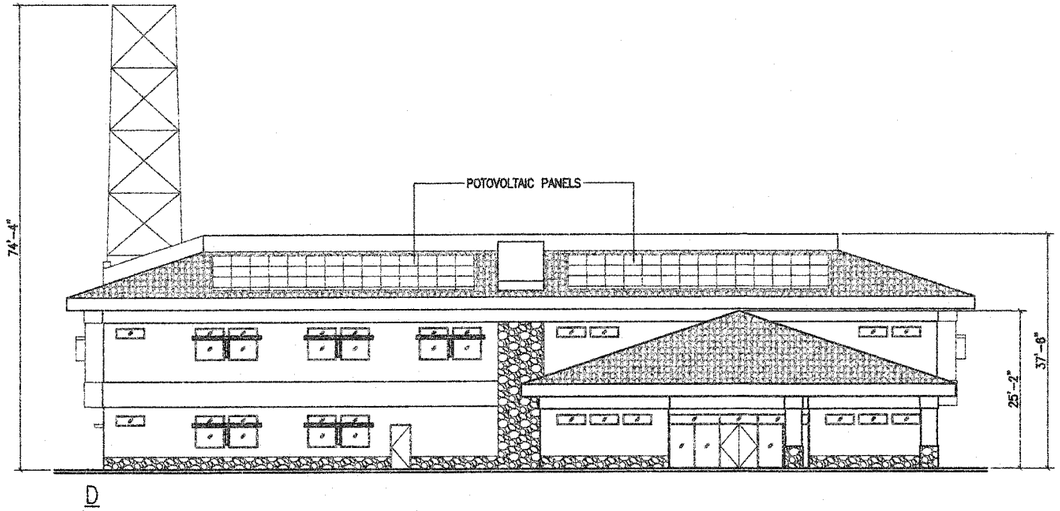
A



B



C



D

A EXTERIOR ELEVATIONS

SCALE: 0' 4' 8' 16' 32'

A-5

SCHEMATIC DESIGN SUBMITTAL
OCTOBER 2009

WAIANAE POLICE STATION REPLACEMENT

WAIANAE, OAHU, HAWAII

INTEGRUS ARCHITECTURE

ARCHITECTS HAWAII LIMITED

Note:
AUTOMATIC IRRIGATION SYSTEM TO BE PROVIDED.

L-1

SCHEMATIC DESIGN SUBMITTAL
OCTOBER 2009

WAIANAE POLICE STATION REPLACEMENT

WAIANAE, OAHU, HAWAII

INTĒGRUS ARCHITECTURE

ARCHITECTS·HAWAII LIMITED

SECTION 2
DESCRIPTION OF THE AFFECTED ENVIRONMENT

A. Existing Conditions

The existing Wai'anae Substation is a 7,000 square foot, single-story building. The Substation was constructed sometime in the early 1960s as both a police station and courthouse. Although court functions ceased in 1992 when the courtroom was eliminated and converted in a police squad room, the building continued to function as a police station. With construction of the Kapolei District Station in the year 2000, police functions were transferred to Kapolei but HPD has maintained its presence in the community.

HPD operates three watches per day originating from the Kapolei District Station. Thirteen officers on each watch patrol seven (7) beats between Kapolei on the south and Ka'ena Point on the north. At the present time, HPD assigns one desk sergeant to the Substation for each watch. Police officers and investigators use rooms at the Substation to conduct follow up investigations, interviews, and as a place to fill out police reports. There are no administrative and clerical personnel assigned to the Substation.

The Substation is accessed from two driveways one on either end of the building. Police vehicles access the parking area from the Mākaha side and public parking is provided on the Ewa side. Both driveways provide in/out travel and left turns in from Farrington Highway. The two driveways are connected on-site by a service driveway at the rear of the Substation.

A detached auxiliary shed housing a gas fuel pump, emergency generator, two covered parking stalls, and storage are located behind the Substation. The fueling facility consists of a 10,800 gallon above ground gasoline storage tank, pump, and fuel dispenser. An underground storage tank is located beneath the driveway adjoining the auxiliary shed.

Vehicle maintenance or service functions are not conducted on the property. All police vehicles are maintained and serviced at the Police Training Academy in Waipahu

A three-sided, self-supporting tower is sited in the northwest corner of the Substation building. The 42-foot high tower is secured by a 6-foot high chain link fence. Antennas mounted on the tower include two 6-foot microwave antennas, three small mast antennas, a 12-foot mast antenna, and two yagi antennas.

A utility pole with three mast antennas adjoins the auxiliary building on its 'Ewa side. The pole is approximately the same height as the self-supporting tower.

In 1997, a Conditional Use Permit (97/CUP1-7) was approved between the Department of Parks and Recreation and HPD for joint development of two adjacent lots (Lots 051 and 043). Joint development was required to implement expansion of off-street parking at the Wai'anae Police Station. The additional parking area was needed to accommodate police vehicles and for storing evidence vehicles during investigations. In addition, a secured, covered storage shed was constructed on the southern end of the parking area to be used for evidence storage. The parking area is enclosed by chain link fencing, lighted, and landscaped.

The present parking arrangement provides 39 off-street parking stalls..

The area of the proposed parking area expansion consists of three vacant lots. The terrain is relatively level and shaded by assorted trees. Broken chunks of concrete, asphalt concrete, plumbing waste pipes, rubbish piles, and fallen tree trunks dot the landscape. In 1989, the City acquired several residential lots on both sides of the southern end of Bayview Street for expansion of Pōka'ī Bay Beach Park. One of the acquired lots *makai* of Bayview Street may have been the Pōka'ī Bay Tavern (Hammatt et.al, 1999).

Some of the facilities described above are shown in the Site Photographs.

B. Climate

The climate of Wai'anae can be characterized as hot and dry. Annual rainfall averages less than 25 inches along the coastline to 80-100 inches at the higher elevations of the Wai'anae Mountains. Daily temperatures range between 72° and 80° Fahrenheit and can reach the low to mid-90's during the summer. Prevailing winds blow from the northeast direction at an average 10-13 miles per hour (Park, Gerald Urban Planner, 2000).

C. Geology and Soils

Soil Conservation Soil Maps (1972) identify site soils as Pulehu clay loam, 0 to 3 percent slopes (Soil Legend: PsA). This soil is moderately permeable, runoff is slow, and the erosion hazard is slight. Archaeological investigations indicated that the soil layer is underlain by limestone bedrock at depths ranging from 25 to 75 centimeters (Hammatt et.al, 1999).

D. Topography

The site has been extensively modified by construction of the existing improvements. Ground elevation falls from a high of +11 feet above sea level at Farrington Highway to elevation +8 feet at Bayview Street. Although the site of the Substation and associated parking area has been improved, the area of the expanded parking area has not.

E. Flood Hazard and Drainage

The Flood Insurance Rate Map (shown in Figure 4) places parcel 051 (the site of the existing police station) in Flood Hazard Zone "D" which is defined as "areas of undetermined, but possible, flood hazards (Federal Emergency Management Agency, 2004)".

Parcel 043, located behind the station and used for parking, is designated Zone AE 8' and the future parking area Zone AE 10'. The "AE" designation identifies "special flood hazard areas subject to inundation by the 1% annual chance flood." The 1% annual flood chance flood (or the 100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The numeral following the AE is the water-surface elevation of the 1% annual chance flood or the base flood elevation above sea level.

Photograph 1. Antenna Site and Auxiliary Shed at Rear of Station.

Photograph 2. Mākaha Side Entry and Parking Area.

Photograph 3. Secured Storage Shed. Note 2-story Dwelling Behind the Shed.

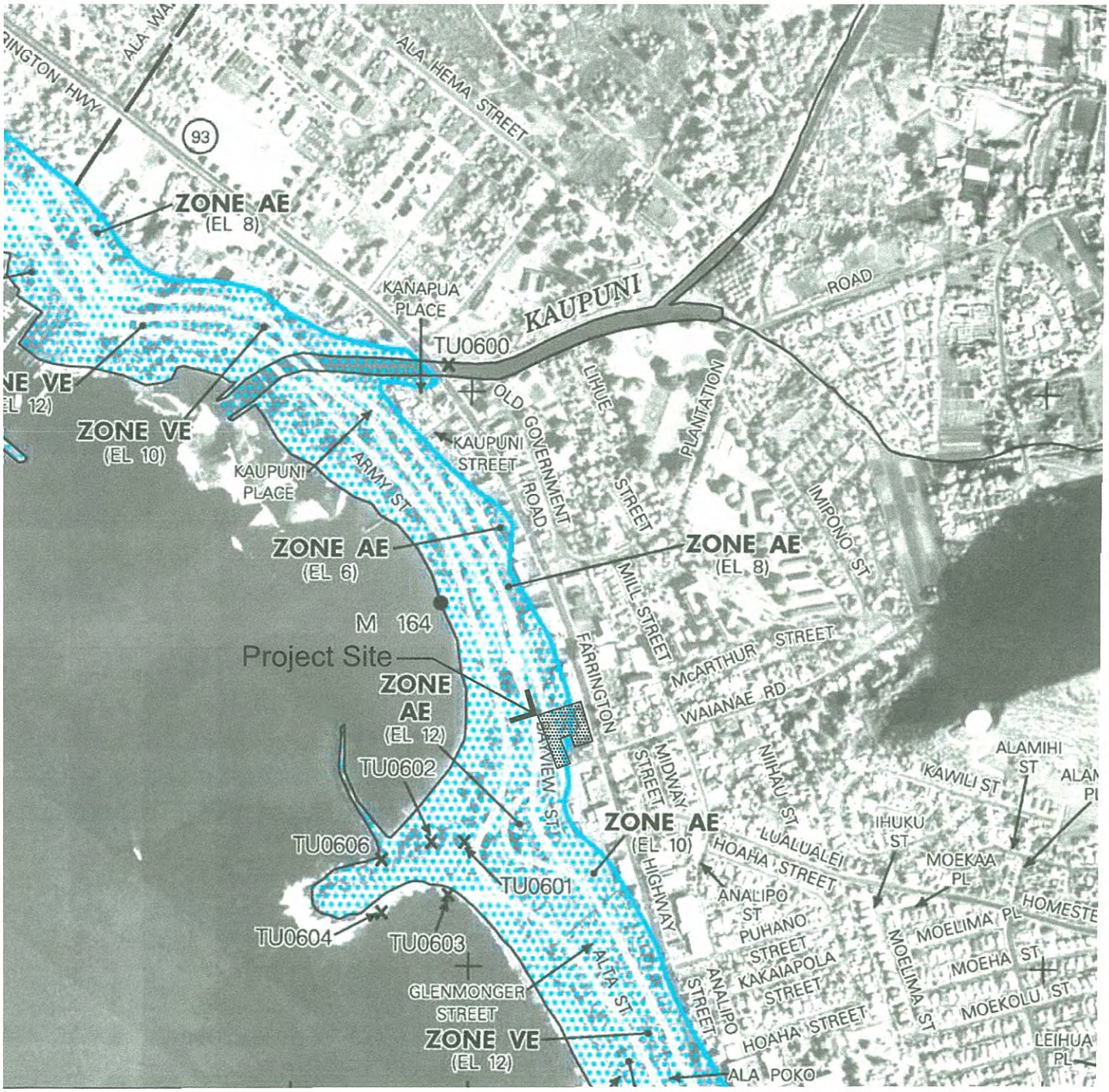
Photograph 4. Expansion Area Looking South from Property on the North.

Photograph 5. Expansion Area Looking North from Pōka'ī Bay Street.

Aerial: USGS National Map Viewer
Photographs: Gerald Park

Photo Key Map

GRAPHIC SCALE IN FEET
100 50 0 100 200



Legend

- Special Flood Hazard Zone Subject to Inundated by the 1% Annual Chance Flood
  - Zone A — No Base Flood Elevation Determined.
  - Zone AE — Base Flood Elevation Determined.
  - Zone VE — Coastal Flood Zone with Velocity Hazard (Wave Action); Base Flood Elevations Determined.
- Zone X — Areas of 0.2% Annual Chance Flood with Average Depths of Less than 1 foot or with Drainage Areas less than 1 Square Mile.
- Zone X — Areas Determined to be Outside the 0.2% Annual Chance Floodplain.

Source: Federal Emergency Management Agency
Flood Insurance Rate Map
Map Number 15003C0185F
Date: Sept. 30, 2004.

LINEAL SCALE (FEET)
400 200 0 200 400 800

NORTH

Gerald Park
Urban Planner
September 2009

Figure 4
FIRM Map
Wai'anae Police Station Replacement

Parcels 040, 041, and 044 which are to be used for vehicle parking are located in a coastal high hazard zone. The Flood Insurance Rate Map shows a VE 12" designation over both lots meaning that they are within a "coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined." The base flood elevation is 12 feet above mean sea level.

There are no well-defined drainage channels on the improved and unimproved lots. The existing Substation and parking area are not prone to flooding from natural causes. HPD has indicated that the Substation building *per se* has not flooded but the parking lot can flood with heavy rain.

Localized flooding occurs between the police station and Pōka'ī i Bay Beach Park from storm water overflowing the storm drainage system (Department of Parks and Recreation, 1989). The City drainage system from Farrington Highway to Bayview Street and through Pōka'ī Bay Beach Park is inadequate to handle runoff storms with a recurrence interval of one year (Ibid). Runoff enters the drainage system from Farrington Highway and overflows from an inlet in the northern corner of the Park and from catch basins on Bayview Street. Water collects on Bayview Street and the vacant lots until it drains, evaporates, or percolates into the ground.

F. Water Resources

1. Groundwater

According to groundwater maps prepared by Mink and Lau (1990), the lots overlie the Wai'anae aquifer of the Wai'anae aquifer sector (See Table 1).

Table 2. Aquifer Classification System

Aquifer Code	**30303116**	**30303122**
Island Code	3 - Oahu	3 - Oahu
Aquifer Sector	03 - Waianae	03 - Waianae
Aquifer system	03 - Waianae	03 - Waianae
Aquifer Type, hydrogeology	1 - Basal	1 - Basal
Aquifer Condition	1 - Unconfined	2 - Confined
Aquifer Type, geology	1 - Sedimentary	2 - Dike
Status Code	**13311**	**23223**
Developmental Stage	1 - Currently Used	2 - Potential Use
Utility	3 - Neither	3 - Neither
Salinity (in mg/L Cl^-)	3 - Moderate (1,000-5,000)	2 - Low (250-1,000)
Uniqueness	1 - Irreplaceable	2 - Replaceable
Vulnerability to Contamination	1 - High	3 - Low

Source: Mink and Lau, 1990.

The Wai'anae aquifer is characterized by an unconfined sedimentary aquifer above a confined dike aquifer. The sedimentary aquifer is comprised of moderately brackish water, is currently being used (but not for drinking water), and is highly vulnerable to contamination. The dike-confined aquifer also is not used for drinking water, is low in salinity, and has a low vulnerability to contamination.

In the absence of soil borings, the depth to groundwater cannot be determined at this time.

2. Surface Water

There are no streams, rivers, ponds, wetlands or other surface water bodies on any of the lots. Pōka'ī Bay and the Pacific Ocean are approximately 400 feet to the west of the proposed parking area.

G. Biological Resources

The two lots used by the Police Department support a sparse array of flora all of which were planted as part of the landscaping for the Substation and parking lot. Fern trees along Farrington Highway provide shade while screening sections of the building from passing traffic. Plumeria trees are planted at the two vehicle entrances and in the parking lot. Areas that may have supported grass have been taken over by weedy specimens and shrubs are non-existent save for individual beach naupaka, ti, and ginger. The paucity of landscaping is probably due to the utilitarian type of building, predominance of paved surfaces, and limited planting areas. The existing irrigation system appears to be unused.

The three vacant lots have been significantly altered by man. The ground has been cleared but mature trees including kiawe, monkey pod, opiuma, and mango still remain. Several coconut palms and a single Norfolk Island pine also occur. The spreading canopies preclude extensive vegetation growth on the ground except for wayside weeds.

Wildlife was not observed although barking dogs and chirping birds were heard. More than likely feral cat, mongoose, and rodents forage for food and water in the area.

H. Archaeological Resources

In December 1990, Cultural Surveys Hawaii conducted a subsurface archaeological survey for the proposed expansion of Pōka'ī Bay Beach Park. The survey included subsurface testing on parcels 043 (the existing Police Station parking lot) and lots 040, 041, and 044 all of which had been recently acquired by the City and County of Honolulu. The consulting archaeologists referred to this as Sub-area 1. A general summary of the test results for Sub-area 1 is as follows:

> "Sub-area 1 is the eastern (*mauka*) most portion of the project area and was formerly a residential lot(s). The surface within Sub-area 1 is compacted and level but quite overgrown with grass and a few trees, including a *kiawe* thicket. There was a total of six test units excavated within this area. No prehistoric or early historic cultural layer was present within any of the test units. In general, these excavations revealed historic/modern disturbance down to the underlying limestone bedrock."

The archaeological survey report was accepted by the State Historic Preservation Division as a final report in December 1999.

I. Cultural Resources

Cultural Resources Hawaii (2009) prepared a cultural impact assessment for the proposed project. The discussion of specific aspects of traditional Hawaiian culture as they may relate to the project area is excerpted below. Cultural resources and practices identified within or

in proximity to the subject project area are presented in the broader context of the larger Wai'anae Ahupua'a. The cultural impact assessment is included in this environmental assessment as Appendix A.

Growing and Gathering of Plant Resources

Wai'anae in the 1790s was the center of habitation for the Leeward coast. The valley was well watered and the ocean hosted an abundant supply of fish, the lowlands produced *'uala* (sweet potato) and *niu* (coconut), and the inland valley boasted *kalo* (taro) and *wauke* (for making tapa). The upland forest regions sustained various trees whose wood could be worked into weapons and canoes.

By the late 1800s most of upper Wai'anae had become grazing and lease lands. Even today there remain extensive field systems of *lo'i* terraces on the upland slopes. House sites and old kula field walls remain for the most part intact in the *mauka* boundaries of Wai'anae Ranch.

Invasive species like the kiawe and koa haole are plentiful along the lower slopes of the valley, and the lowland area just *mauk*a of the project has sand dunes.

Although industry and the built environment quickly reduced the cultivated landscape, plants and herbs collect y gathering still grew and grow in many areas. Several of the community informants mentioned the plants they would gather: *ki heihei* was used for tea; *lau kahi* and *lau ki* was used for sores and for diabetes; *pōpolo* was used for cancer, for infant congestion and as a glue; *'uhaloa* was used for the tonsils; and *noni* was for arthritis

Marine and Freshwater Resources

Wai'anae Valley was and is the most well-watered valley on the west side of O'ahu, on of the few with annual and perennial flowing streams and numerous springs such as Olahua Stream, Kiko'o Strem and Kumaipo Stream, along with Punana'ula and Kaupuni Streams. The uplands of Wai'anae were watered with over 30 springs or seeps.

Puehu Fishpond is the only named pond we could find reference to in the project area identified by Sterling and Summers. Unlike the ponds around Nene'u village, Puehu was not affected by the tides. By 1954, Loko Puehu was "almost completely filled in."

On the shores of Pōka'ī could be found *limu kohu*, *limu wāwae'iole*, *pipipi*, sharp quilled *wana*, puka shell, corals, and cowry. The community members said you could catch *halalū*, *akule, moi, awa, he'e, manini* and a lot of *nehu* by throwing net off the rockes or spearing around Pōka'ī. Much of the same marine resources are found in Pokai today albeit greatly depleted.

Cultural and Historic Properties

Ten *heiau* (six of which had beed recorded as destroyed), the Puehu fishpond, the Kawiwi fortress, and several house sites. An adze quarry was located on the eastern ridge of the upper valley (Paheehee Ridge). Many of the basalt flakes and stone tools for farming and cultivating in the Wai'anae Ahupua'a would have been produced or cored there.

Just mauka of the project area and Kāneʻīlio Point is Pāheʻeheʻe Ridge. Just inside the lower point of Pāheʻeheʻe is Puʻu Pāheʻeheʻe Heiau, which still stands today. The heiau is below a Board of Water Supply water tank and remnants of an old *hōlua* slide are on the *makai* face of Pāheʻeheʻe.

All the community members interviewd referred to the presence and importance of the *heiau* at Kāneʻīlio Point, Kūʻīlioloa Heiau being situated prominently at the most makai end of this jutting landmass. The abundance of heiau recorded within Waiʻanae Ahupuaʻa is evidence of its fertility for cultivation and its religious and political centrality within the district, as well as its association with the *aliʻi*.

Trails

Waiʻanae and Mākaha Uka are connected by a trail that was used in ancient days near the *mauka* end of Kawiwi Ridge, a fortress that looked down on Kamaile sitting at the apex of the trail. It is unconfirmed if Kawiwi fortress still remains today.

The Kumaipo Trail from Mākaha over Kawiwi into Waiʻanae might have connected with a long cliff road; Elou, from Kalena and Haleʻauʻau, on the east side of Kaʻala, coming down to Waiʻanae. The Kumaipo Trail passes Kumaipo Heiau, which is still standing. Fred Cachola, a community informant, has visited the *heiau* in the last decade.

Burials

A subsurface study (Borthwick et.al., 1999) for the Pōkaʻi Bay Beach Park Expansion and Improvements Project yielded no cultural or historic finds in the project area (the area proposed for the expanded parking lot).

Archaeological reports prepared for locations in the vicinity of the project area have encountered burial sites. In the Waiʻanae Army Recreation Center, thirty-two sets of *iwi kūpuna* have been discovered in a ten-year span. .

At least five sets of *iwi kūpuna* have been discovered for other projects along Farrington Highway. A community informant mentioned that a cemetery once stood where the McDonalds and KFC are located.

Wahi Pana (Storied Places)

Hawaiian traditions centered on Waiʻanae expand upon the area's significance and association with the aliʻi in pre-Contact times. The district is a focus in mythological cycles of Maui, Kamapuaʻa, and Kamohoaliʻi. One story is recounted as follows:

Ku-ʻilio-loa was the name of a legendary dog who was originally known in ancient times as a protector of travelers. Later on, the bad qualities of another dog were transferred to this dog so that he became known as evil which was not true (Pukui, 1954).

The pig demi-god, Kamapuaʻa battled with the giant man-dog Kū-ʻīlio-loa (after whom the heiau in Waiʻanae is named) and raised the taro patches of Waiʻanae Valley. The people caught him, tied him up, and were preparing to sacrifice him when his many supernatural bodies swept over the plains, devouring the men of Waiʻanae and sending them fleeing in terror (Fornander, 1919).

J. Land Use Controls

Land use controls for the property are as follows:

State Land Use District:	Urban
General Plan	Rural
Wai'anae *Sustainable* Communities Plan:	Rural Residential
Zoning:	R-5 Residential (See Figure 5)
Public Infrastructure Map:	No Police Station Modification Symbol
Special Management Area:	Inside Special Management Area
Special District:	None

The proposed Wai'anae Police Station defined as a public use and structure. Public uses and structures are permitted in the R-5 zoning district.

A "symbol" for the proposed Police Station is not shown on the Wai'anae Public Infrastructure Map ("PIM"). A police station modification "symbol" (PS/M) will have to be added to the PIM for future construction of $3 million or more. Therefore, an application will be submitted to the Department of Planning and Permitting to amend the PIM to place a "PS/M" symbol on the existing site prior to requesting construction funds for future improvements.

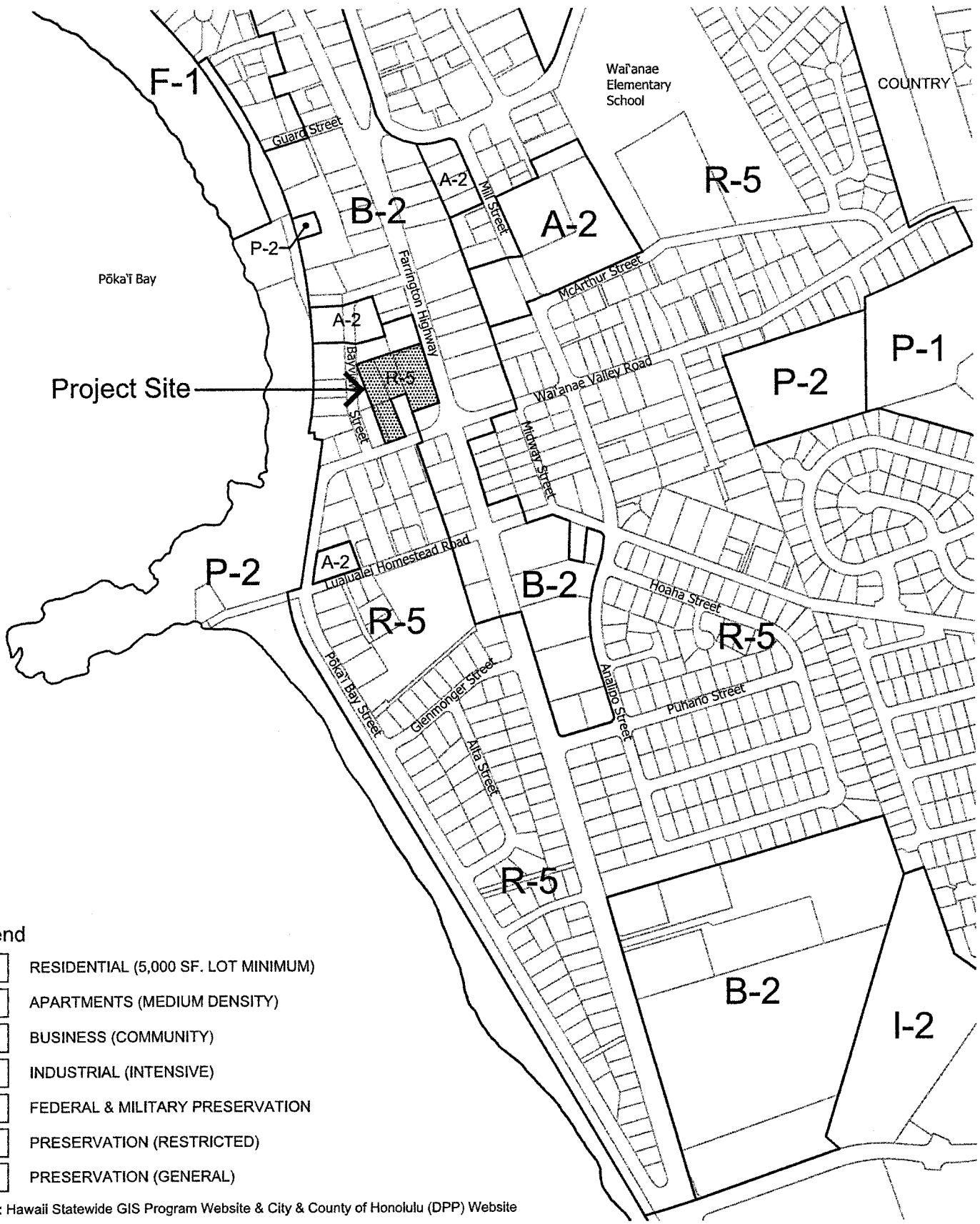
The project is located within the County delineated Special Management Area (Figure 6) and a Special Management Area permit will be required prior to construction.

K. Views

The Coastal View Study (Chu and Jones, 1987) surveyed coastal views and landforms for the island of O'ahu. The Study inventoried coastal areas by viewshed and rated them from Type 1 to Type 6 (Type 1 offering significant coastal views and Type 6 as coastal views linked to large development proposals such as West Beach, Ewa Marina, and Kuilima). The Wai'anae Police Station is within the Pōka'ī Bay section of the Wai'anae Viewshed. The Wai'anae Viewshed was classified as a Type 3 Viewshed. Type 3 refers specifically to the Wai'anae and Nanakuli viewsheds where coastal views and the design of the coastal Highway frontage including buildings and landscaping are the key components to visual resources management of the area.

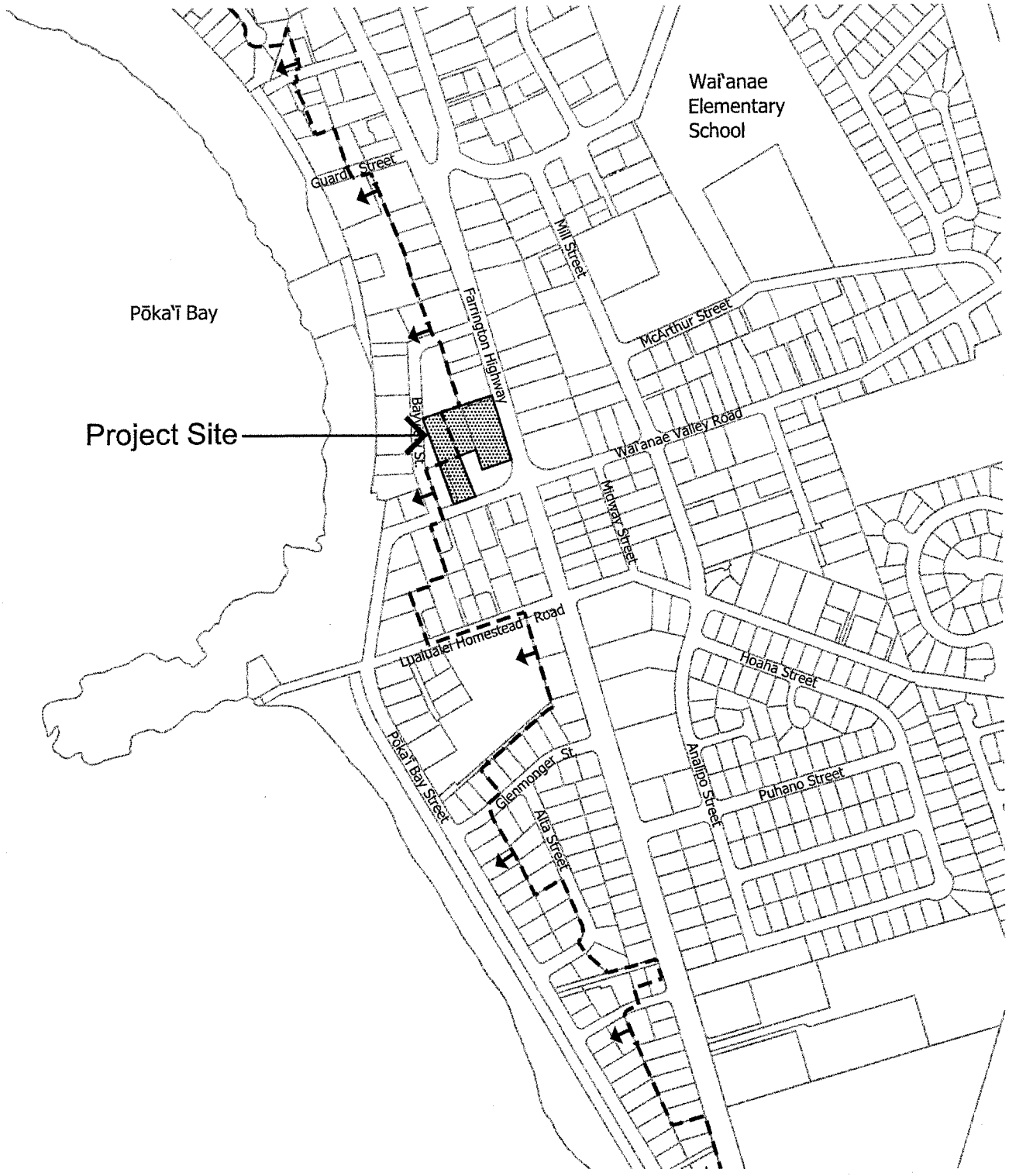
Pōka'ī Bay Road [Street] in the vicinity of the Police Station is identified as the "beginning of a continuous view which extent[d]s into the Maili section. Coastal views are across Lualualei Beach Park and Pōka'ī Beach Park. Other than the length of this view opening, there is nothing visually distinctive about this roadway view. "

Mauka of Farrington Highway, Puu Paheehee and Puu Mailiili are identified as an important coastal land form. Coastal land form such as "Puu Paheehee, Puu o Hulu Kai, Mauna Lahilahi and several descending ridges are vivid landmarks and the primary view attributes of this section of the viewshed (Ibid)."



Gerald Park
Urban Planner
September 2009

Figure 5
Zoning
Wai'anae Police Station Replacement



Legend

SPECIAL MANAGEMENT AREA BOUNDARY

Source: Hawaii Statewide GIS Program Website & City & County of Honolulu (DPP) Website

Gerald Park
Urban Planner
September 2009

LINEAL SCALE (FEET)
250 125 0 125 250 500

NORTH

Figure 6
Special Management Area
Waiʻanae Police Station Replacement

Waiʻanae Kai, Waiʻanae, Oʻahu, Hawaiʻi

Department of Design & Construction, City & County of Honolulu

L. Public Facilities

1. Area Roadway System

Farrington Highway, a two-way, four-lane, all-weather surfaced roadway, passes the front of the Substation generally in a north-south direction. It is the main access route along the Waiʻanae Coast. The State-owned roadway is fully improved with curbs, gutters, and sidewalks. Traffic movement onto Farrington Highway from the visitor and police parking lot is STOP-sign controlled. The posted speed limit is 25 miles per hour.

The Station will be setback 12 feet from the property line in anticipation of a State Department of Transportation initiative for road widening.

A bus stop for southbound buses is located directly in front of the substation; a northbound bus stop is located across Farrington Highway.

Adjacent to the project site, Farrington Highway intersects Waiʻanae Valley Road (also identified by street sign as Pōkaʻī Bay Street *makai* of Farrington Highway). At this signalized intersection, the northbound and southbound approaches of the highway have shared through and left-turn lanes and shared through and right-turn lanes. Waiʻanae Valley Road is a two-lane, two-way roadway generally oriented in the east-west direction. At the intersection with Farrington Highway, the Waiʻanae Valley Road approach has one lane that serves all traffic movements.

Pōkaʻī Bay Street, a two-lane, two-way all weather surfaced roadway, lies within a 40-foot right–of-way. The road has shoulders on both sides but is without curbs, gutters, and sidewalks. The posted speed limit is 25 miles per hour. The road is proposed to be widened to 56 feet with land for the widening obtained from both sides of the street. In anticipation of the widening, the secondary entry to the parking lot from Pōkaʻī Bay Street is setback 8-feet.

North of Waiʻanae Valley Road, Farrington Highway intersects Bayview Street. Bayview Street, is a two-way, two-lane all weather surfaced road between Farrington Highway on the north and Pōkaʻī Bay Street on the south. At this unsignalized T-intersection, the northbound approach of Waiʻanae Valley Road (or Pōkaʻī Bay Street) has one through lane and one shared left-turn and through lane while the southbound approach has one through lane and one shared right-turn and through lane. The Bayview Street approach has one eastbound lane that serves left-turn and right-turn traffic movements.

West of the intersection with Farrington Highway, Waiʻanae Valley Road intersects Bayview Street. At this unsignalized T-intersection, the eastbound approach of Waiʻanae Valley Road has a shared left-turn and through lane while the westbound approach has a shared right-turn and through lane. The Bayview Street approach has one southbound lane that serves left-turn and right-turn traffic movements. The 40-foot right-of-way is improved with curbs, gutters, and sidewalks on its *makai* side only. The Pōkaʻī Bay Beach Park Master Plan proposed closing the southern half of the road and developing it for beach parking. The closed section would be converted into a cul-de-sac to provide access to a multi-family building and two residential dwellings along its alignment. The posted speed limit is 15 miles per hour.

Existing AM and PM peak hour traffic volumes and operating traffic conditions are shown in Figures 7 and 8, respectively. The AM peak hour of traffic generally occurs between 7:15 AM and 8:15 Am in the vicinity of the substation. The afternoon peak hour of traffic occurs between the hours of 3:00 PM and 4:00 PM.

2. Water

Potable water is supplied by the Board of Water Supply, City and County of Honolulu. A 20-inch water main runs under the *makai* side of Farrington Highway and a 16-inch main under the *mauka* side. In addition, there are 8-inch mains under Pōka'ī Bay Street and Bayview Street.

The Substation is serviced by a 1½" service lateral and a 1-inch domestic water meter. The lateral connects to the 16" transmission main in Farrington Highway.

Average daily consumption is estimated at less than 100 gallons per day.

Two fire hydrants are located on the *mauka* side of Farrington Highway, one on Bayview Street, and one on Pōka'ī Bay Street.

3. Sewer

This area of Wai'anae town is well sewered. Municipal sewer lines include a 42" main in Farrington Highway to Bayview Street, 8" and 16" mains under Bayview Street, and a 12" line in a 10-foot wide sewer easement on the north side of the station. A 6" lateral connects the police station to the 12" line in the sewer easement.

A second sewer easement between Farrington Highway and Pokai Bay Beach Park crosses under the proposed driveway from Pōka'ī Bay Street to the expanded parking area. An 8" main is within the easement.

Wastewater flow from the Substation averages less than 100 gallons per day.

4. Electrical Power

Wood poles on the *makai* side of Farrington Highway support overhead 46KV and 12KV electrical systems owned by Hawaiian Electric Company ("HECO"). Power to the Station is provided through underground conduits from pole-mounted transformers.

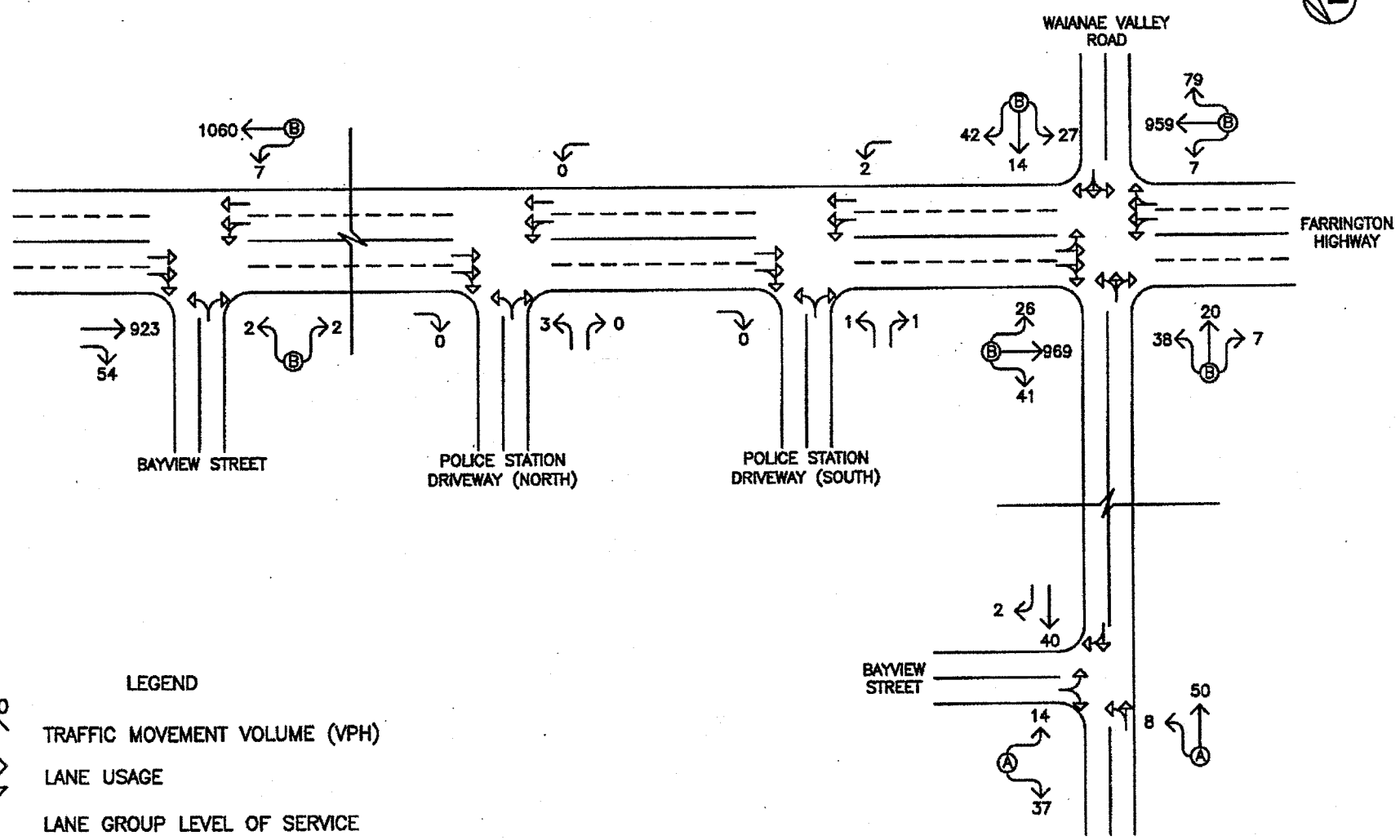
Overhead telephone and cable TV lines share the utility poles with HECO.

5. Solid Waste

Trash containers are placed on the sidewalk fronting Farrington Highway for pick-up and disposal by the City and County of Honolulu.

6. Protective Services

The Wai'anae Fire Station (Station 26) is located about 0.5 miles to the northwest on Farrington Highway. An engine company and ladder company are posted to the station.

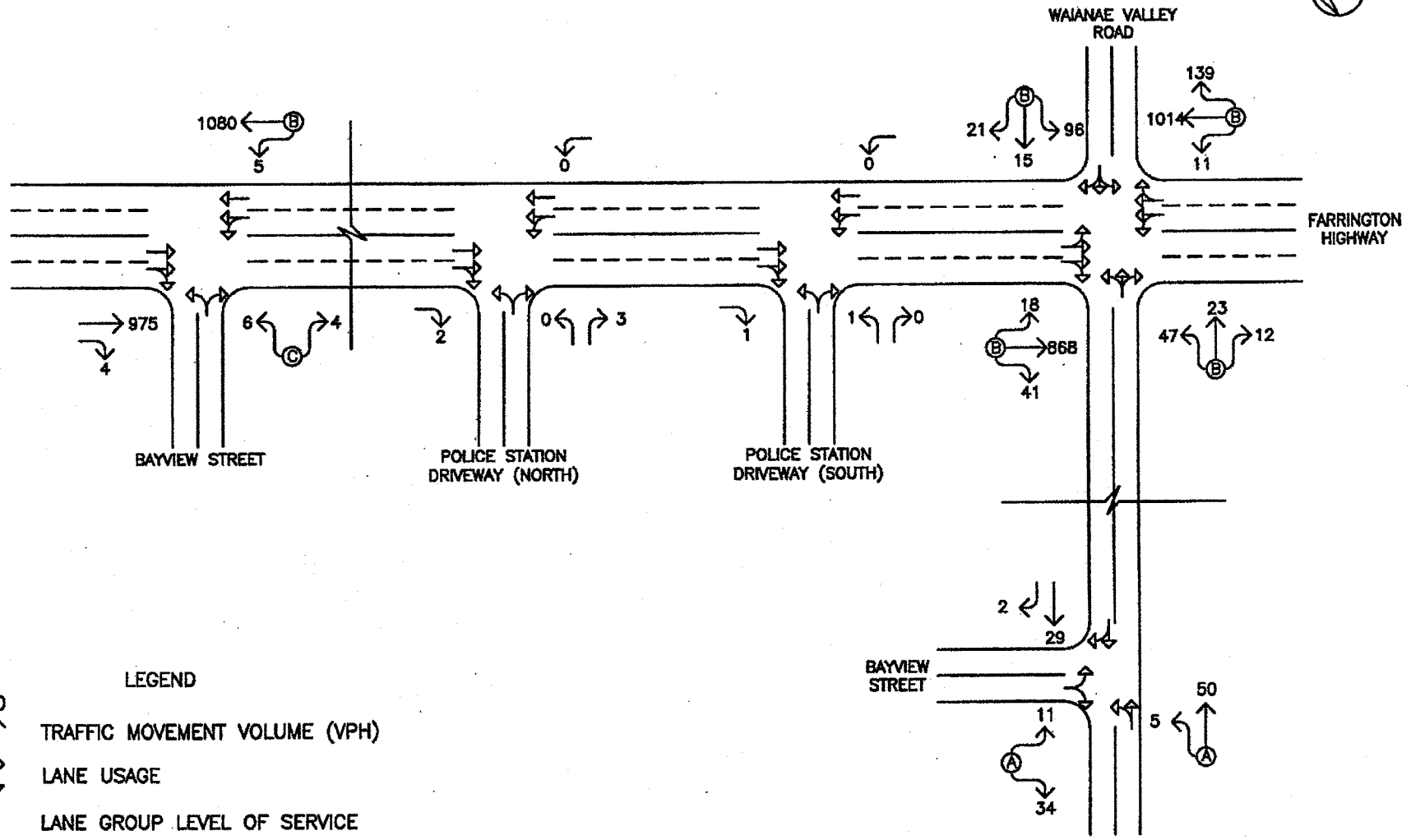


WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

EXISTING AM PEAK HOUR OF TRAFFIC

FIGURE 7



WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

EXISTING PM PEAK HOUR OF TRAFFIC

FIGURE 8

7. Parks and Recreation

Pōka'ī Bay Beach Park, one of eight City beach parks in the Wai'anae District, is located *makai* of the Police Substation. According the Park (2000), "Pokai Bay Beach Park is regarded by many Wai'anae residents as the most popular and heavily used beach park on the Wai'anae Coast. Bounded by a breakwater, its protected waters provide a safe haven for ocean recreation activities such as swimming, snorkeling, boating, and paddling for people of all ages. Its wide, crescent shaped white sand beach is used for sunbathing and for playing in the sand and in the shorebreak."

Improvements include a boat ramp for small boats, a breakwater, bath house, outdoor showers, 2 lifeguard towers, picnic areas, off-street parking for boat trailers, and vehicles, and a recently constructed canoe *halau.*

Wai'anae District Park is located to the northwest about 0.75 and 1.0 miles away, respectively. The park is owned by the City and County of Honolulu and improved with indoor and outdoor recreation facilities including a gymnasium, community and senior center building, outdoor courts for basketball and tennis, a softball field, and a football/soccer field.

Wai'anae Small Boat Harbor, a State of Hawai'i owned and operated boat ramp and harbor, is situated between the two County parks.

SECTION 3
SUMMARY OF POTENTIAL ENVIRONMENTAL IMPACTS AND MEASURES TO MITIGATE ADVERSE EFFECTS

A. Assessment Process

The scope of the project was discussed with staff of the Department of Design and Construction, HPD administrative staff, and the consulting architect. State and County agencies were contacted for information relative to their jurisdiction, expertise, and areas of concern. Time was spent in the field noting site conditions and conditions in the vicinity of the Wai'anae Substation. From the discussions and field investigations, existing conditions and features that could be affected by or affect the project were identified. These influencing conditions are:

- There are no recorded archaeological features on the premises;
- The site is free of geological hazards;
- There are no rare, threatened, or endangered flora and fauna on the premises;
- There are no surface water bodies on the property;
- Portions of the site are in flood hazard zone AE;
- The Station is not located on or along the shoreline;
- Existing public infrastructure and utilities are adequate; and
- Planned off-street parking for Pōka'ī Bay Beach Park will be transferred to HPD.

The proposed Wai'anae Police Station is proposed on land that was previously altered by urban type uses. Historical data reveals that the existing Substation was built in the early 1960's for use as a courthouse and police station. The site thus has already been significantly altered by construction activities and public uses over the past 50+ years. In addition, the lots proposed for parking lot use were previously residential lots until they were acquired by the City and the dwelling units thereon demolished. These lots too have been significantly altered by previous construction and residential uses.

Prior to demolition, a licensed hazardous material contractor will inspect the building and grounds for lead based paints, asbestos containing materials, and signs of petroleum leaks or spills. If detected, hazardous materials will be removed and disposed of per State Department of Health standards and protocol.

Traps will be set to capture vectors that may be harbored inside the existing building and grounds. Infrastructure and utility systems will be cut and plugged.

Building demolition and activities associated with equipment mobilization/demobilization is projected to take six to eight weeks.

B. Short-term Impacts

1. Air Quality

Construction will temporarily affect air quality and the acoustical environment. Grubbing, demolition, grading, stockpiling, backfilling and other soil (or earth) moving activities will

raise fugitive dust that can settle in adjoining areas. Windy conditions coupled with exposed soil can create severe dust problems. The general contractor will employ dust control measures to prevent the work site and construction equipment and activities from becoming significant dust generators. Control measures shall comply with Chapter 60.1, Air Pollution Control, Title 11, Department of Health, State of Hawaii (and revisions thereto). The site work contractor may implement alternative methods adaptable to the scope of the improvements and features of the site.

Most construction equipment and vehicles are diesel powered and emit exhaust emissions typically high in nitrogen dioxide and low in carbon monoxide. The Federal and State nitrogen dioxide standard ---100mg/m^3 per annum---which is an annual standard, is not likely to be exceeded during construction. Carbon dioxide emissions should be less than that generated by automobile traffic on adjoining streets. Aldehyde odors from diesel equipment may be detected but should be dispersed by the prevailing winds.

Residences to the east and west of the job site and a commercial enterprise will experience dust and aldehyde odors. Dust screens will be erected as a dust control measure. The screens should be as high as the height of the dwellings adjoining the job site. Because the proposed action will be constructed in two phases, the drive in and residence on the south of the building site will experience dust and a temporary decline in general air quality during both construction phases.

2. Noise

Construction noise, like fugitive dust, cannot be avoided. Exposure to noise will vary by construction phase, the duration of each phase, and the type of equipment used during the different phases. Maximum sound levels in the range of 82-96 db(A) measured at 50 feet from the source will be generated by heavy machinery during the demolition and site work phase. After this phase is completed, reductions in sound levels, frequency, and duration can be expected as the building walls, roof, parking area, and interior improvements are constructed.

Community Noise Control regulations establish maximum permissible sound levels for construction activities occurring within "acoustical" zoning districts. Based on the residential zoning for the site, the site is considered to be located in the Class A zoning district for noise control purposes. The maximum permissible daytime sound level in the district attributable to stationary noise sources and equipment related to construction activities is 55 dBA during daytime (7:00 AM to 10:00 PM) and 45 dBA during nighttime (10:00 PM to 7:00 AM) (Chapter 46, Community Noise Control, 1996). As disclosed above, construction noise will exceed the 55 dBA threshold.

In general, construction activities cannot exceed the permissible noise levels for more than ten percent of the time within any twenty-minute period except by permit or variance. Any noise source that emits noise levels in excess of the maximum permissible sound levels cannot be operated without first obtaining a noise permit from the State Department of Health. Although the permit does not attenuate noise per se it regulates the hours during which excessive noise is allowed.

The general contractor will be responsible for obtaining and complying with conditions attached to the permit. Work will be scheduled between the hours of 7:00 AM to 3:30 PM

Mondays through Fridays. The contractor will also ensure that construction equipment with motors is equipped with mufflers in proper operating condition.

Noise will be audible over the entire construction period. All construction activities will comply with Chapter 46 Community Noise Control, Title 11, Administrative Rules, Department of Health, State of Hawaii.

Residential uses are an identified noise sensitive use. In consideration of community noise control regulations, conditions associated with a Noise Permit, and the proximity of residences to the job site, the site contractor should keep the adjoining residents informed of noise producing activities. The fast food restaurant and residence to the south of the site will experience construction noise during each of the building phases.

3. Erosion

Demolition and site work will soil creating opportunities for erosion (fugitive dust and suspended sediment in runoff). Grubbing, grading, and stockpiling of excavated and imported material will be performed in accordance with the erosion control ordinance of the City and County of Honolulu and grading plans approved by the Department of Planning and Permitting, City and County of Honolulu.

Best Management Practices (BMPS) for erosion and drainage control during construction will be incorporated into a detailed BMP plan. Silt curtains will be erected around work sites and gravel blankets placed at vehicle access points. Additional BMPS will be considered based on site conditions.

Construction work will exceed one (1) acre thus a NPDES General Permit Authorizing Discharges of Storm Water Associated with Construction Activity will be required from the State Department of Health.

4. Flora

A site inspection did not reveal the presence of rare, threatened, or endangered flora and fauna or candidates for that status. Recorded vegetation are common to the Island of O'ahu and the State of Hawai'i.

5. Archaeological Features

An archaeological survey for Pokai Bay Beach Park (Cultural Surveys Hawaii, 1999) did not reveal the presence of surface features on the parcels earmarked for HPD parking. The site of the existing Substation and parking lot has been extensively modified. No prehistoric or early historic cultural layer was revealed down to limestone bedrock during subsurface testing. Should excavation unearth subsurface archaeological sites, artifacts, cultural deposits, or burials work in the immediate area will cease and historic authorities notified for proper disposition of the finds.

6. Traffic

Construction work in the highway rights-of-way will affect east-west traffic flow on Farrington Highway and north-south traffic on Pōka'ī Bay Street. On occasion, construction related traffic may affect vehicle movement on Bayview Street. The contractor will implement

measures to minimize inconvenience to motorists, buses, pedestrians, and bicyclists during construction. These measures will include but are not limited to:

- Keeping one lane of traffic in either direction open at all times;
- Posting warning signs on both sides of the work area to alert motorists of road work and to slow traffic speed;
- Positioning traffic cones or other directional devices in the roadway to guide vehicles around work areas;
- Posting off-duty police officers for traffic control;
- Limiting construction to between 7:30 AM and 3:00 PM, Monday through Friday.

A traffic management plan will be submitted to the Department of Planning and Permitting for review and approval for road work on Pōka'ī Bay and Bayview Streets and to the Department of Transportation State of Hawaii for road work on Farrington Highway if required. Road sections affected by construction will be restored to pre-construction conditions or better. Open trenches will be covered with steel plates at the end of each working day and safety devices posted during night hours.

Construction vehicles hauling workers and material will contribute to traffic on Farrington Highway. Material deliveries will be scheduled to minimize impacts on local traffic. Materials will be off-loaded on-site. Should materials have to be unloaded in or adjoining road rights-of-way appropriate traffic control measures will be implemented.

C. Long-term Impacts

The anticipated long-term benefit is to renew a police presence in the Wai'anae community and the resumption of a prior public safety activity. The Station will serve as the new District 9 headquarters with complete HPD operational functions. In terms of law enforcement, this includes patrol functions, receiving and booking, investigation, and holding. A community-based District station will enable officers to carry out their public safety functions and foster relationships with those in the community they serve. Officers can devote more time in the community instead of commuting and/or transporting detainees for processing to the district headquarters at Kapolei. The new Station also marks the return of a fully functional station to the community and on a site the force previously occupied for 50+ years.

Inherent to its renewed presence, HPD will expand the number of "beats" on the Leeward Coast from 7 to 9. All beats will originate from the new Station.

In addition to its law enforcement functions, HPD is expected to expand its involvement in civic affairs. Existing HPD programs such as outreach programs for crime prevention, drug awareness, and traffic safety will originate from the new Station further solidifying their presence in the community.

A police station in Wai'anae generally will reduce the need for Leeward Coast residents to travel to Kapolei for police-related concerns.

Increases in water consumption, wastewater flow, and electrical usage are expected from the increase in manpower assigned to the Station. These impacts on community infrastructure cannot be avoided but measures will be implemented in the design and furnishings to help to reduce resource consumption. Some of these measures include

designing a structure in accordance with sustainable principals to meet LEED Silver Certification requirements, incorporating water restriction devices and low gallon restroom fixtures, installing energy efficient light fixtures and high efficiency air conditioning compressors and chillers, and using reflective coatings for the roof and exterior walls.

The proposed use will not adversely interfere with existing residential and commercial activities around the premises. Having a police station at this location should enhance the physical and psychological security for residents and business owners adjoining the Station and the community in general. Conversely, a functioning police station will generate noise throughout the day sometimes with "louder than usual" noises. The newest addition to the area is a two-story residential dwelling adjoining the police station which was not there when the Substation was fully operational. Its proximity to the Station *per se* suggests it will be exposed to the most noise. An existing CMU wall on the property line will help to mitigate noise at the ground level of the dwelling but not the upper level. HPD will consult with the owner about its activities at the Station with the objective of reaching mutually agreeable noise mitigation measures.

The proposed action will not directly affect existing ocean recreation activities at Pōkaʻī Bay Beach Park. The transfer of land from park to HPD use, however, will reduce the land area and concomitantly the number of stalls proposed in the Pōkaʻī Bay Beach Park Master Plan for beach parking in the area of Bayview Street. The purpose of the Master Plan was "to guide the orderly expansion of recreation and facility improvements at the Park and to provide shoreline recreation opportunities and facilities for the use and enjoyment of residents and visitors (Park, 2000)." The Master Plan proposed construction of a parking area for 125 standard and 6 handicapped stalls in the vicinity of Bayview Street (the southern half of which was to be closed and developed for parking). The proposed action will remove about half of the master plan parking area leaving space for about 74 standard and 6 handicapped stalls for beach parking on the *makai* side of the proposed HPD parking lot.

The availability of parking in this area would serve a public need for either beach parking or HPD parking. Given the public safety need to have a police presence in the community the loss of some beach parking cannot be avoided. The Department of Parks and Recreation, the Police Department, and the City administration have strived to balance recreation and public safety needs. The Memorandum of Agreement clearly shows that public safety is the City's priority for all who reside and visit the Leeward Coast.

The Pōkaʻī Bay Beach Park Master Plan is not a static plan and as written it was never intended to be "cast in stone".. Master Plans are guides to a future end state and should be "revisited" as community needs change. Because the park is owned and maintained by the City, changes in City priorities and policies are initiating this change in park land use.

The cultural assessment did not reveal traditional cultural practices directly associated with the subject properties thus long-term impacts on traditional practices are not anticipated. The cultural assessment, however, included the recommendations below to help mitigate potentially adverse effects that the proposed project may have on Hawaiian cultural practices, beliefs and resources in and near the project area.

1. Cultural and archaeological monitoring should be conducted during all phases of construction.

2. Personnel involved in development activities in the project area should be informed of the possibility of inadvertent cultural finds, including human remains. Should cultural or burial sites be identified during ground disturbance, all work should immediately cease, and the appropriate agencies notified pursuant to applicable law.

3. View corridors between Kū'īlioloa Heiau and other cultural sites in the Wai'anae Ahupua'a should not be obstructed. This will ensure the continued use of the *heiau* as a resource for the teaching of traditional navigation, wave currents, and star studies.

Vehicle trips generated by the proposed Station were determined based upon the number of employees and visitors. The Station will be staffed 24 hours a day, seven days a week with 3 work shifts per day and 30 employees per shift. There are nine (9) visitor parking stalls and they are assumed to be 100% occupied with all stalls turning over during the AM and PM peak hour.

The calculation yields 30 employee vehicles entering and exiting the site during both AM and PM peak hours and 9 vehicles entering and exiting the visitor parking lot during the AM and PM peak hours. Thus a total of 69 vehicles (60 employees and 9 visitors) is projected to enter and exit the respective parking lots during AM and PM peak hours.

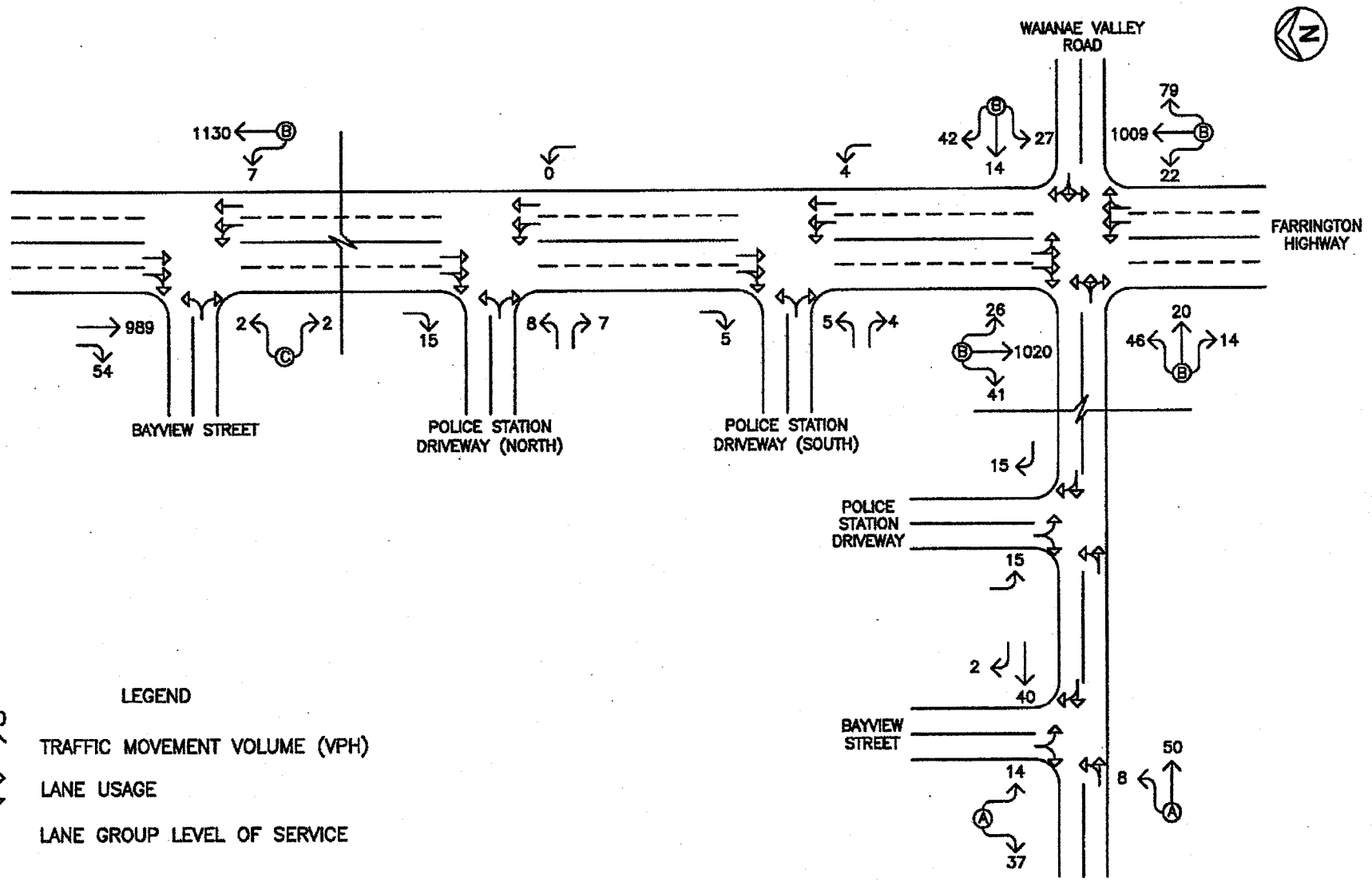
The year 2019 cumulative AM and PM peak hour traffic conditions with the redevelopment of the Wai'anae Police Station are summarized in Table 3. Peak hour traffic circulation during AM and PM peak hours with the Project are shown in Figures 9 and 10.

Table 3. Existing and Projected (Without and With Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement		AM			PM		
				Year 2019			Year 2019	
			Exist	w/out Proj	w/ Proj	Exist	w/out Proj	w/ Proj
Farrington Hwy/ Waianae Valley Rd	**Eastbound**	**LT-TH-RT**	**B**	**B**	**B**	**B**	**B**	**B**
	Westbound	**LT-TH-RT**	**B**	**B**	**B**	**B**	**B**	**B**
	Northbound	**LT-TH-RT**	**B**	**B**	**B**	**B**	**B**	**B**
	Southbound	**LT-TH-RT**	**B**	**B**	**B**	**B**	**B**	**B**
Farrington Hwy/ Bayview St	**Eastbound**	**LT-RT**	**B**	**C**	**C**	**C**	**C**	**C**
	Northbound	**LT-TH**	**B**	**B**	**B**	**B**	**B**	**B**
Waianae Valley Rd/ Bayview St	**Eastbound**	**LT-TH**	**A**	**A**	**A**	**A**	**A**	**A**
	Southbound	**LT-RT**	**A**	**A**	**A**	**A**	**A**	

Source: Wilson Okamoto Corporation, 2009.

Traffic operations in the project vicinity are expected to remain similar to existing and year 2019 without project conditions despite the addition of site-generated vehicles to the surrounding roadway network (Wilson Okamoto, 2009). At the intersections of Farrington Highway with Wai'anae Valley Road, the critical traffic movements are expected to continue

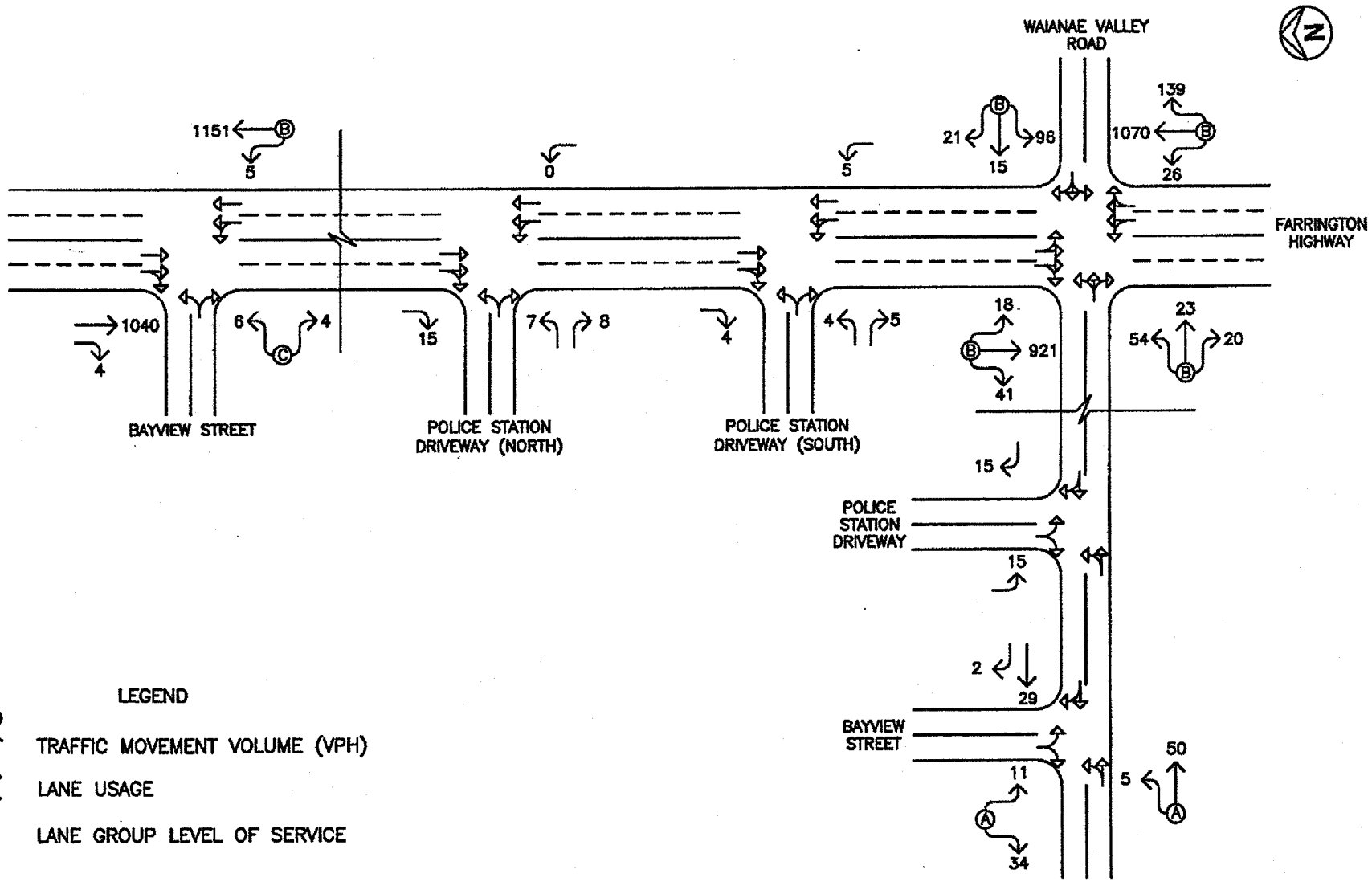


WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

YEAR 2019 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 9



WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

YEAR 2019 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 10

operating at LOS "B" during both peak periods. At the intersection of Farrington Highway with Bayview Street, the critical traffic movements are expected to continue operating at LOS "C" or better during both peak periods. At the intersection of Wai'anae Valley Road with Bayview Street, the critical traffic movements are expected to continue operating at LOS "A" during both peak periods.

The proposed redevelopment of the Wai'anae Police Station is not expected to significantly impact traffic operations in the project vicinity. The critical traffic movements at the intersections in the project vicinity are anticipated to continue operating at levels of service similar to existing and without project conditions. In addition, the total traffic volume entering the intersections along Farrington Highway is expected to increase by less than 2% during both peak periods. Those increases in the total traffic volumes are in the range of daily volume fluctuations along those roadways and represent a minimal increase in the overall traffic volumes.

The new Station will be larger in mass and scale than the existing district station thus presenting a different building form to be publically seen at this location. The Station floor area is approximately three times the existing floor area and at a height of 38 feet, the two story building exceeds the 25-foot height limit for the district. Architectural design elements such as windows with overhangs and sloping roofs will soften the exterior of the building when seen from Farrington Highway. Vertical landscape elements such as coconut palms placed along the building and street frontage will help to break up the building's mass and provide visual orientation for visitors. Medium-sized flowering canopy trees planted along driveways and within the parking lots will provide shade, aid in visual screening of parking areas, and help to reduce pavement glare.

The radio tower and antennas mounted on the tower is essential to link communications between the Wai'anae Police Station and public safety communication facilities throughout the City and County of Honolulu. Public safety agencies such as HPD, the Honolulu Fire Department, the Department of Emergency Management, and the Department of Information Technology rely on constant radio transmission and reception to maintain their communication capabilities. Mounted on the roof, the tower will be removed from the tsunami inundation and flood zones at ground level.

Conversely, the radio tower and antennas will be visible from many in-town locations and higher elevated areas *mauka* of town. Indirectly, it will act as a visual feature identifying the location of the police station. Building Perspectives of the District Station and the tower are shown on Sheet A-7.

NORTHWEST VIEW

NORTHEAST VIEW

SOUTHWEST VIEW

SOUTHEAST VIEW

A BUILDING PERSPECTIVES
SCALE:

A-7

SCHEMATIC DESIGN SUBMITTAL
OCTOBER 2009

WAIANAE POLICE STATION REPLACEMENT

WAIANAE, OAHU, HAWAII

INTĔGRUS ARCHITECTURE

ARCHITECTS·HAWAII LIMITED

SECTION 4
SPECIAL MANAGEMENT AREA OBJECTIVES AND POLICIES

The relationship of the proposed project to Special Management Area objectives and policies is discussed in this section. The Special Management Area objectives and policies are the same policies for Coastal Zone Management (Chapter 205A, Hawai'i Revised Statutes.

A. Coastal Zone Management Objectives

1. Recreational Resources

   (A) Provide coastal recreational opportunities accessible to the public.

2. Historic Resources

   (A) Protect, preserve, and, where desirable, restore those natural and manmande historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

3. Scenic and Open Space Resources

   (A) Protect, preserve, and, where desirable restore or improve the quality of coatal scenic and open space resources.

4. Coastal Ecosystems

   (A) Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal resources.

5. Economic Uses

   (A) Provide public or private facilities and improvements important to the State's economy in suitable locations.

6. Coastal Hazards

   (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

7. Managing Development

   (A) Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

8. Public Participation

(A) Stimulate public awareness, education, and participation in coastal management.

9. Beach Protection

(A) Protect beaches for public use and recreation.

10. Marine Resources

(A) Implement the State's ocean resources management plan.

B. Coastal Zone Management Policies

(1) Recreational Resources

(A) Improve coordination and funding of coastal recreational planning and management; and

(B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:

(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;

(ii) Requiring replacement of coastal resources having significant recreational value, including but not limited to surfing sites, fishponds, and sand beaches, when such resources will be unavoidable damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, county planning commissions; and crediting such dedication against the requirements of section 46-6.

Statement: The proposed action will neither affect recreational opportunities at or along the shoreline nor impede public access to coastal recreation areas.

2) Historic Resources

(A) Identify and analyze significant archaeological resources;
(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and
(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

Statement: An archaeological surface survey conducted for the Pōka'ī Bay Beach Park Master Plan performed subsurface testing on former residential lots *mauka* of Bayview Street. The survey and testing did not find surface or subsurface archaeological features on the lots. These former house lots are proposed for HPD vehicle parking.

3) Scenic and Open Space Resources

(A) Identify valued scenic resources in the coastal zone management area;
(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;
(C) Preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources; and
(D) Encourage those developments which are not coastal dependent to locate in inland areas.

Statement: The proposed improvements will not adversely affect scenic and open space resources along this coastal section of Farrington Highway. A Coastal View Study (1987) for the island of Oahu including the Wai'anae Coast did not identify scenic and open space resources between the Substation and the ocean.

4) Coastal Ecosystems

(A) Improve the technical basis for natural resource management;
(B) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
(C) Minimize disruption or degradation of coastal water ecosystems bys efficient regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and
(D) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

Statement: The project is not proposed in an area of open waters, potential fisheries, fishing grounds, and wildlife habitats. There are presently no wetlands, perennial streams, ponds or other bodies of water, and coastal ecosystems on the premises.

5) Economic Uses

(A) Concentrate coastal dependent development in appropriate areas;

(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
(i) Use of presently designated locations is not feasible;
(ii) Adverse environmental effects are minimized; and
(iii) The development is important to the State's economy.

Statement: Although the proposed District Station is located in the Special Management Area, it is not a coastal dependent development.

6) Coastal Hazards

(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
(D) Prevent coastal flooding from inland projects; and
(E) Develop a coastal point and nonpoint source pollution control program.

Statement: The District Station is proposed on tax parcel 051 which is not located in a flood hazard or coastal high hazard area.

The existing parking lot behind the station (which will continue to be used for parking) is located in a 100-year flood hazard area (Zone AE 8'). The three lots (or portions thereof) to be transferred to the Police Department from Pōka'ī Bay Beach Park are located in a 100-year flood hazard area (Zone AE 10') and subject to coastal wave action ((Zone VE 12').

No structures are proposed on any of the three lots to be set aside for police parking.

7) Managing Development

(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and
(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life-cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

8) Public Participation

(A) Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program;
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Statement: A Major Special Management Area ("SMA") Permit is required for the project. The Department of Planning and Permitting ("DPP") will schedule a public hearing as part of the SMA review process. Notice of the public hearing will be published in a local daily newspaper. Adjoining property owners and lessees will be notified by mail as to the time and place of the hearing.

After the public hearing is closed, the DPP will forward its findings and recommendation to the City Council for its consideration and decision. The Council's Zoning Committee will hear and receive testimony on the item. The Zoning Committee will forward its recommendation to the Honolulu City Council for decision. The public also has the opportunity to offer testimony to the Honolulu City Council before a decision is rendered. The hearing procedures provide ample opportunity for the public to comment on the SMA Permit application.

9) Beach Protection

(A) Locate new structures inland form the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;
(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and
(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

Statement: The proposed improvements are not located directly on a beach or in the shoreline setback area for Pōka'ī Bay Beach Park.

10) Marine Resources

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
(B) Assure that the use and development of marine and coastal resources are ecologically and environmental y sound and economically beneficial;
(C) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;
(D) Assert and articulate the interest of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

(E) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate and impact upon ocean and coastal resources; and
(F) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Statement: The project does not propose the use of marine resources and will not affect marine resources and beach processes associated with Pōka'ī Bay.

SECTION 5
ALTERNATIVES TO THE PROPOSED ACTION

A. No Action

A No Action alternative will maintain the status quo of the building site and the physical environment and preclude the occurrence of all impacts, short and long term, beneficial and adverse described in this Assessment.

The Wai'anae facility will continue to function as a Substation with District Headquarters at Kapolei. There should be no change in protective service to residents all Leeward Coast communities regardless of where a station is located. A No Action alternative, however, will preclude plans to create a separate district (District 9) for the Leeward Coast and decentralize police service into the community.

B. Alternative Site

A Site Selection Study was not performed thus alternative locations for a new District Station was not evaluated.

SECTION 6
AGENCIES AND ORGANIZATIONS TO BE CONSULTED

City and County of Honolulu

- Board of Water Supply
- Department of Facility Maintenance
- Department of Environmental Services
- Department of Parks and Recreation
- Department of Planning and Permitting
- Department of Transportation Services

State of Hawaii

- Department of Land and Natural Resources
  - Historic Preservation Division
- Department of Health
  - Environmental Planning Office
  - Office of Environmental Quality Control
- Department of Transportation

Other

- Hawaiian Electric Company
- Hawaiian Telcom
- L&L Drive In
- Wai'anae Coast Neighborhood Board No. 24
- Nanakuli-Maili Neighborhood Board No. 36
- The Honorable Todd Apo, Honolulu City Council
- The Honorable Colleen Hanabusa, 21st Senatorial District
- The Honorable Karen Awana, 44th Representative District
- The Honorable Maile Shimabukuro, 45th Representative District
- Wai'anae Public Library (Placement)

SECTION 7
PERMITS AND APPROVALS

Permits and approvals required for the project and approving authorities are listed below. Additional permits and approvals may be required pending final construction plans.

City and County of Honolulu

Honolulu City Council

Public Infrastructure Map Amendment
Special Management Area Permit

Board of Water Supply

Water and Water System Requirements for New Developments

Department of Planning and Permitting

Grubbing, Grading, and Stockpiling Permit
Building Permit for Building, Electrical, Plumbing, Sidewalk/Driveway and Demolition Work
Sewer Connection
Waiver

Department of Transportation Services

Street Usage Permit

State of Hawaii

Department of Health

NPDES General Permit (Tentative)
Variance from Pollution Control (Noise Permit)

Department of Transportation

Permit to Perform Work within State Highway Right-of-Way

SECTION 8
DETERMINATION OF SIGNIFICANCE

Chapter 200 (Environmental Impact Statement Rules) of Title 11, Administrative Rules of the State Department of Health, establishes criteria for determining whether an action may have significant effects on the environment (§11-200-12). The relationship of the proposed project to these criteria is discussed below.

1) **Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;**

   The proposed project does not involve a commitment to loss or destruction of any natural or cultural resources. The cultural assessment concluded that there are no cultural resources associated with the site *per se.* Mention was made of the possibility of *kupuna iwi* being unearthed during construction. It is a standard construction practice that all who perform site work are informed of proper protocol if any burials are unearthed. If burials are unearthed, work in the immediate area will cease and historic authorities notified for disposition of the finds per State law.

2) **Curtails the range of beneficial uses of the environment;**

   The proposed District Station will be constructed on the same site as the existing sub-station and serve the same purpose the sub-station used to serve prior to the transfer of police personnel and functions to the Kapolei District Station. Although the proposed District Station will be larger in size, the larger facility is needed to reestablish and accommodate a police presence on the Leeward Coast. This is considered to be a beneficial use of the environment.

   The area proposed for police vehicle parking is also proposed for beach parking. Although the proposed uses are the same, the Honolulu Police Department and the Department of Parks and Recreation have agreed that police vehicle parking is priority.

3) **Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in chapter 344, Hawaii Revised Statutes, and any revisions thereof and amendments thereto, court decisions or executive orders;**

   The project does not conflict with long-term environmental policies, goals, and guidelines of the State of Hawaii.

4) **Substantially affects the economic welfare, social welfare, and cultural practices of the community or State;**

   The project will not substantially affect the economic or social welfare of the State.

   Cultural practices associated with the site have not been identified.

5) **Substantially affects public health;**

   Public health should not be adversely affected by the proposed project.

13) Requires substantial energy consumption.

Energy requirements have not been determined. Energy use will increase over existing conditions but installation of energy efficient lighting and equipment will help to reduce overall consumption. The District Station will be designed in accordance with "LEED" Silver Certification requirements which should help to reduce energy consumption, environmental impacts, and reduce long-term operating costs.

REFERENCES

Architects Hawaii. October 2009. *Schematic Design Plans.*

Chang, William. December 2008. *Wai'anae Police Station Replacement Facility Master Plan.*

Chu, Michael S. and Robert B. Jones. 1987. *Coastal View Study.* Prepared for City and County of Honolulu, Department of Land Utilization.

Cultural Surveys Hawaii. December 1999. *Subsurface Archaeological Survey for the Proposed Pōka'ī Bay Beach Park, Pōka'ī Bay, Wai'anae, O'ahu, Hawai'i.* Prepared for Calvin Kim & Associates.

Cultural Surveys Hawaii. October 2009. *Cultural Impact Assessment for the Wai'anae Police Substation Project, Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu TMK: [1] 8-5-008: 040, por., 041, 043, 044 por., 051*

Department of Geography, University of Hawaii. 1983. *Atlas of Hawaii Second Edition.* University of Hawaii Press. Honolulu.

Department of Planning and Permitting, City and County of Honolulu. October 1986. *Land Use Ordinance. Ordinance No. 86-96 As Amended.*

Department of Planning and Permitting, City and County of Honolulu. July 2000. *Wai'anae Sustainable Communities Plan.*

Federal Emergency Management Agency. September, 2004. *Flood Insurance Rate Map.* Community Panel No. 15003C0185F.

Kim & Shiroma Engineers, Inc. September 1999. *Pokai Bay Beach Park Master Plan.*

Mink, John F. and L. Stephen Lau. February 1990 Revised. *Aquifer Identification and Classification for Oah'u: Groundwater Protection Strategy for Hawai'i.* Water Resources Research Center, University of Hawaii at Manoa.

Park, Gerald Urban Planner. 2008. *Field Observation.*

Park, Gerald Urban Planner. November 1994. *Final Environmental Assessment Wai'anae Police Station Parking Lot.* Prepared for Building Department, City and County of Honolulu.

Park, Gerald Urban Planner. June 2000. *Final Environmental Assessment Pokai Bay Beach Park Master Plan.* Prepared for Department of Design and Construction, City and County of Honolulu

Park, Gerald Urban Planner. July 2008. *Final Environmental Assessment Honolulu Community Action Program Wai'anae District Center Renovations, Wai'anae, Oahu, Hawaii.* Prepared for Honolulu Community Action Program.

U.S. Department of Agriculture, Soil Conservation Service. August 1972. *Soil Survey Report for Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* In Cooperation with the University of Hawaii Agricultural Experiment Station.

Wilson Okamoto Corporation. June 2009. *Traffic Impact Report for the Proposed Wai'anae Police Station Redevelopment.* Prepared for Bill Chang, AIA.

APPENDIX A

Cultural Impact Assessment for the Wai'anae Police Substation Project, Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu
TMK: [1] 8-5-008: 040, por., 041, 043, 044 por., 051

Cultural Impact Assessment for the Honolulu Police Department Wai'anae Substation Project Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051

Prepared for
Gerald Park Urban Planner
Honolulu, Hawai'i

Prepared by
Brian Kawika Cruz, B.A.,
Constance R. O'Hare, B.A.,
Dominique Leu Cordy B.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai'i, Inc.
Kailua, Hawai'i
(Job Code: WAIANAE 1)

October 2009

O'ahu Office
P.O. Box 1114
Kailua, Hawai'i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1993 Main Street
Wailuku, Hawai'i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Cultural Impact Assessment for the Honolulu Police Department Wai'anae Substation Project, Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu (TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051) Cruz et al. (2009)
Date	October 2009
Project Number(s)	Cultural Surveys Hawai'i (CSH) Job Code: WAIANAE 1
Project Location	The project area is bounded to the east by Farrington Highway, to the south by Wai'anae Valley Road, and to the west by Bayview Street and Pōka'ī Beach Park, in Wai'anae Ahupua'a, Wai'anae District, O'ahu Island and comprises TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051. The project area is depicted on the U.S. Geological Survey 7.5-Minute Series Topographic Map, Wai'anae Quadrangle (1998) (see Figure 3).
Land Jurisdiction	The existing substation property is owned by the City and County of Honolulu, under the jurisdiction of the Honolulu Police Department, and the State of Hawai'i.
Agencies	State of Hawai'i Department of Land and Natural Resources / State Historic Preservation Division (DLNR / SHPD)
Project Description	The proposed Honolulu Police Department Wai'anae Substation Project will be built in two phases. **Phase I** proposes the construction of a two-story, 20,000-square-foot building (10,000 square feet per floor), fueling station, and parking for police vehicles, impound vehicles, and visitors. It also includes the replacement of the City's existing radio communications facility that shares the site. The radio facility improvements include a new radio tower (70 feet high measured from top to ground) and a 500-square-foot equipment building. Both will likely be located on top of the new two-story police station to avoid flood water inundation. **Phase II** construction will add a two-story, 4,800-square-foot building (2,400 square feet per floor) to the east side of the Phase I building. When completed, the approximately 25,000-square-foot district station will accommodate patrol, investigative, and administrative units and associated support functions and facilities.
Project Acreage	The project area is approximately 1.25 acres (54,450 square feet).
Area of Potential Effect (APE)	The Area of Potential Effect (APE) for this Cultural Impact Assessment (CIA) includes the approximately 1.25-acre project area in the context of Wai'anae Ahupua'a and other places on O'ahu that may be traditionally associated or connected with Wai'anae and/or the

	project area.
Document Purpose	The project requires compliance with the State of Hawai'i environmental review process [Hawai'i Revised Statutes (HRS) Chapter 343], which requires consideration of a proposed project's effect on cultural practices and resources. At the request of Gerald Park Urban Planner, CSH conducted this CIA. Through document research and ongoing cultural consultation efforts, this report provides preliminary information pertinent to the assessment of the proposed projects' impacts to cultural practices and resources (per the *Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts*) which may include Traditional Cultural Properties (TCP) of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places, in accordance with Hawai'i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria (HAR §13-275-6) under Criterion E. The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS Chapter 6E-8 and Hawai'i Administrative Rules (HAR) Chapter 13-275.
Community Consultation	Hawaiian organizations, agencies and community members were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project area and the vicinity. The organizations consulted included the State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs (OHA), the O'ahu Island Burial Council (OIBC), and community and cultural organizations including Hui Mālama I Nā Kūpuna 'O Hawai'i Nei, and the Wai'anae Hawaiian Civic Club.
Results of Background Research	Background research on the project area and surrounding *ahupua'a* of Wai'anae indicates: 1. The project area is located in Wai'anae Ahupua'a, Wai'anae District, on the island of O'ahu, in TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051, bounded to the east by Farrington Highway, to the south by Wai'anae Valley Road, and to the west by Bayview Street and Pōka'ī Beach Park. 2. There are many legends associated with Wai'anae. It was said to have been the birthplace of the demi-god and trickster Māui (Fornander 1917:370) and the home of the pig-god Kamapua'a when he settled down to farm. 3. Wai'anae literally translates as "mullet water." Handy and Handy (1972:468) attribute the naming of Wai'anae to a large fresh water *loko* (pond, lake, pool) for mullet called Pueha [sic] (Puehu) located just inland of Pōka'ī Bay. *'Anae* refers to "full sized *'ama'ama* mullet fish" (Pukui and Elbert 1986:24).

	4. Pōka'ī Bay is famous as a school for priests, navigators and astrologers. These activities may have been centered on the *heiau* of Kū'īlioloa. 5. There are two named fish ponds (*loko i'a*) within the *'ili* (land section, subdivision of an *ahupua'a*) of Pāhoa, Loko Puehu and Loko Lopoko, both are shown on an 1884 map of the Wai'anae Coast by George Jackson. One account notes that the Puehu Fishpond pond was almost completely filled in by 1954 (E.S., Feb 1954 in Sterling and Summers 1978:70). 6. McAllister (1933) noted 16 sites within the *ahupua'a* of Wai'anae, including ten *heiau* (shrine, high place of worship), seven of which had been recorded as destroyed, the Puehu Fishpond, the Kawiwi fortress, and several house sites (see Figure 5). The abundance of *heiau* recorded within Wai'anae Ahupua'a reflects its fertility for cultivation and religious and political centrality within the district as well as its association with the *ali'i* or chiefly class. 7. Based on archaeological reports in and around the project area, over 32 sets of *iwi kūpuna* (ancestral skeletal remains) were encountered in a ten-year span at the Wai'anae Army Recreation Center (WARC): Kam and Ota (1984) reported two burials; archaeological monitoring (Riford 1984) during sewer line installation at the WARC unearthed five complete sets of *iwi kūpuna.* Hammatt et al. (1985) reported test-unit excavations identifying at least ten individual sets of remains; Schilz (1994) exposed 15 more sets of *iwi kūpuna* during an archaeological data recovery and intensive survey at the WARC. 8. After Kamehameha's death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the profitable sandalwood trade, resulting in an unrestrained demand on the stocks of the wood and upon the commoners who did the harvesting. By the middle of 1828, the stands of sandalwood above the Wai'anae coast may already have been depleted. Boki Kamauleule (made chief of Wai'anae by Kamehameha and also governor of O'ahu) supervised "collecting Sandalwood to pay [his] debts" (Kuykendall 1965:234).
Results of Community Consultation	CSH attempted to contact 22 individuals for this CIA (see Table 5); 12 responded; and four of those 12 *kūpuna* (elders) and/or *kama'āina* (native born) participated in formal "talk-story" interviews for more in-depth contributions to the CIA. To assist in discussion of natural and cultural resources and any cultural practices specific to the project area, CSH initiated the "talk-story" sessions with questions from five broad categories: Resource Gathering Practices, Marine and

	Freshwater Resources, Burials, Trails, and Historic Properties. Presented below are salient themes and concerns that emerged from participants' "talk-story" sessions about the proposed project area: 1. One participant expressed the significance of the Kū'īlioloa Heiau due to its prominent location along the shoreline. Mr. Cachola believes this *heiau* was the center locale for other cultural sites in the area noting that other cultural sites in the *ahupua'a* of Wai'anae have a direct line-of-sight to Kū'īlioloa Heiau thus making the *heiau* an important site for communication among the Hawaiian people. 2. Three participants recalled gathering various marine resources at Pōka'ī Bay during their youth such as *limu kohu* (*Asparagopsis taxiformis*), *limu wāwae'iole* (*Codium edule)* as well as sharp-quilled *wana* (*Echinothrix diadema*). They also mention fishing for *halalū* (young *akule* five to six inches) and *akule* (big-eyed scad, *Trachurops crumenopthalmus*). 3. Three participants recalled plant gathering in the area for both medicinal purposes as well as for eating. Items gathered in their youth include *pōpolo* (*Solanum nigrum*), a plant with dark berries, used to treat cancer; and *noni*, the Indian mulberry (*Morinda citrifolia*), used to treat arthritis. 4. Three participants are concerned for the potential unearthing of *iwi kūpuna* during the ground disturbing activities associated with the proposed Wai'anae District Police Substation project. Participants are aware of past *iwi kūpuna* discoveries in the vicinity of the project area and recommend the project proceed with caution and respect to *iwi kūpuna*. 5. One participant is concerned for the continued preservation of Kū'īlioloa Heiau for both ceremonial and educational purposes. 6. In a letter dated December 28, 2008, OHA mentioned the historic and cultural significance of Pōka'ī and the Kū'īlioloa Heiau at Kāne'īlio Point, and recommended several key community members of Wai'anae to consult for this project. 7. In a letter dated December 17, 2008, SHPD expressed concern for possible inadvertent discoveries of *iwi kūpuna* due to the project's proximity to the shoreline at Pōka'ī. SHPD also described the historic and cultural significance of the Kū'īlioloa Heiau at Kāne'īlio Point.
Recommendations	Based on the information gathered from the community consultation effort as well as archaeological and archival research presented in this report, the evidence indicates that the proposed Honolulu Police

	Department Wai'anae Substation Project may potentially have minimal impact on Hawaiian historic, natural and cultural resources and practices in Wai'anae Ahupua'a. A good faith effort to address the following recommendations would help mitigate potentially adverse effects the proposed project may have on Hawaiian cultural practices, beliefs and resources in and near the project area: 1. Cultural and archaeological monitoring should be conducted during all phases of construction. 2. Personnel involved in development activities in the project area should be informed of the possibility of inadvertent cultural finds, including human remains. Should cultural or burial sites be identified during ground disturbance, all work should immediately cease, and the appropriate agencies notified pursuant to applicable law. 3. View corridors between Kū'īlioloa Heiau and other cultural sites in the Wai'anae Ahupua'a, such as Pu'u Pāhe'ehe'e Heiau and Kamaile Heiau (see Figure 5), should not be obstructed. This will ensure the continued use of the *heiau* as a resource for the teaching of traditional navigation, wave currents and star studies.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of Gerald Park Urban Planner, Cultural Surveys Hawai'i Inc. (CSH) conducted a Cultural Impact Assessment (CIA) for the Honolulu Police Department Wai'anae Substation Project. The existing Honolulu Police Department Wai'anae Substation will be demolished and a new Wai'anae District substation will be erected on the same site. The project would be located in Wai'anae Ahupua'a, Wai'anae District, on the island of O'ahu (TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051) (Figure 1 to Figure 3).

The proposed Honolulu Police Department Wai'anae Substation will be built in two phases. Phase I proposes the construction of a two-story, 20,000-square-foot building (10,000 square feet per floor), fueling station, and parking for police vehicles, impound vehicles, and visitors. It also includes the replacement of the City and County of Honolulu's existing radio communications facility that shares the site. The radio facility improvements include a new radio tower (70 feet high measured from top to ground) and a 500-square-foot equipment building. Both will likely be located on top of the new two-story police station to avoid flood water inundation. Phase II construction will add a two-story, 4,800-square-foot building (2,400 square feet per floor) to the east side of the Phase I building. When completed, the approximately 25,000-square-foot substation will accommodate patrol, investigative, and administrative units and associated support functions and facilities of the Honolulu Police Department.

Parking for 62 vehicles is required. The existing parking lot can accommodate some but not all of the required parking. Through a Memorandum of Agreement, the Department of Parks and Recreation will transfer land master planned in the Pōka'ī Bay Beach Park for recreational use parking to the Honolulu Police Department. The approximately 0.25-acre area to be transferred will be used explicitly for on-grade parking by the Honolulu Police Department.

1.2 Document Purpose

The project requires compliance with the State of Hawai'i environmental review process [Hawai'i Revised Statutes (HRS) Chapter 343], which requires consideration of a proposed project's effect on cultural practices. CSH is conducting this CIA at the request of Gerald Park Urban Planner. Through documented research and cultural consultation efforts this CIA report provides information pertinent to the assessment of the proposed project's impacts to cultural practices and resources (per the *Office of Environmental Quality Control's Guidelines for Assessing Cultural Impacts*), which may include Traditional Cultural Properties (TCP) of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places, in accordance with Hawai'i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria (HAR §13–275–6) under Criterion E which states to be significant an historic property shall:

> Have an important value to the Native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still

carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group's history and cultural identity.

The document is intended to support the project's environmental review and may also serve to support the project's historic preservation review under HRS Chapter 6E–8 and Hawai'i Administrative Rules Chapter 13–275.

1.3 Scope of Work

The scope of work for this CIA includes:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.
2. Review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the parcel; present and past uses of the parcel; and/or other practices, uses, or traditions associated with the parcel and environs.
4. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

1.4.1 Natural Environment

The project area is located within the traditional Hawaiian land division (*ahupua'a*) of Wai'anae in the *moku* (district) of Wai'anae on the leeward coast of O'ahu. The project area is bounded to the east by Farrington Highway, to the south by Wai'anae Valley Road, and to the west by Bayview Street and Pōka'ī Beach Park and comprises TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051 (see Figure 1 and Figure 2). The project area is depicted on the U.S. Geological Survey 7.5-Minute Series Topographic Map, Wai'anae Quadrangle (1998) (see Figure 3).

The project area lies in central coastal Wai'anae Town on the karstic flats of an emerged limestone reef (Stearns 1940). The emerged reef formation is relatively flat with frequent sinkholes, depressions and cobble concentrations. The entire parcel is classified as coral rock outcrop (Foote et al. 1972) (Figure 4). The project area lies approximately two to three meters (m), or six to ten feet (ft), above mean sea level (amsl). The area is warm, as it is blocked from the prevailing cooling and rain-bearing trade winds by both the Ko'olau and Wai'anae Mountain Ranges. The vicinity receives less than ten inches of rainfall per year (Giambelluca et al. 1986), which is insufficient to support non-irrigated agriculture.

Natural vegetation in coastal areas of Wai'anae is almost exclusively exotic and is dominated by *kiawe* (*Prosopis pallida*), *koa haole* (*Leucaena leucocephala*), currant tomato (*Lycopersicon pimpinellifolium*), Chinese banyan (*Ficus microcarpa*), octopus tree (*Schefflera actinophylla*), aspera (*Achyranthes aspera*), Prickly pear cactus (*Opuntia megacantha*), sourbrush (*Pluchea carolinensis*), coral berry (*Rivina humilis*), *klu* (*Acacia farnesiana*), fountain grass (*Pennisetum setaceum*), finger grass (*Chloris* sp.) and aloe (*Aloe barbadensis*). The only native plants observed within the project area were *pili* grass (*Heteropogon contortus*) and the Polynesian introductions *kī* (*Cordyline terminalis*) and *noni* (*Morinda citrifolia*).

1.4.2 Built Environment

The Honolulu Police Department Wai'anae Substation lot includes the single-story police substation, a maintenance building, a parking lot, and paved roads between the structures (see Figure 1 below). It is landscaped with a few shrubs and trees. An approximately .025-acre area adjacent and *makai* (seaward) of the substation is currently part of the beach park, with low lying shrubs and several medium to large *kiawe*. No buildings or remnants of modern development are apparent in this small parcel.

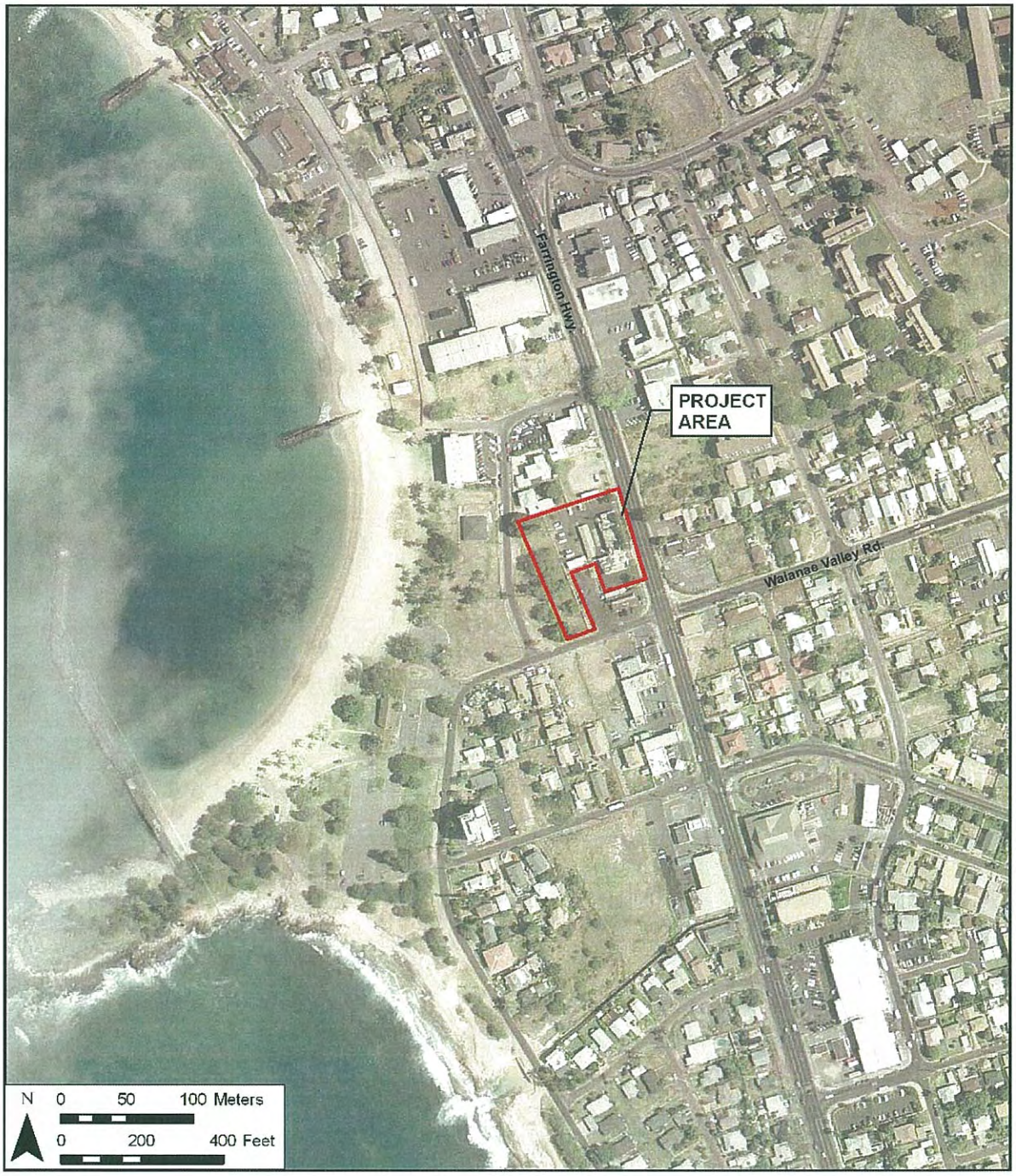


Figure 1. Aerial photograph, showing the location of the project area (source: U.S.G.S Orthoimagery 2005)

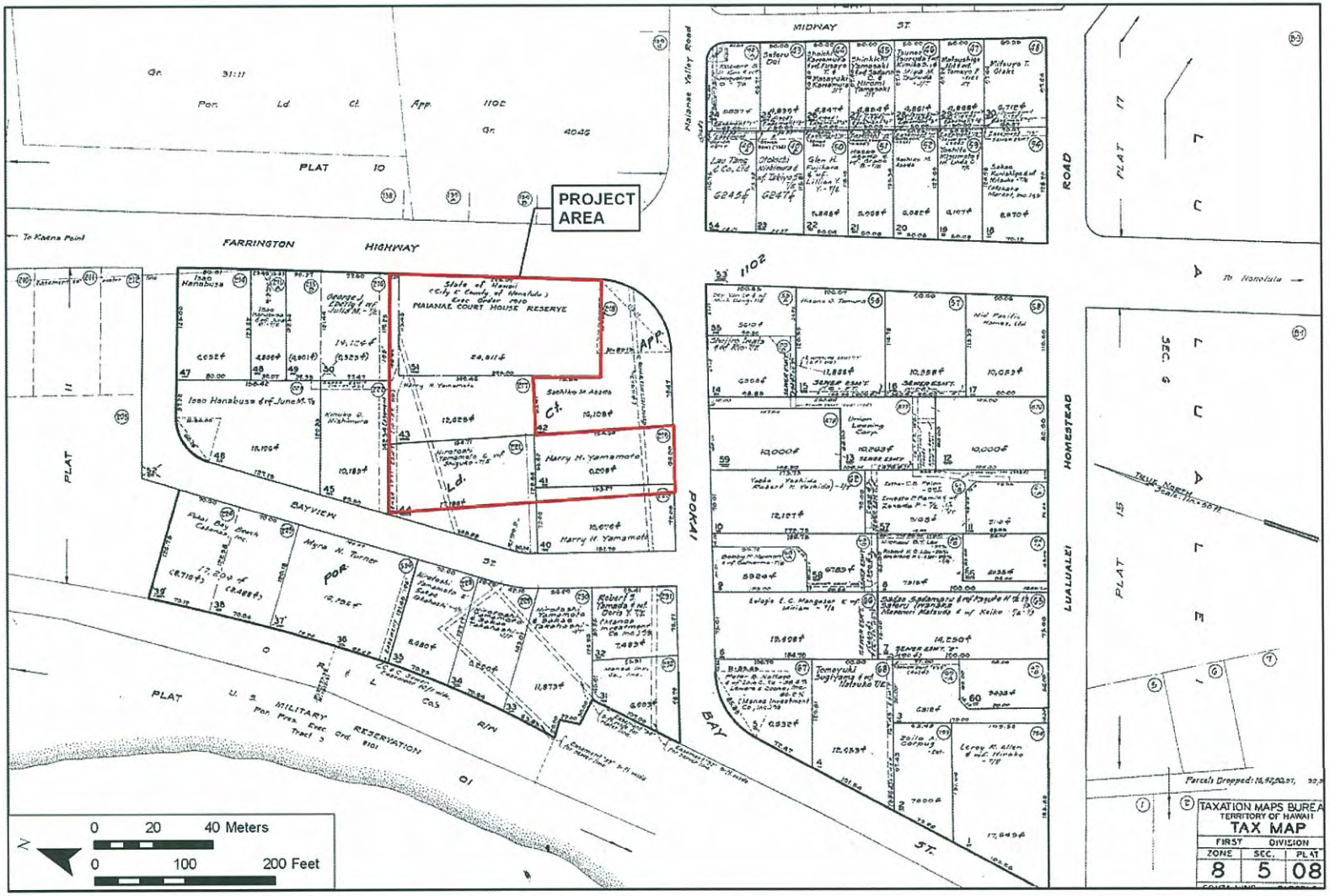


Figure 2. Tax Map Key (TMK) [1] 8-5-008, island of O'ahu, showing project area

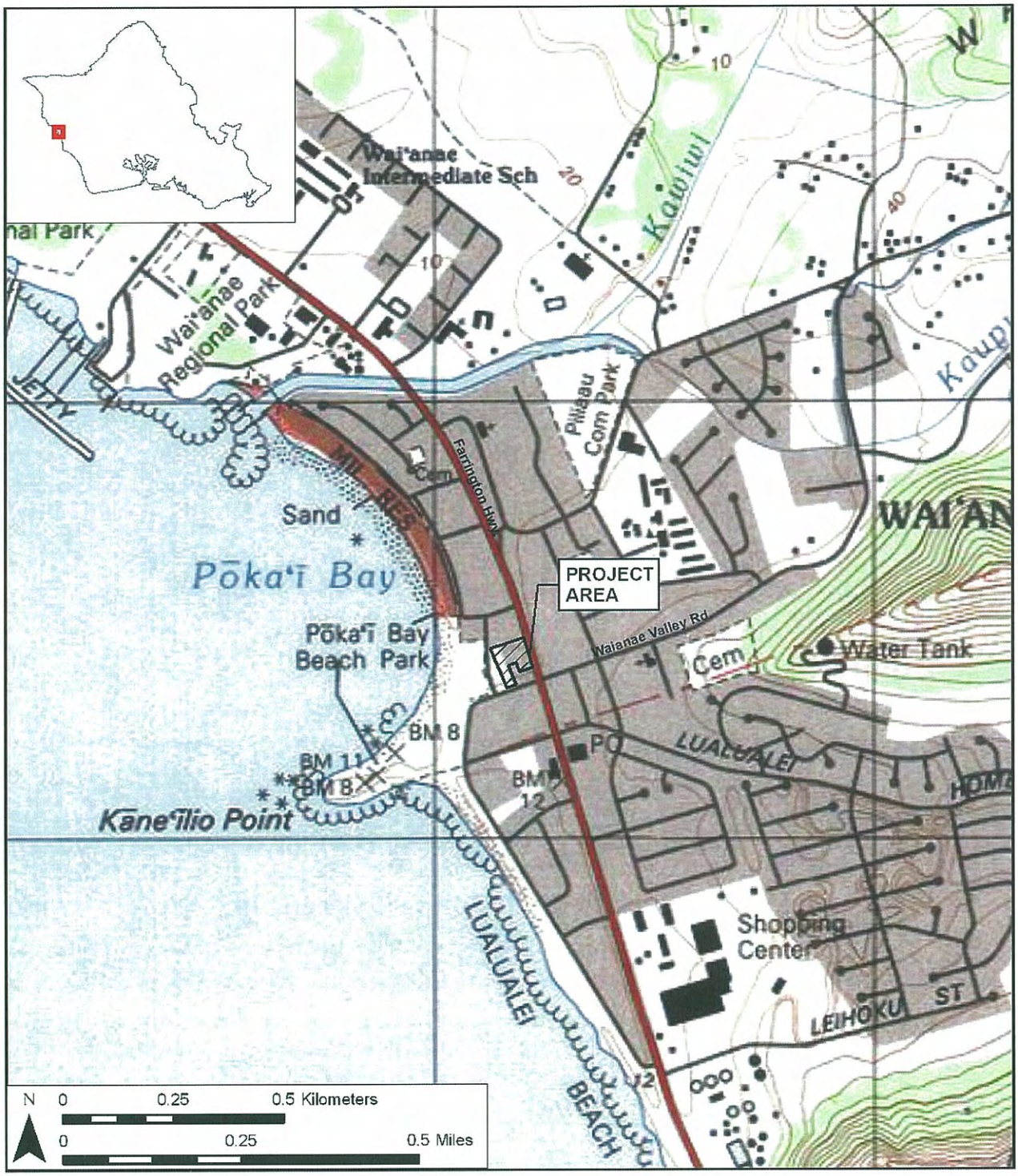


Figure 3. U.S. Geological Survey 7.5 Minute Series topographic map, Wai'anae Quadrangle (1998), showing project area location

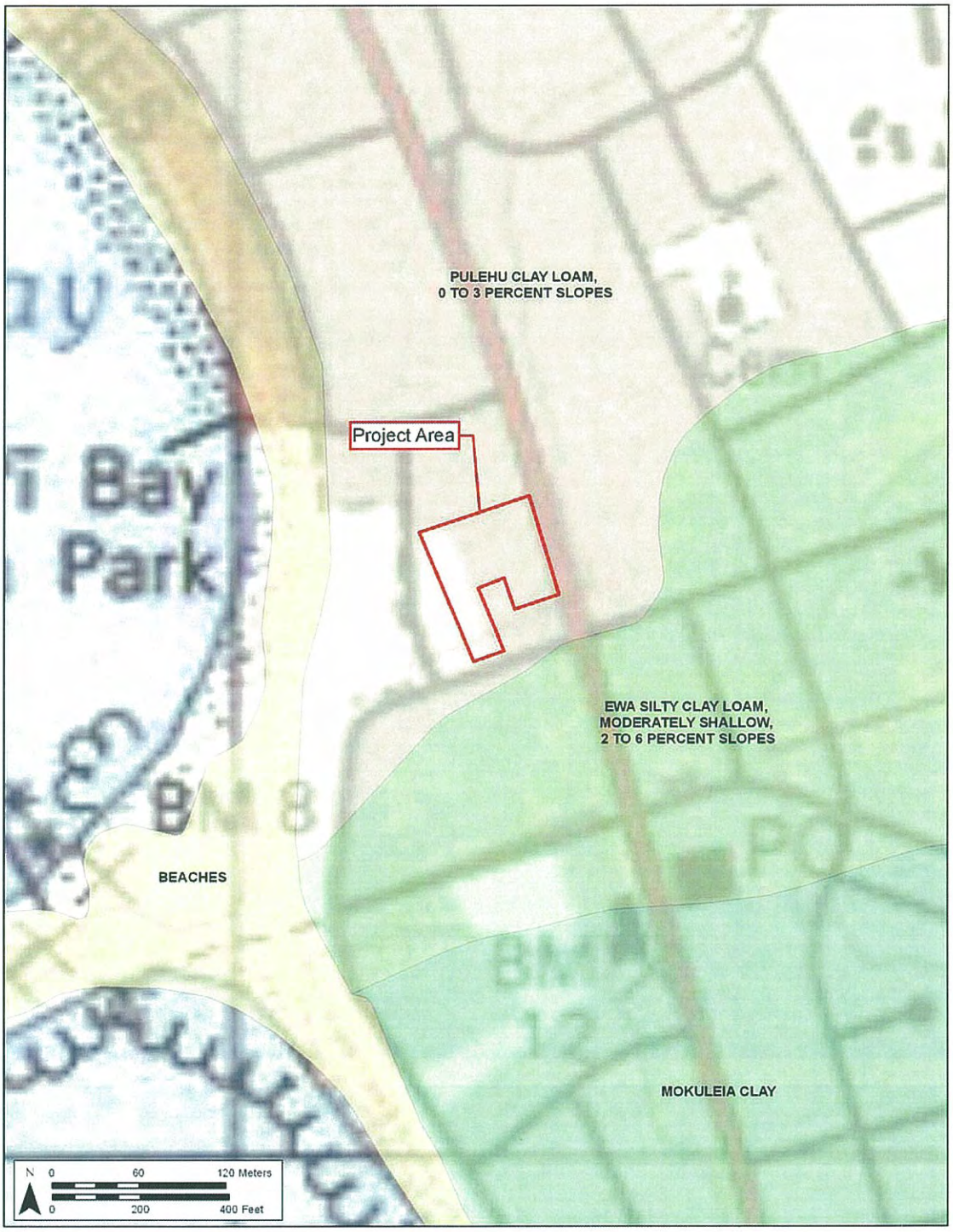


Figure 4. U.S. Geological Survey 7.5 Minute Series topographic map, Wai'anae Quadrangle (1998), showing soils in relation to project location (soil map from Foote et al. 1972)

Section 2 Methods

2.1 Archival Research

Historical documents, maps and existing archaeological information pertaining to Wai'anae Ahupua'a and the project area vicinity were researched at the CSH library and other archives including the University of Hawai'i at Mānoa's Hamilton Library, the State Historic Preservation Division library, the Hawai'i State Archives, the State Land Survey Division, and the archives of the Bishop Museum. Previous archaeological reports for the area were reviewed, as were historic maps and photographs and primary and secondary historical sources. Information on Land Commission Awards was accessed through Waihona 'Aina Corporation's Māhele Data Base (www.waihona.com) as well as a selection of CSH library references.

For cultural studies, research for the Traditional Background section centered on Hawaiian activities including: religious and ceremonial knowledge and practices; traditional subsistence land use and settlement patterns; gathering practices and agricultural pursuits; as well as Hawaiian place names and *mo'olelo* (stories and oral histories), *mele* (songs), *oli* (chants), *'ōlelo no'eau* (proverbs) and more. For the Historic Background section research focused on land transformation, development and population changes beginning in the early post–European Contact era to the present day (see Scope of Work above).

2.2 Community Consultation

2.2.1 Sampling and Recruitment

A combination of qualitative methods, including purposive, snowball, and expert (or judgment) sampling, were used to identify and invite potential participants to the study. These methods are used for intensive case studies, such as CIAs, to recruit people that are hard to identify, or are members of elite groups (Bernard 2006:190). Our purpose is not to establish a representative or random sample. It is to "identify specific groups of people who either possess characteristics or live in circumstances relevant to the social phenomenon being studied....This approach to sampling allows the researcher deliberately to include a wide range of types of informants and also to select key informants with access to important sources of knowledge" (Mays and Pope 1995:110).

We began with purposive sampling informed by referrals from known specialists and relevant agencies. For example, we contacted the State Historic Preservation Division (SHPD), Office of Hawaiian Affairs (OHA), O'ahu Island Burial Council (OIBC), and community and cultural organizations in Wai'anae for their brief response/review of the project and to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the project area and vicinity, cultural and lineal descendants of Wai'anae, and other appropriate community representatives and members. Based on their in–depth knowledge and experiences, these key respondents then referred CSH to additional potential participants who were added to the pool of invited participants. This is snowball sampling, a chain referral method that entails asking a few key individuals (including agency and organization representatives) to provide their comments

and referrals to other locally recognized experts or stakeholders who would be likely candidates for the study (Bernard 2006:192). CSH also employs expert or judgment sampling which involves assembling a group of people with recognized experience and expertise in a specific area (Bernard 2006:189–191). CSH maintains a database that draws on over two decades of established relationships with community consultants: cultural practitioners and specialists, community representatives and cultural and lineal descendants. The names of new potential contacts were also provided by colleagues at CSH and from the researchers' familiarity with people who live in or around the study area. Researchers often attend public forums (e.g., Neighborhood Board, Burial Council and Civic Club meetings) in (or near) the study area to scope for participants. Please refer to Table 5, Section 6, for a complete list of individuals and organizations contacted for this CIA.

CSH focuses on obtaining in-depth information with a high level of validity from a targeted group of relevant stakeholders and local experts. Our qualitative methods do not aim to survey an entire population or subgroup. A depth of understanding about complex issues cannot be gained through comprehensive surveying. Our qualitative methodologies do not include quantitative (statistical) analyses, yet they are recognized as rigorous and thorough. Bernard (2006:25) describes the qualitative methods as "a kind of measurement, an integral part of the complex whole that comprises scientific research." Depending on the size and complexity of the project, CSH reports include in–depth contributions from about one-third of all participating respondents. Typically this means three to twelve interviews.

2.2.2 Informed Consent Protocol

An informed consent process was conducted as follows: (1) before beginning the interview the CSH researcher explained to the participant how the consent process works, the project purpose, the intent of the study and how his/her information will be used; (2) the researcher gave him/her a copy of the Authorization and Release Form to read and sign; (3) if the person agreed to participate by way of signing the consent form *or* providing oral consent, the researcher started the interview; (4) the interviewee received a copy of the Authorization and Release Form for his/her records, while the original is stored at CSH; (5) after the interview was summarized at CSH (and possibly transcribed in full), the study participant was afforded an opportunity to review the interview notes (or transcription) and summary and to make any corrections, deletions or additions to the substance of their testimony/oral history interview; this was accomplished primarily via phone, post or email follow–up and secondarily by in–person visits; (6) participants received the final approved interview, photographs and the audio–recording and/or transcripts their interview if it was recorded. They were also given information on how to view the report on the OEQC website and offered a hardcopy of the report once the report is a public document.

If an interviewee agreed to participate on the condition that his/her name be withheld, procedures are taken to protect his/her confidentiality (see Protection of Sensitive Information below).

2.2.3 Interview Techniques

To assist in discussion of natural and cultural resources and cultural practices specific to the study area, CSH initiated "talk–story" sessions with (unstructured and semi–structured

interviews as described by Bernard 2006) asking questions from the following broad categories: gathering practices and *mauka* (upland, mountain) and *makai* resources, burials, trails, historic properties and *wahi pana* (storied or legendary place/s). The interview protocol is tailored to the specific natural and cultural features of the landscape in the study area identified through archival research and community consultation. For example, for this study marine-resource explotation and aquaculture were emphasized over other categories less salient to project participants. These interviews and oral histories supplement and provide depth to consultations from government agencies and community organizations that may provide brief responses, reviews and/or referrals gathered via phone, email and occasionally face–to–face commentary.

2.2.3.1 In-depth Interviews and Oral Histories

Interviews were conducted initially at a place of the study participant's choosing (usually at the participant's home or at a public meeting place) and/or—whenever feasible—during site visits to the project area. Generally, CSH's preference is to interview a participant individually or in small groups (two–four); occasionally participants are interviewed in focus groups (six–eight). Following the consent protocol outlined above, interviews may be recorded on tape and in handwritten notes, and the participant photographed. The interview typically lasts one to four hours, and records the "who, what, when and where" of the interview. In addition to questions outlined above, the interviewee is asked to provided biographical information (e.g., connection to the study area, genealogy, professional and volunteer affiliations, etc.).

2.2.3.2 Field Interviews

Field interviews are conducted with individuals or in focus groups comprised of with *kūpuna* and *kama'āina* who have a similar experience or background (e.g., the members of an area club, elders, fishermen, *hula* dancers) who are physically able and interested in visiting the project area. In some cases, field visits are preceded with an off-site interview to gather basic biographical, affiliation and other information about the participant. Initially, CSH researchers usually visit the project area to become familiar with the land and recognized (or potential) cultural places and historic properties in preparation for field interviews. All field activities are performed in a manner so as to minimize impact to the natural and cultural environment in the project area. Where appropriate, Hawaiian protocol may be used before going on to the study area and may include the offering of *ho'okupu* (offering, gift), *pule* (prayer) and *oli*. All participants on field visits are asked to respect the integrity of natural and cultural features of the landscape and not remove any cultural artifacts or other resources from the area.

Building on open-ended and semi-structured approaches, field interviews included the structured methods enumerated in the above section. For example, for the community resource map (see Figure 19): participants surveyed the project area with the researcher/s in order to identify significant cultural and natural features of the landscape. If the participant was comfortable sharing the location of resources; they were geo–referenced using GPS and included on the cultural resource map. If the participant preferred to keep the location private or to only identify its general location, the specific location was *not* recorded.

2.2.4 Protection of Sensitive Information

It is sometimes the case that participants in cultural studies agree to contribute their comments or be interviewed for a study on the condition that their names are withheld from the report. Their reasons for doing so vary from concern about protecting the identity of resource collectors and/or revealing the precise location of certain natural and cultural resources to opposition to the proposed project. For the interviewee who agrees to participate on the condition that his/her name is withheld from public disclosure, CSH takes all precautions to make sure his/her contribution remains confidential. The confidentiality of subjects is maintained via protected files. For this reason, CIA reports sometimes include a subsection of Summaries of Kama'āina "Talk-Story" Interviews entitled, Additional Statements.

2.3 Compensation and Contributions to Community

Many individuals and communities have generously worked with CSH over the years to identify and document the rich natural and cultural resources of these islands for cultural impact, ethno–historical and, more recently, Traditional Cultural Properties (TCP) studies. CSH makes every effort to provide some form of compensation to individuals and communities who contribute to cultural studies. This is done in a variety of ways: individual interview participants are compensated for their time in the form of a small honorarium and/or other *makana* (gift); community organization representatives (who may not be allowed to receive a gift) are asked if they would like a donation to a Hawaiian charter school or nonprofit of their choice to be made anonymously or in the name of the individual or organization participating in the study; contributors are provided their transcripts, interview summaries, photographs and—when possible—a copy of the CIA report; CSH is working to identify a public repository for all cultural studies that will allow easy access to current and past reports; CSH staff do volunteer work for community initiatives that serve to preserve and protect historic and cultural resources (for example in, Lāna'i and Kaho'olawe). Generally our goal is to provide educational opportunities to students through internships, share our knowledge of historic preservation and cultural resources and the State and Federal laws that guide the historic preservation process, and through involvement in an ongoing working group of public and private stakeholders collaborating to improve and strengthen the Chapter 343 environmental review process..

Section 3 Traditional Background

3.1 Place Names

Place names discussed in the following section were compiled using Lloyd Soehren's "Hawaiian Place Names" database on the internet (http//www.ulukau.org), from historic maps, and from place name texts (Pukui et al. 1974; Clark 1977; Thrum 1922). The definitive source for Hawaiian place names is *Place Names of Hawai'i*, by Mary Kawena Pukui, Samuel Elbert, and Esther Mo'okini (Pukui et al. 1974). Their translations are based not only on literal, phonetic translations of the words, but also on documents and oral history from families in each area. John Clark (1977) has many coastal names in his book, *The Beaches of O'ahu*, that he gathered from knowledgeable residents of each coastal section. When no meanings for place names are given in Pukui et al. (1974), Lloyd Soehren sometimes translates simple place names based on the *Hawaiian Dictionary* (Pukui and Elbert 1986). Thomas Thrum, noted early history chronicler, published a list of Hawaiian place names in the 1922 edition of Lorrin Andrews' *A Dictionary of the Hawaiian Language*. His translations are based on literal, phonetic translations of the words only, with no background written or oral history testimony. Hawaiian words can be translated in a variety of ways, depending on the correct pronunciation. Commenting on Thrum's work, Mary Pukui (Pukui et al. 1974:235-236) cautioned that Thrum's translations were sometimes "unreliable" and "questionable." His place name meanings (attributed to him) will be presented here only when no other source is available. Translations presented without attribution in this subsection are from Pukui et al. (1974), unless otherwise indicated. The general locations of place names, when known, have been plotted on Figure 5.

3.1.1 Place Names of Wai'anae

Wai'anae extends from the seashore on the *makai* side to the top of the Ko'olau Mountain Range on the *mauka* side. The mountain range separates Wai'anae on the leeward side of O'ahu from the Waialua District on the north shore of O'ahu and Wai'anae Uka District in central O'ahu. The center of the coastal promontory called **Mauna Lahilahi** ("thin mountain") is the coastal boundary point dividing Wai'anae from Makaha Ahupua'a to the north. This boundary continues upward along **Kamaile'unu** ("the striped *maile* vine") Ridge to central O'ahu. At the *makai* base of this ridge was a spring called **Keke'o** (Chamberlain 1826, cited in McAllister 1933:114), or **Ka'aipueo,** and a coconut grove; in historic times this was called the village of **Kamaile** ("the *maile* vine").

Along the ridge separating Wai'anae and Makaha are several named *pu'u*, or peaks: **Pu'u Kepauala**; a peak at 3220 ft., which may be a boundary point called **Pu'u Kūmaipō** ("Kū from the night") mentioned in Boundary Commission Testimony (see Soehren 2009); and **Pu'u Kawiwi**. The northern point of Wai'anae is at **Ka'ala** (possibly "laughter" or "the path") at 4020 ft. amsl, the highest mountain on O'ahu. The northeastern boundary of Wai'anae is separated from the Wai'anae Uka District by the Wai'anae Mountain Range, with the peaks **Pu'u Kalena** ("the lazy one") and **Pu'u Kūmakali'i** For the division between Wai'anae and Lualualei Ahupua'a to the south, the boundary line follows a ridge called **Pāhe'ehe'e** ("slippery"). On this ridge are the peaks **Kaua'ōpu'u** (possibly "swelling battle," Thrum 1922:646), **Mauna Kūwale**

("mountain standing alone") and **Pu'u Pāhe'ehe'e** ("slippery hill") at the *makai* end of the ridge of the same name. The ridge may have been named this for an ancient *hōlua* slide that once extended from the *makai* end of the ridge towards the shore. The eastern edge of the coastal promontory called **Kāne'īlio** (dog Kāne) is the coastal point on the boundary of Wai'anae / Lualualei.

In the *mauka* interior Wai'anae section, there is a peak called **Pu'u Kōleali'ili'i**, which means "small plover." The Pacific Golden Plover (*Pluvialis dominica*) is a migratory bird that nests in inland areas of the island; the Hawaiians were fond of the meat of this bird and travelled into the uplands to catch the nesting birds. The name of this hill may indicate that this is an area where plovers were trapped. Below this hill was a *pali*, or cliff, called **Ka'oniapuhi** ("the writhing eel"), with wavy scars that reminded the Hawaiians of the movement of a *puhi*, or eel. Near the coast was a hill on the plain called **Pu'u Kāhea** ("calling hill"); three *heiau* were built on top or at the base of this hill.

The boundary line between Wai'anae and Makaha runs along a center line that splits Mauna Lahilahi promontory, from a coastal point called **Keawaiki** ("the small bay"). On the south side of the promontory was a shoreline area called **Laulauwa'a** ("the canoe paddle blade," Clark 1977:89). At the eastern end of the *ahupua'a* is a bay, traditionally called **Mā'alaea.** Stretching along the shoreline of the bay was a large coconut (*niu*) grove called **Ka Ulu Niu of Pōka'ī**. In historic times, the name **Pōka'ī** ("night [of] the supreme one") began to be used for the bay itself, and the original name, Mā'alaea, was abandoned. The bay ends at Kāne'īlio Point; at the *mauka* end of the point was an ancient fishing village called **Nene'u**, a shortened version of the word, *nenelu*, meaning "marshy, swampy" (Pukui and Elbert 1986:265). In historic times, this expanded and grew into the modern town of Wai'anae.

The *ahupua'a* is watered by one large drainage system, now called the Wai'anae River. In ancient times, each section and tributary was given its own name, only a few of which can be found on historic and modern maps. Two tributary streams in the northeastern sections are called **Kānewai** ("water of Kāne) and **Kūkahi** ("standing along" possibly, Thrum 1922:653); these merge to form the Honua Stream. In the northeastern uplands, the streams called **Pūnana'ula**, **Kūmuipō** ("Kū from the night"), **Hiu** ("throw violently"), **Honua** ("land"), and **Kaua'ōpu'u** (possibly "swelling battle," Thrum 1922:646), all flow and join to form the **Kaupuni** Stream ("place around") at a point west of the peak Kaua'ōpu'u. **Kawiwi** Stream drains the western section of the *ahupua'a* and joins with Kaupuni Stream near the coast. Traditionally the stream section near the coast was called **Puehu** ("scattered"), which emptied into the sea at an inlet also called Puehu. Other names for this stream were **Keaupuni** ("the government or nation"; Pukui and Elbert 1986) and **Kānepūniu** (Clark 1977:87). There was once one small watercourse, usually dry, at the eastern end of Laulauwa'a, now called Mauna Lahilahi Beach Park, called **'Eku**, which means "to root, as does a pig" (Clark 1977:90).

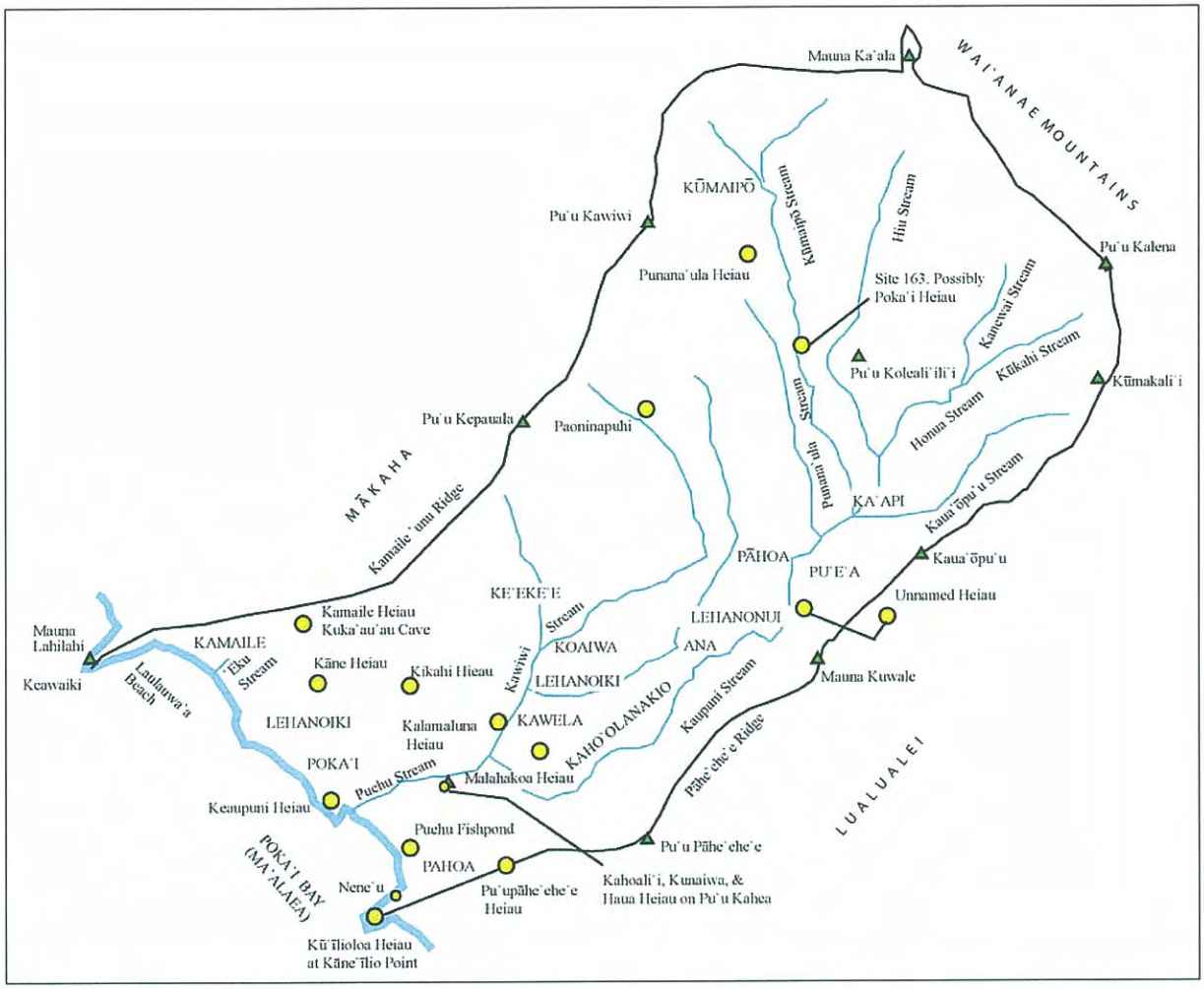


Figure 5. Place Names of Wai'anae (base map U.S. War Department 1919 Fire Control map, Wai'anae Quad)

3.1.2 Traditional Hawaiian Land ('Ili) Names

Wai'anae Ahupua'a was once divided into a number of smaller land divisions, called *'ili*. Table 1 lists the known *'ili* names and possible meanings. The known locations of the *'ili* were placed on Figure 5, based on a map in *An Ancient History of Wai'anae* (Cordy 2002a:48-49).

Table 1. *'Ili* Land Division Names and Meanings

'Ili Name	Meaning	Source
Ana/'Ana	cave, or pumice	Soehren 2009, Pukui and Elbert 1986
Haakoa/ Ha'akoa	low *koa* tree	Pukui et al. 1974
Halona/ Hālona	peering place	Pukui et al. 1974
Hapuukie/ Hāpu'uki'e	tall tree fern	Soehren 2009, Pukui and Elbert 1986
Iole/'Iole	rat	Soehren 2009, Pukui and Elbert 1986
Kaakaaka/ Ka'aka'aka	the laughter	Soehren 2009, Pukui and Elbert 1986
Kaape/Kaapi/ Ka'ape	taro-like plant	Soehren 2009, Pukui and Elbert 1986
Kahapapa/ Kahāpapa	the rock stratum	Soehren 2009, Pukui and Elbert 1986
Kahoolanakio/ Kaho'olanakio	the buoyant pool	Thrum 1922:638
Kalaia/ Kālai'ā	carve or cut	Pukui and Elbert 1986
Kaloiloa/ Kalo'iloa	the long taro patch	Soehren 2009, Pukui and Elbert 1986
Kamaile	the *maile* vine	Soehren 2009, Pukui and Elbert 1986
Kaupakumoa		
Kealalua		
Keekee/ Ke'eke'e	crooked	Soehren 2009, Pukui and Elbert 1986
Kuaiwa		
Kualele	short for *akua lele*	Soehren 2009, Pukui and Elbert 1986
Kukuilaukahuli		
Kumaipo/ Kūmaipō	Kū from the night	Pukui et al. 1974
Lehanoiki	faint voice	Thrum 1922:656
Lehanonui	loud voice	Thrum 1922:656
Leleakoae/ Leleakoa'e	flight of the tropic or boatswain bird	Pukui and Elbert 1986
Moomoku/ Mo'omoku	cut-off land section	Pukui et al. 1974
Pahoa/ Pāhoa	dagger	Soehren 2009, Pukui and Elbert 1986

Papa/ Pāpā	flat, or forbidden	Soehren 2009, Pukui and Elbert 1986
Pohakoi/ Pōhāko'i/ Pōhākō'ī	firm rock or obstruction	Soehren 2009, Pukui and Elbert 1986
Puea/ Pu'e'a	forced to do a thing	Thrum 1922:657

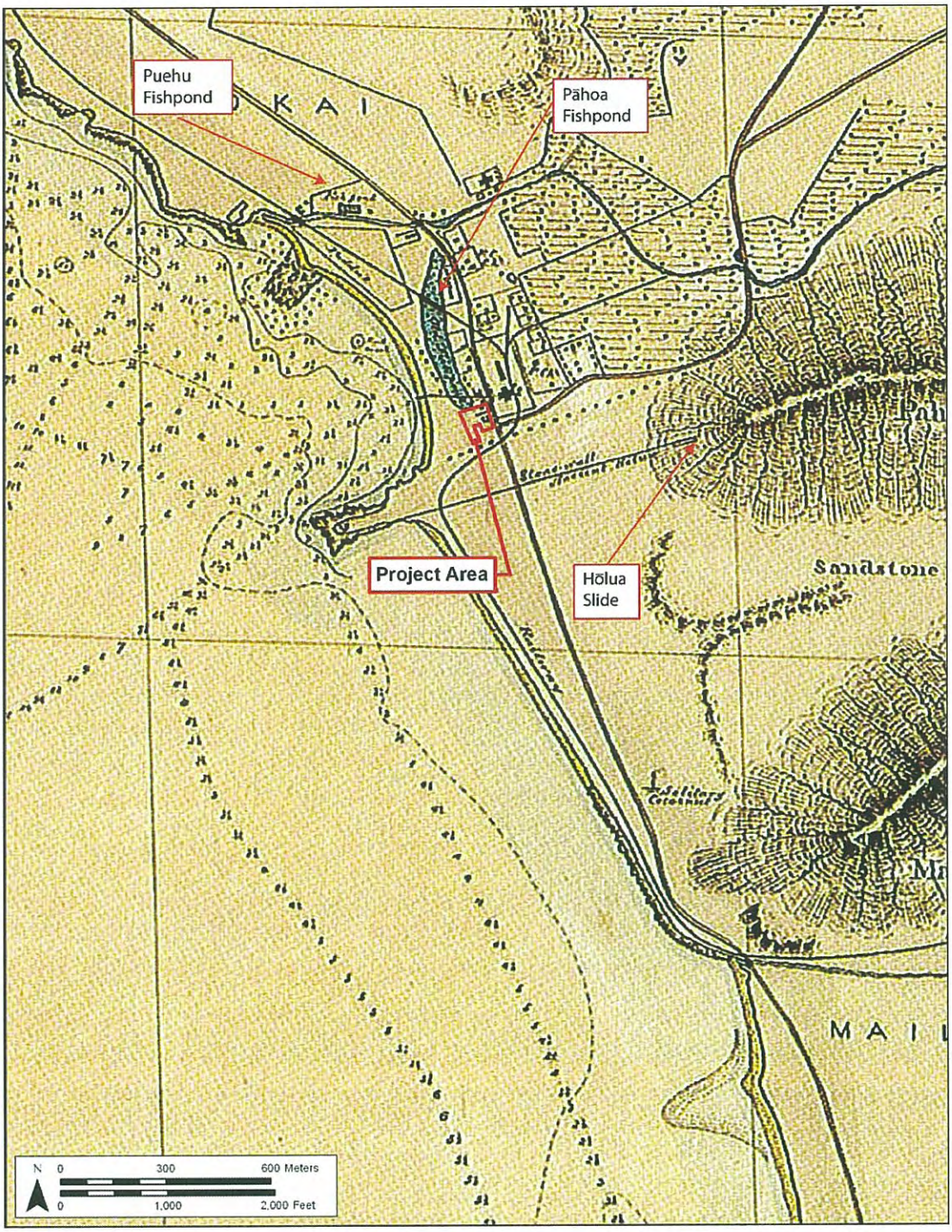


Figure 6. 1884 Hawaiian Government Survey map (portion) of "Waianae and Adjacent Coast" by George E. Gresley Jackson, showing location of fishponds and *hōlua* slide (Hawai'i Land Survey Division, Registered Map No. 1348)

3.2 Loko (Fishponds)

There are two named fish ponds (*loko*) within the *'ili* of Pāhoa, **Loko Puehu** and **Loko Lopoko**, both are shown on an 1884 map of the Wai'anae Coast by George Jackson.

Puehu Fishpond was described in some detail by McAllister. He located the pond (Site 154) just west of the mouth of the Wai'anae Stream and on the north end of Pōka'ī Bay (see Figure 5).

> Site 154. ...Puehu pond is said to have once been of great importance. Due to neglect it is greatly overgrown and its extent is not clearly defined. Its original area was probably 300 by 75 feet...25 feet from the stream [Wai'anae Stream]. This pond is about 500 feet from the beach and is not affected by the tides, though the end toward the sea may at one time have been connected with the stream.... (McAllister 1933:113)

One account notes that the pond was almost completely filled in by 1954 (E.S., Feb 1954 in Sterling and Summers 1978:70).

A larger pond, or marsh area, is shown on several historic maps, sometimes labeled "Pahoa." Cordy has noted that these swamps formed naturally along the shoreline:

> During low flow periods, pools often formed behind the dunes which blocked the streams, and sometimes overflow would back up lineally behind the dunes, forming long narrow swamplands. (Cordy 2002a:8)

Land Commission testimony from the mid-nineteenth century Māhele (taken from Waihona 'Āina Database, 2008) shows that this is instead a pond named Lopoko in the *'ili* of Pāhoa.

LCA 3091 Kuaana described his claim for his *hale*, or house lot:

> The claim for my houses is at Unuiki and is bounded on the north by the houses of Kahonu, on the east by the pond, on the south by the houses of Kauakahi, on the west by the sea. That is my claim for land and house, which are my own, from Kaapuiki (No. 3091, Kuaana, Wai'anae, January 8, 1848, N.R. 46-47v4).

Akaloa, sworn, supported the claim for Kuaana's *kahuahale* (house complex), locating the fish pond on the *mauka* edge of his lot,

> Apana 2, Kahuahale, bounded:
> Mauka by the loko Lopoko
> Ewa by the house of Kauakahi
> Makai by the sea shore
> Waialua by the house of Kahi.
>
> Claimant has received his land from Kaapuiki in the time of Liliha and has held it in quiet until now. (Akaloa, F.T. 310v9, No. 3091)

Kapepe, also swore to the truth of Akaloa's testimony. After the death of Kuaana [1849], his widow Kamakalauhiwa came to prosecute the claim and Akaloa again gave testimony, this time with Kapela bolstering his testimony. The pond is in the same location, just *mauka* of the lot, but it is referred to as Leepoko.

> ...A house site is in the second section...
>
> Section 2:
> Mauka, Leepoko pond.
> Ewa, Kanakahi's house
> Makai, beaches
> Waianae, Kahi's house. (Akaloa, N.T. 426v9)

The testimony of the boundary between the *ahupua'a* and the *'ili* of Pāhoa clarifies the proper names:

> Nahinu, sworn, says the ili of Pahoa is but small. The loko, makai belongs to this ili. The boundary of the piece in dispute runs along to the eastward of an enclosure belonging to Kaapuiki, and up through the coconut grove and along a stone wall to some hau trees, and then up mauka and across to the east corner of the land, and from thence running makai to the loko.
>
> This ili consists of three pieces, first, the fish pond; second, the piece which I have tried to describe...
>
> Kulepe, sworn, says, "Pahoa" consists of two pieces; the fish pond forming the part of the mauka piece. I have lived here about 15 years... In 1850, the boundaries of the makai piece of "Pahoa" were pointed out to me by three kamaainas, who are now all dead... About 1841. I restored a lihi of "Pahoa," which lies between the fishpond and the stone wall, and was claimed for "Pahoa," on account of some coconut trees. This was the only lihi [boundary] of "Pahoa" restored by me. The people who formerly lived on the land now in dispute used to do konohiki [land management] labor for the ahupuaa of "Waianae." (Akaloa, N.T. 426v9)

Loko Lopoko was likely a larger fishpond that was under *konohiki* stewardship, according to Kulepe's testimony, and was worked by the people living there.

Lopoko Pond would be a *loko pu'uone* or *loko hakuone,* an isolated shore fishpond usually formed by the development of a barrier beach building a single elongated sand ridge (*pu'uone* or *hakuone*) parallel to the coast.

In 1869, Samuel Kamakau described the *loko pu'uone:*

> The *pu'uone* ponds near the sea (*loko kai pu'uone*) were much desired by farmers, and these ponds they stocked (*ho'oholo*) with fish. *Pu'uone* ponds were close to shore ponds, *loko kuapa,* or to the seashore, and next to the mouths (*nuku*) of streams. The farmer cleared away the *mokae* sedges, *'aka'akai* bulrushes, and the

> weeds, and deepened the pond, piling up the muck on the sides, until he had a clean pond. Then he stocked it with *awa* and fish fry, *pua i'a*-two or three gourds full-until the pond was full of fish. After two or three years the fish from the first gourd would have grown to a *ha'ilima* (18 inches) in length. (Kamakau 1976:49)

An archaeological crew (Riford 1984) conducted testing in a pond referred to as Pāhoa pond, which would have been of the *loko pu'uone.* Riford obtained a radiocarbon date of 2,000 years before present (B.P.) from a wood sample within the pond. This supports the interpretation of a stable marshy environment in ancient times. Such large embayments lying behind sandbars would have been ideal places for fishing for the first inhabitants (Borthwick et al. 1999). *'Anae* (mullet) could be picked from the shallows. Relatively little labor could transform such a feature into a weir or holding pond. This was probably done quite early in the history of the site. The success of such ponds may have given rise to the creation of walled fish ponds in later times.

3.3 Mō'elolo (Legends) Concerning Specific Place Names

There are many legends associated with Wai'anae. It was said to have been the birthplace of the demi-god and trickster Māui (Fornander 1917, Vol.IV, Part II:370) and the home of the pig-god Kamapua'a when he settled down to farm. It was often the place where visitors from Kaua'i first landed and a place where travelers all the way from the ancestral lands of Kahiki would first come ashore on the island of O'ahu. The following legends concern those specific place names near the current project area, the *'ili* of Pāhoa, the bay and shoreline called Pōka'ī, and the *heiau* Kū'īlioloa on Kāne'īlio Point.

3.3.1 Pāhoa

For the current project area, the most important *'ili* name is Pāhoa ("dagger"), in which the Wai'anae Police Station is located. It was a *lele*, or jump land, a type of land that had one or more non-contiguous sections. In Wai'anae, Pāhoa is shown with three sections on historic maps: the coastal section around Kāne'īlio Point *makai* of the present highway (*makai* of the ancient coastal trail), a small 5.0 acre of land *mauka* of the highway, and a large upland section on the west side of Kaupuni Stream.

Pāhoa means "dagger" and refers to one of the many stories concerning Kamapua'a, the Hawaiian pig god. In explaining the name Pāhoa, Pukui et al. (1974:174) state, " . . . where Kamapua'a was dragged by 'Ōlapana's men; they desisted from butchering him with daggers (*pāhoa*) when Kama's friends said this would damage the body and make it a poor sacrifice."

Expanding on the place name meaning for Pāhoa 'Ili, we find a more detailed account in Fornander (1918, Vol. V, Part II:320-324). The story is set in the time of 'Ōlopana, a chief of windward O'ahu, during his hunt for the famous *kupua* (supernatural being that could change forms), Kamapua'a. Ross Cordy (2002a:19) has estimated the time of 'Ōlapana's rule as *mō'ī* (high king) to approximately A.D. 1340-1360. Lonoaohi, a *kahuna nui* (high priest) of 'Ōlopana was tied and bound for having committed undisclosed transgressions. Before 'Ōlopana left to capture and kill Kamapua'a, it was made known his intent to sacrifice Lonoaohi with the man-pig upon the return of the *mō'ī.* Kamapua'a had been living in the "uplands" of Pāhoa, referring to the inland *lele* of Pāhoa.

Because of his great power of foresight, Lonoaohi knew when Kamapua'a was captured:

> Lonoaohi was able to know the intention of the men who had Kamapuaa in charge, which was this: When the men sought instruments with which to cut the pig open, and let the insides be taken out so as to make carrying much easier. Lonoaohi knew that if Kamapuaa was killed he would be killed also. (Fornander 1918, Vol. V, Part II: 322-323)

Lonoaohi was clever, and told his sons to find the men bearing the pig body of Kamapua'a back to 'Ōlopana. Lonoaohi directed his two children, Kapuaaolomea and Kapuaahiwa:

> ...that the king has sent word by you not to cut the hog [Kamapua'a] open. Let it be as it is till reaching the altar, or the king's victim will be spoiled. There will be all the rest of this day and night until tomorrow by that time the sacrifice of the kind will surely get spoiled. Furthermore, the king has said, that the hog must not be dragged, for his skin will get cut and injured. It must be carried on sticks and when the men get tired put the hog on the ground, that the men may rest. Tell them that this is the wish of the king. (Fornander 1918, Vol. V, Part II: 322-325)

Lonoaohi knew that if he could prolong or save the life of Kamapua'a, his life would also be prolonged or saved. The body of the man-pig was heavy and the men who carried him sought to lighten their burden by gutting Kamapua'a, as most hunters today would do before carrying their hunt back home. It was at this juncture that the children of Lonoaohi arrived:

> When the two men came up to the men at Pahoa, they found them sharpening their wooden daggers (*e hookala ana na pahoa*) and getting ready to cut Kamapua'a open. The sons of Lonoaohi then spoke to the men using the words told them by their father. When the men heard this they gave up their daggers (*halele i na pahoa*). It was because of this fact that this place was called Pahoa and it is so known today. (Fornander 1918, Vol. V, Part II: 324-325)

It is interesting that it is because the *pāhoa* (wooden daggers) were *not* used that this *'ili* was named. It is perhaps noteworthy, because had Lonoaohi not interfered, Kamapua'a would have died at this place. Instead Kamapua'a would go on to escape and ultimately kill 'Ōlopana and claim O'ahu for his own.

In another version, 'Ōlopana's men are joined by the men of Wai'anae to hunt and kill Kamapua'a. The men with *pāhoa* are successful, stabbing and killing the pig, with dire consequences for the people of Wai'anae. Kamapua'a's grandmother intoned a chant for her grandson, which restored Kamapua'a to life. When he came back to life, he devoured all of his captors:

> There were no survivors in this eating by the pig, including King 'Olopana and his commoners. 'The doors of the houses of Wai'anae were closed with the '*aweoweo* fish' during this time. These days were a pathetic, dreadful time. (Kame'eleihiwa 1996:42)

The translator of this legend (Kame'eleihiwa 1996:42) notes that the appearance of schools of the *'āweoweo* fish (*Pricanthus* sp.) near the shore was an omen that royalty would die, and thus, this fish is often associated poetically with death.

In another version, Pāhoa is the name of a large rock in Wai'anae. Kamapua'a had been living near Mount Ka'ala in the uplands of Wai'anae. At night, he would sneak down to the lowland farms, and steal the taro crops from the farmers. One night the farmers caught him:

> ...They caught him, tied his leg with a braided hau rope and tied the other end to a rock named Pahoa. The men went to prepare the imu [underground oven] to cook him in. On the day set for killing the pig they went to get him and found him gone. They looked about and there he was in the taro patches. The rock Pahoa, to which the pig had been tied, had a ridge around it and had become thin. We will now see how the men went into the taro patch to catch the pig. He was caught and taken to Puu-kahea . . .where the imu in which to cook him was. Then the men saw the many supernatural bodies (kinolau) of Kamapuaa drawing near from across the plains and devoured the men of Waianae. Only those who fled escaped. This was how Pahoa, the stone was named in the Kamapuaa legend. (*Hoku o Hawaii*, Feb. 11, 1930, cited in Sterling and Summers 1978:72)

Kamapua'a has a second connection to Wai'anae. As noted in the place name section, there was a watercourse, usually dry, called 'Eku on the eastern side of Mauna Lahilahi. This place means "to root, as does a pig." The name points to the origin of the stream, as Kamapua'a attempted to sneak up on a village (probably Kamaile) by rooting through the ground inland from the shoreline. The villagers heard him however, and beat him back with canoe paddles (Clark 1977:90). Although Clark does not make this explicit connection, it may be why the beach surrounding this stream is called Laulauwa'a, which means "canoe paddle blade."

3.3.2 Pōka'ī

Pōka'ī was originally was the place name for a coconut grove *mauka* of the bay and just east and *'ewa* (towards 'Ewa District) of Wai'anae Stream, where the Mormon Church sits today. In Sterling and Summers "Sites of O'ahu," Pōka'ī:... is said to be the name of an early voyaging chief from Kahiki, who brought and planted there the coconut from which has sprung its grove, famed in song (Thrum 1922, cited in Sterling and Summers 1978:70).

Pōka'ī , according to one Kamakau account (1991:105), was of Kahiki, having arrived on the canoe of Mo'ikeha, 'Ōlopana's younger brother. Having been caught in some compromising situations:

> He [Mo'ikeha] was severely criticized, and so he went off to sea. He took with him his followers Moa'ula, Pāha'a, La'a-maomao, Mō'eke, Kaunalewa, and some others [Pōka'ī].

As the *wa'a* (canoe) journeyed along the *pae 'āina* (island group) of Hawai'i, Mo'ikeha's various companions departed to reside among the people of these lands. It was the same with Pōka'ī, who was one of the first from this voyage to settle on O'ahu Island before Mo'ikeha and

his remaining companions sailed on to Puna Wai-mahana-lua in Kapa'a on the island of Kaua'i (Kamakau 1991:106):

> Pōka'ī and Mō'eke remained on O'ahu in Wai'anae—in Wai'anae of the gentle Kaiaulu wind, the sweet waters of 'Eku, the thick poi of Pāhoa, the stingy poi of Lehano and Kūāiwa, the rich poi of Kamaile, and the *aku* fish "tidbits" (*aku nahu pū*) of Wai'anae—in Wai'anae, land beloved of the sun.

The Kaiāulu wind is a gentle trade-wind breeze at Wai'anae, mentioned in song as "*Olu'olu i ka pā a ke Kaiāulu*, cool with the touch of the Kaiāulu" (Pukui and Elbert 1986:115).

A more ancient origin than the time of 'Ōlopana is attributed to the name Pōka'ī by the Hi'iakakapoliopele stories, as told by Ho'oulumāhiehie in the original 1906 Hawaiian language newspaper, *Ka Na'i Aupuni*, as translated by Puakea Nogelmeier (2006:258-260):

> My dear reader, it is said that the name Pōka'ī , which we saw earlier in the thread of the story, is a very recent name, having been given to the coconut grove of Wai'anae after one of Moikeha's men who sailed with him from Tahiti when he left his cousin, 'Ōlopana. That however is not the truth. Pōka'ī is actually an ancient name, from the time of Pele and Hi'iaka.
>
> When Hi'iaka and her party landed, Pōka'ī, the kupua of Wai'anae, joined her and her companions and they greeted one another.

According to Nogelmeier's translation, Pōka'ī then ordered a *lū'au* for Hi'iaka and food for her companions, Lohiau'ipo and Wahine'ōma'o.

> When Hi'iaka and her companions were eating, Pōka'ī said, "That is all that your host has to offer some food and some fish. I have no other gift to present you, Hi'iaka."
>
> To which Hi'iaka responded, "This is quite enough. This is a lot, and you have saved me on my day of hunger. And here is my gift, that you shall dwell in this place until your body quits this earth, and then this land will be known by your name forever. (Nogelmeier 2006:258-260)

Pōka'ī Bay is also famous as a school for priests and astrologers, possibly at the *heiau* of Kū'īlioloa. After the defeat of the O'ahu chiefs by Kamehameha I, many of the native O'ahu chiefs and people lost their land and fled to Wai'anae. Speaking of this, a chronicler noted:

> The kilokolo Hoku or astrologers. To preserve the folk-lore of their homeland, Oahu, the exiled high class priest or kahunas founded a school at Pokai bay for instructing the youth of both sexes in history, astronomy, navigation, and the genealogies of their ancient chiefs and kings; romance and sentiment hovers round Mount Kaala (the mount of Fragrance), and three valleys extending from its western base to the Waianae shore, Makaha, the valley of robbery; Po-kai the valley of the dark sea; Lualualei, the valley of the flexible wreath, is the meaning

> given in Hawaiian dictionaries. (Mouritz 1934, cited in Sterling and Summers 1978:68)

Pōka'ī Bay was also the home of a famous *kupua* who could change from a man into an eel. A Hawaiian couple lived at the head of Wai'anae Valley and would go down to the coast to fish. They were often helped by a handsome youth, named Puhinalo, and they grew so fond of him that they allowed him to marry their beautiful daughter. The daughter soon grew sick and thin, and the parents consulted a *kahuna* from Nānākuli. He divined that the husband was an eel man, and this was causing the girl to waste away. To confirm this, he advised them to look at the man as he slept to see if he had the fins of an eel on his back. This they did, and then the couple devised a plan to kill the evil eel-man. They gathered many of the people of Wai'anae and invited the eel-man to a lu'au, and when he was unwary they cut off his head with an adze and threw it into a large fire at the base of Kawiwi ridge. When they cut off his head, the man turned into an eel, writhing away, while the head jumped out of the fire to reunite with the body. They cut off the head and threw it into the fire several times, but the eel escaped and reformed each time. Finally, they held their adzes against the body so it could not reunite with the head.

> To the old Hawaiians this eel is known as Puhinalo, "the obliterated eel," and the mark on the pali wall is known as Kaoninapuhi, "the writhing eel." There is a place in Pokai Bay which is known as Halapoe or sometimes as Pohaku o Lapalapa, the place in the water where the eel lived. (McAllister 1933:119)

3.3.3 Kū'īlioloa Heiau

Kū'īlioloa is the famed "man-eating dog of Lonokaehu" (Beckwith 1940:347). According to Kamakau (1991:111), Lonoka'eho was a great chief, originally from Kahiki, the Hawaiian ancestral land. He traveled to Hawai'i, bringing Kū'īlioloa with him, and became a chief of windward O'ahu. Ku-long-dog is further described by Beckwith as a dog with a human body and supernatural power, "a great soldier and famous warrior," who terrorized Kahiki.

One account tells of Kū'īlioloa's death at the hands of *ka haole nui, maka olohihi* (the big foreigner with sparkling eyes), that famous *kupua*, Kamapua'a, the Hawaiian pig-god. The dog man was choked from within by *kukae pua'a*, the fern form of Kamapua'a (Beckwith 1940).

Beckwith links Kū'īlioloa to two other *heiau*, one or all three attributed to the *'e'epa* (mysterious gnome-like people):

> The heiau named [Palaa near Kuone at Waialua] is the ancient heiau Ka-pukapuka-akea said to have been built by the Menehune out of kauila wood. The heiau of Lono-a-ke-ahu (Lono-ka-ehu?) at Keehu is said to have "worked with" that of Kapukapu-akea and at Kane-ilio at the lighthouse point stood the heiau of Ku-ilio-loa. (Beckwith 1940:347)

Whether the original builders were the Menehune, travelers from Kahiki, or some *ali'i* (chiefs) from O'ahu Island, the legend of Kū'īlioloa traces its origins back to ancient times as its presence is linked to the legendary times of Hi'iaka and Pele, to the time of 'Ōlopana, and Lonoka'eho.

Mary Pukui says that the legends of this dog have gotten mixed up with other stories of famous dogs. She explains:

> Kū'īlioloa was the name of a legendary dog who was originally known in ancient times as a protector of travelers. Later on, the bad qualities of another dog were transferred to this dog so that he became known as evil which was not true at all. (Mary Kawena Pukui, June 21, 1954, cited in Sterling and Summers 1978:69)

3.4 Subsistence and Settlement

Wai'anae Ahupua'a occupies the central portion of Wai'anae District on the leeward coast of O'ahu. The district originally owed its fame to its multitude of fish and especially for the opportunities for deep-sea fishing from the calm leeward side of Ka'ena Point, where the ocean currents meet. The meaning of Wai'anae, "mullet water," implies an abundance of fish with the word "*'anae*," referring to "full-sized *'ama'ama* mullet fish" (Pukui and Elbert 1986:24). Handy and Handy (1972:468) attribute the naming of Wai'anae to a large fresh water *loko* for mullet called Pueha [sic] (Puehu) located just inland of Pōka'ī Bay. Loko Puehu was a man-made pond dug off from the larger Loko Lupuko, which was subject to tidal action and measured 1600 ftft. by 200 ft. Today Wai'anae maintains its reputation as one of the best fishing locales on O'ahu.

In January of 1778, Captain James Cook sighted Wai'anae from a distance but chose to continue his journey, first landing near Waimea on Kaua'i instead. Eighteen years later Captain George Vancouver approached the coast of Wai'anae from Pu'uloa (Pearl Harbor). Unimpressed by this general view of the Wai'anae coastline, he described it as "one barren, rocky, waste nearly destitute of verdure, cultivation or inhabitants" (Vancouver 1798:355-356). When he sailed past Wai'anae Valley, Vancouver again commented in his log:

> Nearly in the middle of this side of the island is the only village we had seen westward from Opooroah. In its neighbourhood the bases of the mountains retire further from the sea-shore, and the narrow valley, presenting a fertile cultivated aspect, seemed to separate, and wind some distance through the hills. The shore here forms a small sandy bay. On its southern side, between the two high rocky precipices, in a grove of cocoanut and other trees, is situated the village, and in the center of the bay about a mile to the north of the village, is a high rock [Mauna Lahilahi], remarkable for its projecting from a sandy beach. (Vancouver 1798:355-356)

Wai'anae in the 1790s was the center of habitation for the Leeward coast. The valley was well watered and the ocean contained an abundant supply of fish, the lowlands produced *'uala* (sweet potato, *Ipomoea batatas*) and *niu* (coconut tree, *Cocos nucifera*), and the inland valley boasted *kalo* (taro, *Colocasia esculenta*) and *wauke* (*Broussonetia papyrifera*, used for making *kapa*, a bark cloth). The upland forest regions sustained various trees whose wood could be worked into weapons and canoes.

3.5 Burials

In 1999, the current project area was part of a study conducted by Borthwick et al. (1999) for the Pōka'ī Bay Beach Park Expansion and Improvements Project. The 1999 study was divided into four sub-areas for a total of 34 subsurface test units. The current project area was within sub-area 1 of that study and yielded no cultural or historic finds.

Based on archaeological reports in and around the project area, over 32 sets of *iwi kūpuna* (ancestral skeletal remains) were encountered in a ten-year span at the Wai'anae Army Recreation Center (WARC): Kam and Ota (1984) reported two burials; archaeological monitoring (Riford 1984) during sewer line installation at the WARC unearthed five complete sets of *iwi kūpuna.* Hammatt et al. (1985) reported test-unit excavations identifying at least ten individual sets of remains; Schilz (1994) exposed 15 more sets of *iwi kūpuna* during an archaeological data recovery and intensive survey at the WARC.

Mauka of the project area, two archaeological studies were conducted that uncovered *iwi.* Bush and Hammatt (2004) identified one set of human remains in a burial recovery report along Plantation Road across from Wai'anae Elementary School. Kapeliela (1997) documented one burial uncovered at the corner of Lihue Street and Plantation Road.

In 2001, a monitoring plan (Hammatt and Shideler 2001) discussed the inadvertent finds of three coffin burials just north of the police substation, at the corner of Bayview Street and Farrington Highway. Six burials were documented at the Church of Jesus Christ of Latter Day Saints (Borthwick and Hammatt 1997).

The Wai'anae Police substation also borders Farrington Highway, along which other nearby projects have uncovered at least five other sets of *iwi.*

3.6 Heiau

In the early twentieth century, Thomas Thrum presented information on 11 *heiau* in Wai'anae Ahupua'a, mainly based on the memories of long-time residents. Four had been completely destroyed by the time of his research. In the early 1930s, J. Gilbert McAllister conducted a survey of important archaeological sites. One of his tasks was to try to relocate the *heiau* Thrum had recorded some twenty years earlier. McAllister also relied on long-time residents and did not physically visit each site. He relocated some of the sites Thrum listed as still standing or in ruins, noting that some *heiau* had been destroyed after 1909 when Thrum completed his O'ahu *heiau* list. McAllister recorded new information on *heiau* that Thrum did not discuss, but was not able to relocate all of Thrum's *heiau.* McAllister provided detailed descriptions and made field sketches of those *heiau* with significant remnants. The information on a total of 16 *heiau* for Wai'anae Ahupua'a is listed in Table 2 below. The locations are shown on Figure 5. Expanded settlement throughout the *ahupua'a* during the pre-Contact period has also presented itself in the number and variety of *heiau* in Wai'anae. Sites were recorded during the first investigation of Wai'anae during the 1930s. McAllister (1933) noted 16 sites within the *ahupua'a,* including ten *heiau* (seven of which had been recorded as destroyed), the Puehu Fishpond, the Kawiwi fortress, and several house sites (see Figure 5). The sites extend well *mauka* into lands adjacent to streams at the head of Wai'anae Valley.

Table 2. Wai'anae Ahupa'a Heiau

Heiau	*Meaning*	Thrum (1907)	McAllister (1933)
Hā'ena	red hot	Thrum 1909:42; not located	Unlocated Site 10 (McAllister 1933:197)
Haua	rain trough		Probably part of Site 156, heiau on Pu'u Kāhea (Sterling and Summers 1978:71)
Kahoali'i	the companion of a chief	Entirely destroyed	Site 156; listed as destroyed; natives pointed out site as Mr. Brecht's barn
Kalamaluna			Site 159; approximate location pointed out in a cane field
Kamaile	the maile vine	Still standing	Site 161; provides detailed description with plan and oblique views
Kāne	Kāne, the god	Destroyed	Site 160; listed as destroyed
Keaupuni	government, kingdom, nation		Site 155; destroyed before 1933 when Dowsett house built
Kīkahi		Destroyed	Site 158; listed as destroyed
Kū'īlioloa	long dog Kū	In ruins	Site 153; described in detail with plan and oblique view
Kūma'i'awa	sterile Kū, perhaps		Site 14 not found; McAllister 1933:197
Kunaiwa			Probably part of Site 156, heiau on Pu'u Kāhea; name from Cordy 2002a
Malaikahoa		Foundation only	Site 157; relocated foundation; workers believed it was a Hawaiian cemetery
Papa'ena'ena		Walls only	Unlocated Site 12 (McAllister 1933:197)
Pōka'ī	night [of[the supreme one	In ruins	Unlocated Site 11 (McAllister 1933:197). McAllister suggests Site 163 may be remains of this heiau
Pūnana'ula		In ruins	Site 165; still standing; McAllister provides a description
Pu'upāhe'ehe'e	slippery	In ruins; Japanese Cemetery	Site 152; destroyed before 1933 due to expansion of Japanese Cemetery

*Place name meanings from Pukui et al. 1974, or Pukui and Elbert 1986

The nineteenth-century Hawaiian historian Samuel Kamakau recorded a wealth of oral traditions, some that associated Wai'anae *heiau* with prominent *ali'i,* as mentioned previously. Locals of Wai'anae referred to the presence and importance of the *heiau* at Kāne'īlio Point, Kū'īlioloa Heiau being situated prominently at the most *makai* end of this jutting landmass.

The abundance of *heiau* recorded within Wai'anae Ahupua'a is evidence of its fertility for cultivation and its religious and political centrality within the district as well as its association with the *ali'i. Heiau* in the area of Wai'anae Ahupua'a included: Kū'īlioloa Heiau on the coast at Kāne'īlio Point; Pu'upāhe'ehe'e Heiau on Pāhe'ehe'e Ridge; Keaupuni Heiau, which was destroyed and where the Dowsett hotel was built (McAllister 1933:114); Kamohoali'i/Kahoali'i Heiau at Pu'u Kāhea; Kunaiwa Heiau on Pu'u Kāhea; Haua Heiau on Pu'u Kāhea; Kamaile Heiau at the base of Kamaile'unu Ridge; Kāne i Kapua Lena Heiau; Kikahi Heiau; Kalamaluna Heiau; Malahakoa Heiau; Punana'ula Heiau; and, two other unknown named *heiau* in the upper valley of Wai'anae.

Section 4 Historic Background

4.1 Pre-Contact to 1800

The Hawaiian traditions centered on Wai'anae emphasize the area's significance and association with the *ali'i* in prehistoric times. The *moku* of Wai'anae is a focus in the mythological cycles of Māui, Kamapua'a, and Kamohoali'i. The demigod Māui and his brothers were said to have been born in Wai'anae, and it was here that Māui learned the secret of making fire for mankind. Kamakau (1870) enumerates, among the famous locales in Wai'anae, the cave in which Hina (moon goddess and mother of Māui) made her tapa; the fishhook, Manaia Kalani (with which Māui attempted to unite the Hawaiian Islands); the snare for catching the sun (which Māui used to his advantage by capturing the sun on Haleakalā); and the place where Māui's adzes were made. The pig demi-god, Kamapua'a, battled with the giant man-dog Kū-'īlio-loa (after whom the *heiau* in Wai'anae is named) and raised the taro patches of Wai'anae Valley. The people caught him, tied him up, and were preparing to sacrifice him when his many supernatural bodies swept over the plains, devouring the men of Wai'anae and sending them fleeing in terror. Pele's older and favorite brother, Kamohoali'i, the shark god, became enamored with a maiden of the Wai'anae coast and begot a half-man/half-shark child, who devoured many people before being captured and killed.

The earliest permanent habitation of the district most likely was in Wai'anae Ahupua'a along Kaupuni Stream. In an archaeological study of Mākaha, the *ahupua'a* immediately adjacent to Wai'anae to the north, Roger Green expands upon the early observations of Vancouver:

> ...on the coast around the stream at the mouth of the Wai'anae-kai Valley where the foreign chief from Kahiki planted the first coconut of the famous grove. That area, with its well-watered valley behind, would have been the most favored locality in the district. (Green 1980:72)

Archaeological investigations at Pōka'ī Bay have processed dates for occupation of the area back to at least as early as A. D. 1300s. During monitoring of sewer and waterline excavations at the WARC (Riford 1984), five articulated human burials were recovered and a charcoal sample from the prehistoric cultural layer (Layer V) yielded a radiocarbon age of A.D. 1376 +/-50 (C13 adjusted). Further study at the Wai'anae Army Recreation Center (Hammatt et al. 1985) encountered additional burials; testing of a sample from a pit feature yielded a radiocarbon date of A.D. 1340 +/-70. Hammatt notes:

> The archaeological assemblage points to the heavy use of the site as a communal area for fishing preparation, canoe landing and return. The site was the focus of beach access for the inhabitants of Wai'anae-Kai as well as occasional informal sand burial from at least 1300 A.D. onwards. (Hammatt et al. 1985:i)

Inland of Pōka'ī Bay, charcoal samples from a complex of possible taro *lo'i* were dated back to A.D. 1170-1430, 1270-1480, and 1299-1510 (Shapiro and Rosendahl 1988:32). The aggregate of dates suggests permanent habitation of lower Wai'anae Ahupua'a by the late 1100s.

The number of *heiau* recorded within Wai'anae Ahupua'a indicates a large population, the political centrality of this *ahupua'a* within the *moku*, and Wai'anae's association with the *ali'i* during the pre-Contact period. The pioneering nineteenth-century Hawaiian historian, Samuel Kamakau, recorded oral traditions that associated some of the Wai'anae *heiau* with prominent *ali'i*, as in the following two accounts, "At Wai'anae Kahahana restored the heiau of Ka-moho-ali'i..." (Kamakau 1992:134).

> Take the story of Ka-welo when he sailed for Kaua'i to make war. He set a tabu over the heiau at Puehu at Wai'anae, and at the end of the sacrifice ordered that the wood of the *paehumu*, both the fence and the images themselves, be used for firewood for the expedition to Kaua'i. (Kamakau 1992:203)

The latter eighteenth century also saw the involvement of Wai'anae Ahupua'a and its population in the political changes impelled by the struggle between *ali'i* from other islands for political control and conquest of O'ahu. The *luakini heiau* (sacrificial *heiau*) at Pu'u Kāhea was the domain of Ka'opulupulu, a prophet and *kahuna nui* during the time of Kahahana, the *mō'ī* (king or ruler) of the O'ahu Kingdom in the 1780s. Ka'opulupulu held sway from the Wai'anae coast to Pu'u o Mahuka in Waimea. Kahahana was known as a cruel ruler, having been raised in the court of his uncle, Kahekili, *mō'ī* of Maui. Kahahana was courted by Kahekili to grant him favor by bestowing the *ahupua'a* of Kualoa to Kehekili. Ka'opulupulu refused to allow the loss of Kualoa to the Maui king, arguing that

> ... it was a virtual surrender of the sovereignty and independence of O'ahu, Kualoa being one of the most sacred places on the island ... it would be wrong in him [Kahahana] to cede to another [Kahekili] the national emblems of sovereignty and independence. (Sterling and Summers 1978:177)

Blind to Ka'opulupulu's warnings, and subjected to the manipulations of his uncle Kahekili, Kahahana was tricked into thinking his *kahuna nui* tried to betray him. It was in Wai'anae that Kahahana's deception led to the *mō'ī*'s betrayal of Ka'opulupulu. Upon his capture at Pu'u Kāhea, in Wai'anae, he cried out to his son, Kahulupue, the prophecy, "Take a deep breath, my son, and let the sea touch your skin, for the land shall belong to the sea (that is, to those coming over the sea)" (Green and Pukui 1936, in Sterling and Summers 1978:71).

This prophecy foretold the loss of the land to foreigners from across the sea, which came to pass less than a century later. Ka'opulupulu was killed. With such a staunch and powerful opponent out of the way, Kahekili invaded and killed the O'ahu king, Kahahana, ushering in a decade of rule over O'ahu by the Maui Kingdom (Cordy 2002a:37-9).

During Kahekili's invasion of O'ahu, ca. 1783, he vanquished the O'ahu chiefs in a series of battles that culminated in Wai'anae:

> Pupuka [an O'ahu chief] rallied the retainers of the chiefs of Kona, 'Ewa, Wai'anae, Waialua, and Ko'olau at Kawiwi, a stronghold between Wai'anae and Mākaha, where many died of starvation or were flung over the precipice because of famine, and many perished. (Kamakau 1992:139-140)

In 1794, Ka'eokūlani recruited the "warriors of Waialua and Wai'anae" to make war on his nephew Kalanikūpule, then ruler of O'ahu (Kamakau 1992:168). By December 1794, Ka'eokūlani had been killed and his forces were defeated. Kalanikūpule would himself be deposed the following year when the invading Hawai'i Island forces of Kamehameha prevailed at the Battle of Nu'uanu in April 1795. Wai'anae itself was not the site of any major conflicts associated with Kamehameha's conquest of O'ahu, but traditional records designate it as a refuge to large numbers of O'ahu residents, who resettled after fleeing from the Hawai'i Island invaders.

In 1796, Kamehameha would himself come to Wai'anae where his fleet of eighty double canoes stopped on their way to invade Kaua'i. "The fleet went on to Wai'anae and the war god [Kū-kaili-moku] was carried ashore that evening" (Kamakau 1992:173). Kamakau records that the fleet departed Wai'anae before midnight, but returned to Wai'anae to gain shelter after advance canoes encountering a strong wind called Kulepe and capsized. Because of this dissasterous ending of the war expedition to Kaua'I, the whole fleet returned and remained on O'ahu for over a year (Kamakau 1992:173).

4.2 Early 1800s

Trade in sandalwood was the strict monopoly of the *ali'i*, beginning with the rule of Kamehameha. The Hawaiian Islands began exporting sandalwood to China shortly after 1800, and the commerce flourished until the supply of the trees dwindled in the mid-1830s. At the height of the sandalwood boom, Kamehameha was buying foreign ships, including six vessels between 1816 and 1818, to transport his own wood to the Orient (Kuykendall 1965:87).

After Kamehameha's death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the profitable sandalwood trade, resulting in an unrestrained demand on the stocks of the wood and upon the commoners who did the harvesting. By the middle of 1828, the stands of sandalwood above the Wai'anae coast may already have been depleted; significantly, perhaps, Boki Kamauleule (made chief of Wai'anae by Kamehameha monarch and also governor of O'ahu) supervised "collecting Sandalwood to pay [his] debts" (Kuykendall 1965:234).

During the same decades that commercial ventures were forcing changes upon the Hawaiian landscape, western missionary interests were establishing their foothold in the islands. The first company of Christian missionaries came to the Hawaiian Islands in 1820 and, within a single year, had established close ties with the *ali'i.*

Beginning in 1831, Protestant missionaries throughout the Hawaiian Islands took censuses of the native population, thus providing the first documentation of its size after the first decades of western contact. The first census of O'ahu in 1831-1832, for the *ahupua'a* within the Wai'anae District, totaled 1,868 people: 757 adult males, 695 adult females, and 416 children (Schmitt 1973:19). Four years later, in 1835-1836, the total district population had dropped to 1,654 (Schmitt 1973:9).

A sketch made by Hiram Bingham (Figure 7), one of the missionaries who traveled to the area to preach, illustrates the Wai'anae Coast ca.1821 to 1830. It shows Kū'īlioloa Heiau on Kāne'īlio Point in the center, Pāhe'ehe'e Ridge on the right (east), Kamaile'unu Ridge on the left (west), houses in the village of Nene'u (Wai'anae) *mauka* of the point, houses aligned along the coastal

trail next to the Pōka'ī coconut grove, and the village of Kamaile with its own coconut grove on the left side of the sketch.

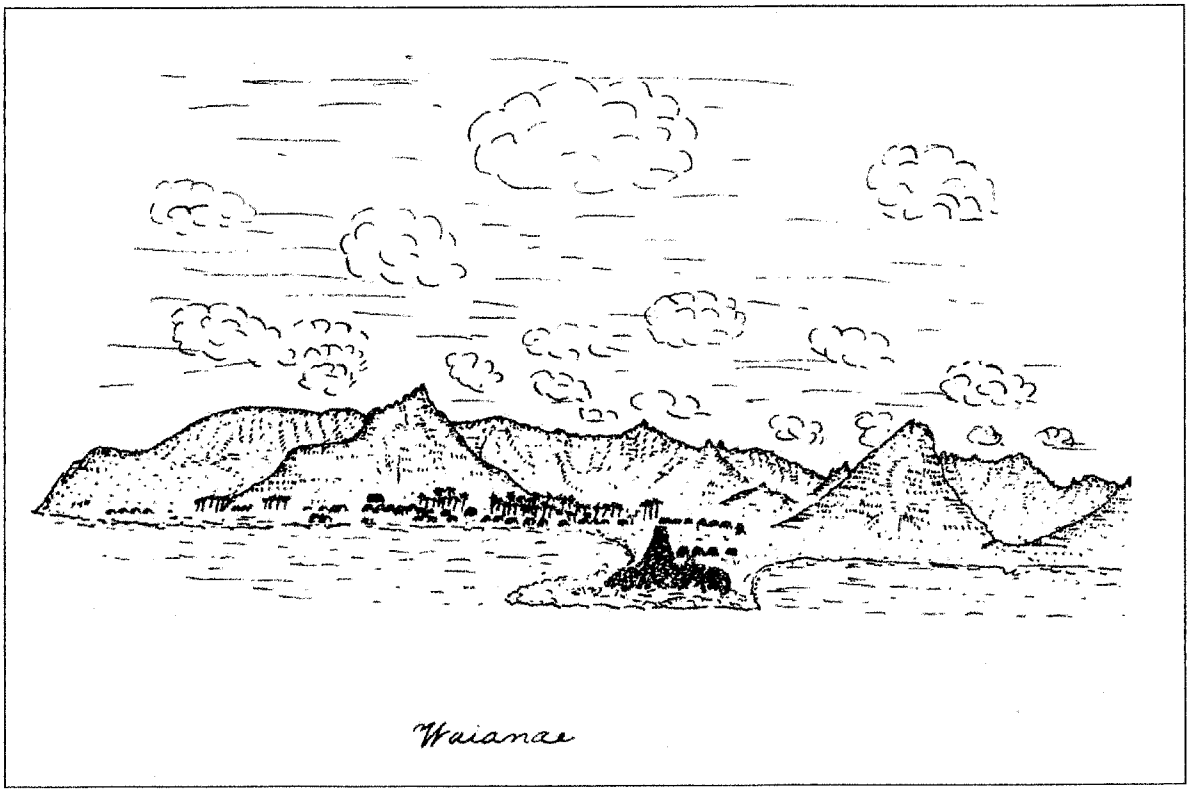


Figure 7. Sketch of the Wai'anae coast ca. 1821-1830, drawn by Rev. Hiram Bingham (Original sketch at Hawaiian Mission Children's Society Library, reprinted in Green 1980:9)

4.2.1 Māhele and Land Commission Award Documentation

The Organic Acts of 1845 and 1846 initiated the process of the Māhele, the division of Hawaiian lands. In 1848 the crown and the *ali'i* received their land titles. During the Māhele, with the exception of the *kuleana* lands, Kamehameha III retained *all* the land in the *ahupua'a* of Wai'anae, Lualualei and Nānākuli as his personal property. These lands were called Crown Lands. As such, the land was under the control of the king, who leased much of it to high chiefs and foreigners for use in ranching. In many cases, commoners were denied access to the land, upland agriculture ended, and traditional life was greatly altered.

Important *'ili* within an *ahupua'a* were also often given to *ali'i* and their retainers. The *'ili* of Pāhoa was awarded to Victoria Kamāmalu as part of the numerous lands given to her as part of Land Commission Award (LCA) 7713. Pāhoa was a *lele*, or jump land, a type of land that had one or more non-contiguous sections. The Boundary Certificate for this *'ili,* describes three parcels: 'Āpana 1, an upland area containing 104.52 acres on the west side of Kaupuni Stream,' Āpana 2, a rectangular area of 4.79 acres *mauka* of the major trail, and Āpana 3, a fishpond of 10.24 acres, *makai* of the highway. The upland land would have been the prime agricultural land, with irrigation from Kaupuni Stream. The rectangular section was bounded by a stone wall on the *mauka* side. This boundary line is the same as the *mauka* boundary of Pilila'au Field today, a sports field west of Wai'anae Elementary School, which used to be a part of the Wai'anae Army Recreation Center. It is the last claim, for the fishpond in 'Āpana 3 that is adjacent or overlaps the current project area.

Kuleana Land Commission Awards (LCAs) for individual parcels within the *ahupua'a* of the Hawaiian Islands were subsequently granted in 1850. These awards were presented to tenants – native Hawaiians, naturalized foreigners, non-Hawaiians born in the islands, or long-term resident foreigners – who could prove occupancy on the parcels before 1845. Within the *'ili* of Pāhoa, 21 claims were made and 16 were granted. Most of these were for agricultural lots in the upland *lele* of Pāhoa.

Based on the distribution of awarded land claims there was a concentrated permanent population in the *'ili* of Pāhoa, where the current project area is located. A review of the LCA documentation shows that the project area overlaps, or at the very least bounds three separate LCAs: LCA No. 10585 awarded to Olaelae, No. 3079 awarded to Kanehailua, and No. 3072 awarded to Kaialiilii (see Table 3 and Figure 8). In this section, relevant quotes from the Māhele documentation are from the Waihona 'Āina Database (2008).

One of the Land Commission Awards granted to Olaelae, bounds the project area *makai*. He received several *'āpana* (lots) in the *ahupua'a* of Wai'anae. Based on the location of his most *makai* parcel and testimony given by himself and Lauhulu, the *'āpana* that the current project area overlaps is most likely the parcel his house lot was on (within his third claim).

Table 3. Land Commission Awards in Vicinity of Project Area, Wai'anae Ahupua'a

LCA #	Claimant	'Ili
843	Punahoa	Pāhoa, Kualele, (*Wailele* in) Lahano[nui]
877	Kaana	Kamaile
3001	Nawahine	Pohakoi, Pāhoa, Kanepuniu
3072*	Kaialiilii, H.A. Wm.	(*Wailele*, a *lo'i kō 'ele* in) Lehanonui, Pāhoa
3076	Kauhiahiwa, G.	Pāhoa, Lehanonui, Kanepuniu, *Wailele*
3079*	Kanehailua	Lehanonui, Pakoa [sic] (Pāhoa?)
3091	Kuaana	(Pohakoi in) Lehanonui, Pāhoa
3276	Waimalu	Pāhoa
7713	Kamāmalu, Victoria	Pāhoa
10585*	Olaelae	(*lo'i kō'ele* named Keoneula and *Wailele*) Lehanonui, Pāhoa

* LCA awards with lands bounding or in immediate proximity to project area, *'ili* of Pāhoa.

Olaelae claimed:

> My third land claim is at Pahoa and it is as follows: on the north is a *kula* [arid land, pasture] and the pig enclosure, on the east is a lo'i ko'ele, named Wailele, on the south is a lo'i ko'ele named Opu, on the west is a lo'i ko'ele named Kauai. Here is my houselot, described as follows: on the north and east, a kula, on the south, a watercourse, on the west a pig enclosure.

In the Foreign Testimony (F. T. 380-381v9) in support of the claim, Lauhulu, sworn, described the boundaries of Section 2-3 as follows:

> Mauka by a Hog sty, ditch [sic]
> Ewa by Waikele moo land
> Makai by Opu koele patch
> Waianae by Kanai's koele patch, ditch.
> Kenai, sworn, he has known in the same way as Lauhulu

Kaialiilii, H.A. Wm. claimed land that was granted in LCA 03072. One *'āpana* was awarded in the *'ili* of Pāhoa, along with another in Wailele in Lehanonui. According to Waihona 'Āina's database (2008) (Award 3072; R.P. 1074; Wailele Lehanonui Waianae; 1 ap.; 1.073 Acs; Pāhoa Waianae; 1 ap.; .348 Ac. (Kaialii for Namuliwai)). Kaialiilii's claim for Lehanonui is for a large *'āpana* with 5 *lo'i* (irrigated patches) and 1 *kula*. However, only one award and 1 *'āpana* was granted in a single LCA. Looking at Figure 8, two separate adjoining parcels make up LCA 3072. We must assume that the claim below, which was given by Kaialiilii, was awarded as one

LCA. However the claim specifies the *'ili* of Lehanonui, which present day maps (see Figure 8) show is far inland of Pāhoa and the actual award. The award parcels are drawn in as two parcels, which perhaps is why there is a discrepancy within the written and mapped awards as to whether one *'āpana* or two were claimed (our information was gathered through Waihona 'Āina Database 2008). A visit to see the award pamphlets in microfiche at the Hawai'i State Archives would clarify this minor confusion).

Kaialiilii claimed:

> To the Honorable Land Commissioners of the Hawaiian Islands, Greetings: I hereby state my claim for land at Lehanonui, Waianae, Island of Oahu. It is bounded on the north by the Government Road, on the east by the land of Kauhiahiwa, on the south by the land of Namuliwai, on the west by the lo'i ko'ele and the kula along the Government Road.

The houselot granted in LCA 03079, *'āpana* 2, to Kanehauilua/Kanehailua appears to be within the boundaries of our project area. Because of discrepancies in old maps, it is adjoining the current project area. Kanehauilua's claim is as follows in the Native Register 40-41v4:

> My house claim is at Pahoa and is bounded on the north by a kula, on the east by the land fence, on the south by the school and the church, on the west by a kula.

Kaapuiki, sworn, supported Kanehailua's claim in Foreign Testimony 278v-2799:

> Apana 2, kahuahake in Paoha [sic]:
> Mauka by the paaina
> Ewa by the kou tree
> Makai by the path in front
> Waianae by the hau of Kanepuniu.
>
> Claimant received the land from me in the time of Kekauluohi and has held it in quiet ever since.
>
> Koaiwa, sworn said, his testimony confirms that of the foregoing as true.

Based on the Foreign and Native Testimony given during the time of the Māhele, records held at the Hawai'i State Archives which we obtained through the Waihona 'Āina Database (2008), a map was put together to show the distribution of land usage around the project area (Figure 9). Loko Lopoko was identified in a claim by Victoria Kamāmalu and described in the same location during the houselot description of the claim by Kuaana.

Based on these archival Māhele documents, the *'ili* of Pāhoa was home to many house lots as well as *kula* and *lo'i*. The project area appears to have overlapping usages, including house lots, dry land agriculture as well as *lo'i;* potentially yielding a rich midden deposit beneath the surface. The proximity of Loko Lopoko to the project area might hint at fishpond deposits beneath the surface as well. The value of accurate radiocarbon dates, midden assemblages or potential pollen core analysis from *lo'i* and fishpond soils are valuable pieces of the past. These

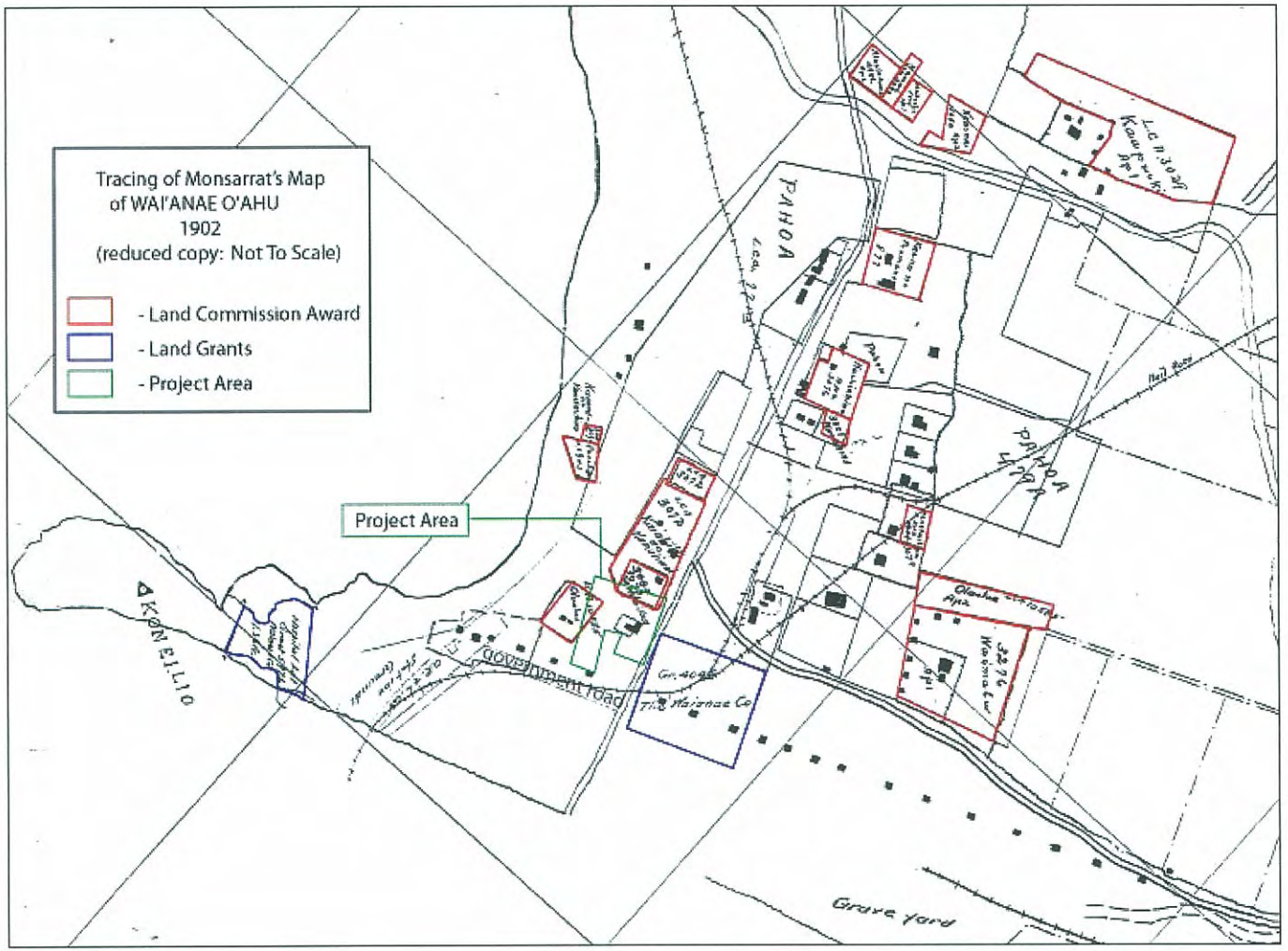


Figure 8. Undated (probably 1875-1900) map of "Waianae, Oahu", by M. D. Monsarrat (map traced in 1902), showing distribution of LCA parcels and land grants (Hawai'i Land Survey Division: Original Map Registered Map No. 600; Traced 1902 map, Registered Map No. 2108)

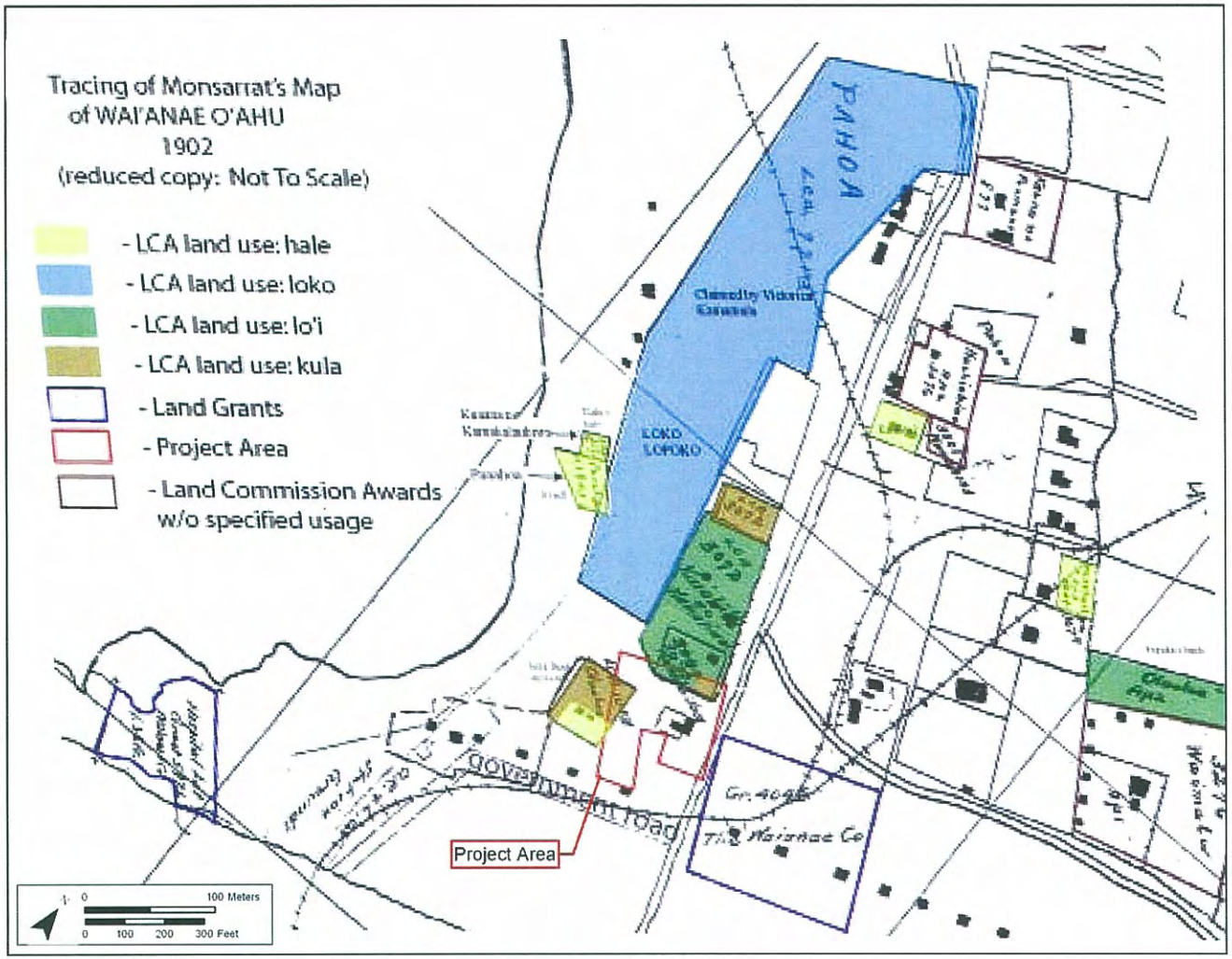


Figure 9. Undated (probably 1875-1900) map of "Waianae, Oahu", by M. D. Monsarrat

remnants of cultural practices not only tie the past to the present, but substantiate and broaden our picture of what the coast of Wai'anae looked like before the upheaval of the land tenure system reform.

4.2.2 Mid- to late-1800s

In October of 1819, two whaling ships had anchored in the Hawaiian Islands. During the next decades, other whale ships would follow, as the islands became a vacationing and layover base in the mid-Pacific. Supplies of beef, fresh and salted, were in demand; and a trade in hide and tallow developed. Following the collapse of the sandalwood trade, the Hawaiian economy had been dependent primarily on supplying whale ships during their long layovers in the islands. The trade sustained the islands until the collapse of the whaling industry in the mid-1860s.

In 1851, Paul F. Manini, son of Don Francisco de Paula Marin, leased 17,000 acres in Lualualei Valley for grazing livestock; by 1863, a missionary reported that most of the land in the Wai'anae District was devoted to grazing and had already been divided "into six or seven divisions; and secured to as many parties or individuals on long lease or fee simple titles" (McGrath et al. 1973:31). The experience of the *maka'āinana* (commoner) in Waialua likely mirrored that of the remaining Hawaiians in Wai'anae:

> ... the depredations of the foreigners' cattle had virtually reduced agriculture to the cultivation of wetland taro. For destruction of sweet potato fields and gardens of melons, bananas, maize, and other crops was causing the people to take these out of cultivation, and in some cases to take themselves out of Waialua. (Kirch and Sahlins 1992:149)

A missionary account in 1863 reported that only a hundred acres were in taro in Wai'anae Valley and that the only items for sale were fish and fungus. Censuses taken during the second half of the nineteenth century record the diminishing population of the Wai'anae District. In 1853 a combined total of 2,451 persons was recorded in the 'Ewa and Wai'anae districts; nineteen years later, in 1872, that total had dropped to 1,671. By 1890, when the districts were recorded separately, the population of Wai'anae had been reduced to 903 (Schmitt 1977:12-13).

Part of that population of 903 in 1890 would have consisted of workers at the then twelve-year old Waianae Plantation. The livestock industry in the islands had reached its peak in the 1870s. At Wai'anae a new venture arose to supplant ranching. In 1878, Hermann A. Widemann, a retired Hawaiian Supreme Court justice, acquired Waianae Plantation, the first sugar plantation on O'ahu. In 1879, he leased most of Wai'anae-Kai (seaward Wai'anae) for 25 years. Between 1878 and 1884, the economy and community of Wai'anae underwent a major change, in which "the former Hawaiian landscape virtually disappeared" (Green 1980:12). Widemann hired 20 local Hawaiians, brought in 15 *haole* (non-native) technicians and around 60 Chinese laborers. He built 24 houses in Wai'anae Valley and a plantation manager's mansion on the site of Haua Heiau. He built a water reservoir and installed 1.2 km of wooden pipe to bring in water from the reservoir to the mill site. A tramway was built from the mill site to the coast where a jetty was constructed (168 m north of Kāne'īlio Point). Part of the track crossed an old fishpond, where piles were driven by hand into the coral. Thus started the sugar boom in Wai'anae (Borthwick et al. 1999; Green 1980).

The results of the sugar boom were the conversion, beginning in 1878, of coastal and central valley garden plots and irrigation systems to large fields of sugarcane, the construction in 1880 of a plantation railway to haul the cane to the mill, and the building, in the former Hawaiian village, not only of the mill itself, but the creation of a whole town to support the processing of cane (Green 1980:12). A 1933 photograph (Figure 10) of the Wai'anae coast shows Kāne'īlio Point in front of Pāhe'ehe'e Ridge to the east, the Wai'anae Co. sugar mill smokestack in the center, and the broad coastal plain behind the mill.

By 1884 Wai'anae Sugar Company had 475 acres under cultivation, nine miles of railroad, and 175 men employed. The 1884 Hawaiian Government survey (see Figure 6) indicates that sugar cultivation had not reached the region of the present study area. In 1890, Wai'anae Sugar Company had 600 acres in cultivation. On July 4, 1895 Wai'anae's isolation was broken when a rail line from Ewa Mill reached the Waianae Sugar Company's track. In 1898, the railway was extended around Ka'ena Point, linking Wai'anae with Waialua on O'ahu's North Shore.

4.2.3 1900s to Present

According to Schilz (1994:23), a business directory of 1900 identified 23 taro planters in the Wai'anae District, but by the 1924 edition, only one was listed. Other Hawaiian traditions remained in practice at Wai'anae into the first decades of the twentieth century; a *kama'āina* (native born) reported: "between 1910 and 1912 there lived in the Wai'anae area about 25 *kahuna* [priest, expert] known (only) to the Hawaiians" (McGrath et al. 1973:84). However, the sugar plantation continued to dominate the landscape. A visitor to the district in 1931 noted in a piece submitted to Thrum's Almanac and Annual:

> The Waianae district may also be reached by modern railway trains which pass over a well-constructed railroad along the entire scenic shore. The trip from Honolulu by either of these means of transportation will take visitors through the bustling little plantation town of Waipahu, through the Ewa cane-growing country to the objective points of Nanakuli, Maile Point, Waianae village, Makaha, Makua, and Kaena Point. . . . The village of Waianae is situated in a valley near a beautiful bay where there is both deep-sea fishing and fishing from the rocks with rod or spear, as well as boating and bathing. This town is located in the center of a large sugar plantation which has an interesting sugar mill. Homesteaders occupy parts of the near-by valleys, where they produce cotton, watermelons, livestock and various other agricultural products. (Thrum 1931:109)

On July 2, 1918, the U.S. army established the Wai'anae Kai Military Reservation by Presidential Executive Order 2900 (Flood et al. 1994:42), as shown on a 1919 U.S. War Department map (Figure 11). During the years of World War II, the Wai'anae area became the site of massive amphibious training operations, training more than 200,000 men at the Wai'anae Kai reservation and surrounding lands. On the 1919 map, residents are clustered around the sugar mill. By the late 1920s, residential areas have expanded across the entire Pōka'ī Bay area (Figure 12).

The sugar plantation never recovered after World War II. On October 17, 1946, the stockholders of American Factors Ltd., which had bought the plantation in 1931, voted to

liquidate, eliminating the economic mainstay of the Wai'anae Coast. Chinn Ho, head of Capital Investment Co., bought the nearly 10,000-acre plantation parcel for $1.25 million in 1947.

> During the late 1940s, Chinn Ho was promoting the establishment of new ventures in Wai'anae. By 1949, [Chinn Ho] was trying to interest dairy operators in farm lots. The manager of a large dairy company in San Francisco turned down an offer of about 450,000 acres of prime sugar land in Wai'anae Valley because "land in Hawaii is going to be much cheaper in the future." The wife of a local dairy operator was concerned about the schools in Wai'anae, but her husband bought the farm anyway. (McGrath et al. 1973:151)

Today, Wai'anae Ahupua'a is occupied by homes, farms, and gardens, as shown on a 1943 and 1950s map (Figure 13 and Figure 14). Wai'anae Valley and its people are engaged in many new projects that perpetuate Hawaiian traditions and culture. These projects range from archaeological field trips to restoring ancient *lo'i* terraces near Mount Ka'ala. Much of Wai'anae Ranch has been preserved due to its proliferation of archaeological sites, and Ka'ala Farms has become a learning center for children and the community with *hale* (traditional houses), working *lo'i,* and access to numerous archaeological sites including *heiau*, terrace systems, and house sites.

4.2.4 Later Developments within the Present Project Area

In 1951, Executive Order No. 8109 (Sept. 24) returned some of the Pōka'ī Bay lands to the Territory of Hawai'i (land claimed in 1918 under Executive Order No.2900 and supported by 1930 Executive Order No.5414). The Governor's Executive Order No. 1901 in Nov 1959 designated these lands as parks under the management of the City and County of Honolulu.

An archaeological inventory survey conducted by Borthwick et al. (1999), adjacent (*makai*) and to the south of the current project area, elaborated on recent activities in the immediate vicinity:

> Additional details concerning Pōka'ī Bay and the project area in modern times were kindly provided by Mr. Tim Pav, a life-long resident of Wai'anae and park keeper at Pōka'ī Bay. Mr. Pav mentioned the tidal wave of 1946 that reached inland past Farrington Highway covering the area with sand. According to Mr. Pav the empty lots within the project area on the east (*mauka*) side of Bayview St. have been abandoned since the 1950s; previously there was a plantation house on that land (a cemented trough remnant is still there). On the west (*makai*) side of Bayview St. were four houses and a night club (formerly a tavern). The houses were demolished (having already been abandoned) about five months ago (i.e. April 1990); the night club had burned down previously. According to Mr. Pav the houses and night club had been built on clay soil and crushed coral fill from a quarry in Ma'īli. The present red-top soil fill was deposited just after the demolition of the buildings. (Borthwick et al. 1999:10)

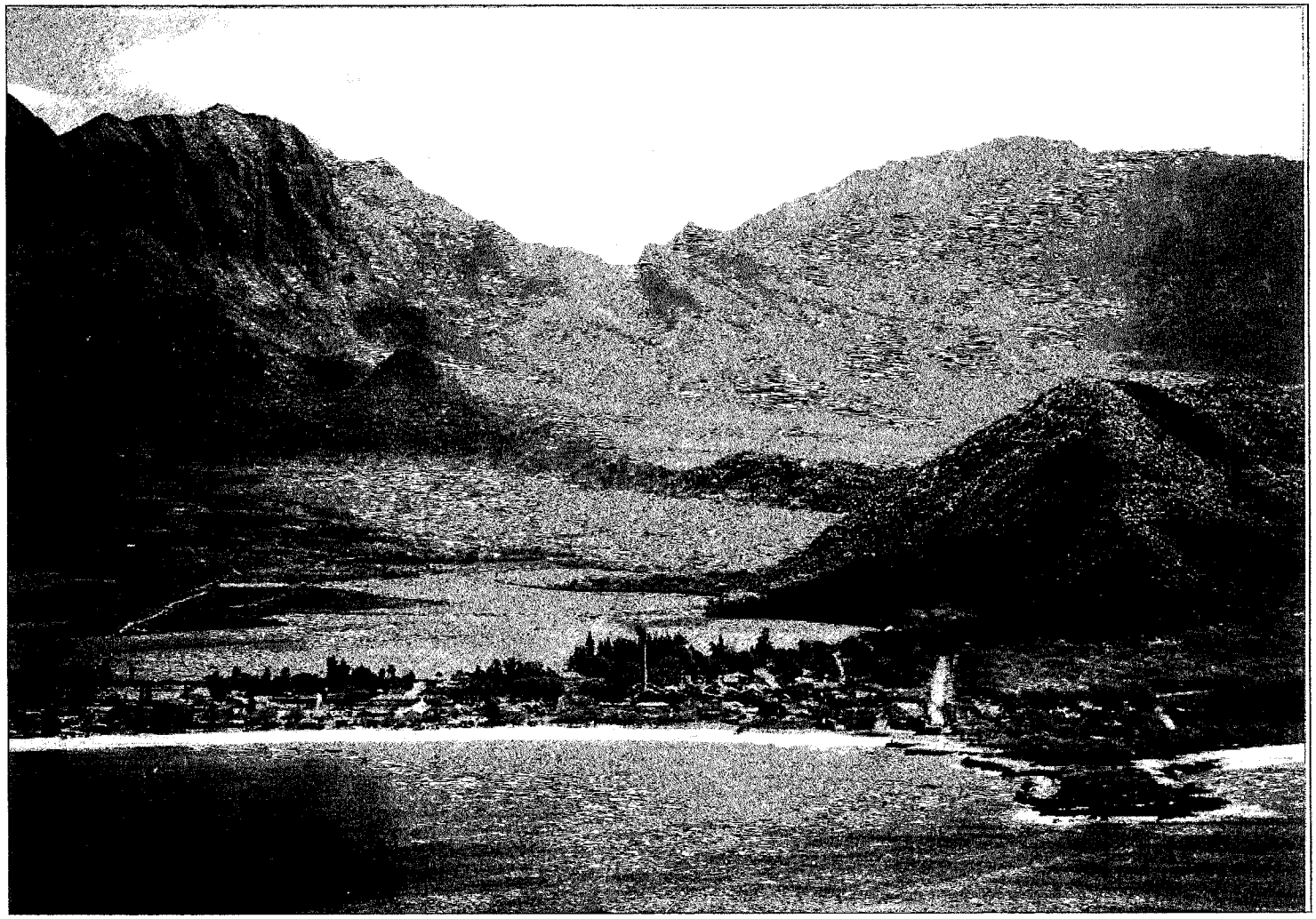


Figure 10. 1933 photograph of Pōka'ī Bay by Ray Jerome Baker (original photograph at the Hawaiian Historical Society; reprinted in Van Dyke and Ronck 1982:220); note Wai'anae Plantation Co. sugar mill smokestack in center of picture near the shore

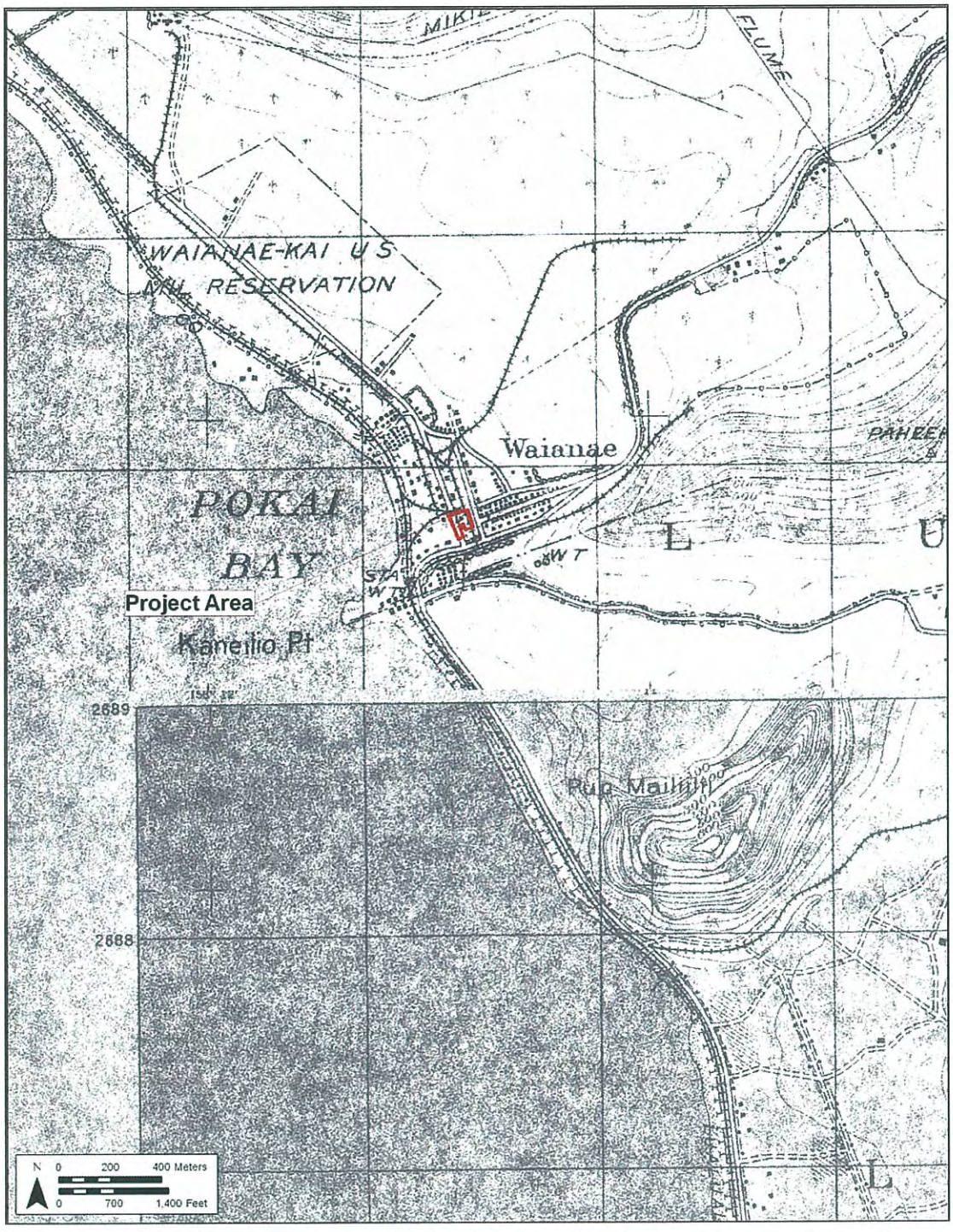


Figure 11. 1919 U.S. War Department Fire Control map (Wai'anae and Nānākuli Quads) showing project area (note sugar cane symbols arcing around from the north to the northwest and location of military reservation to the north west)

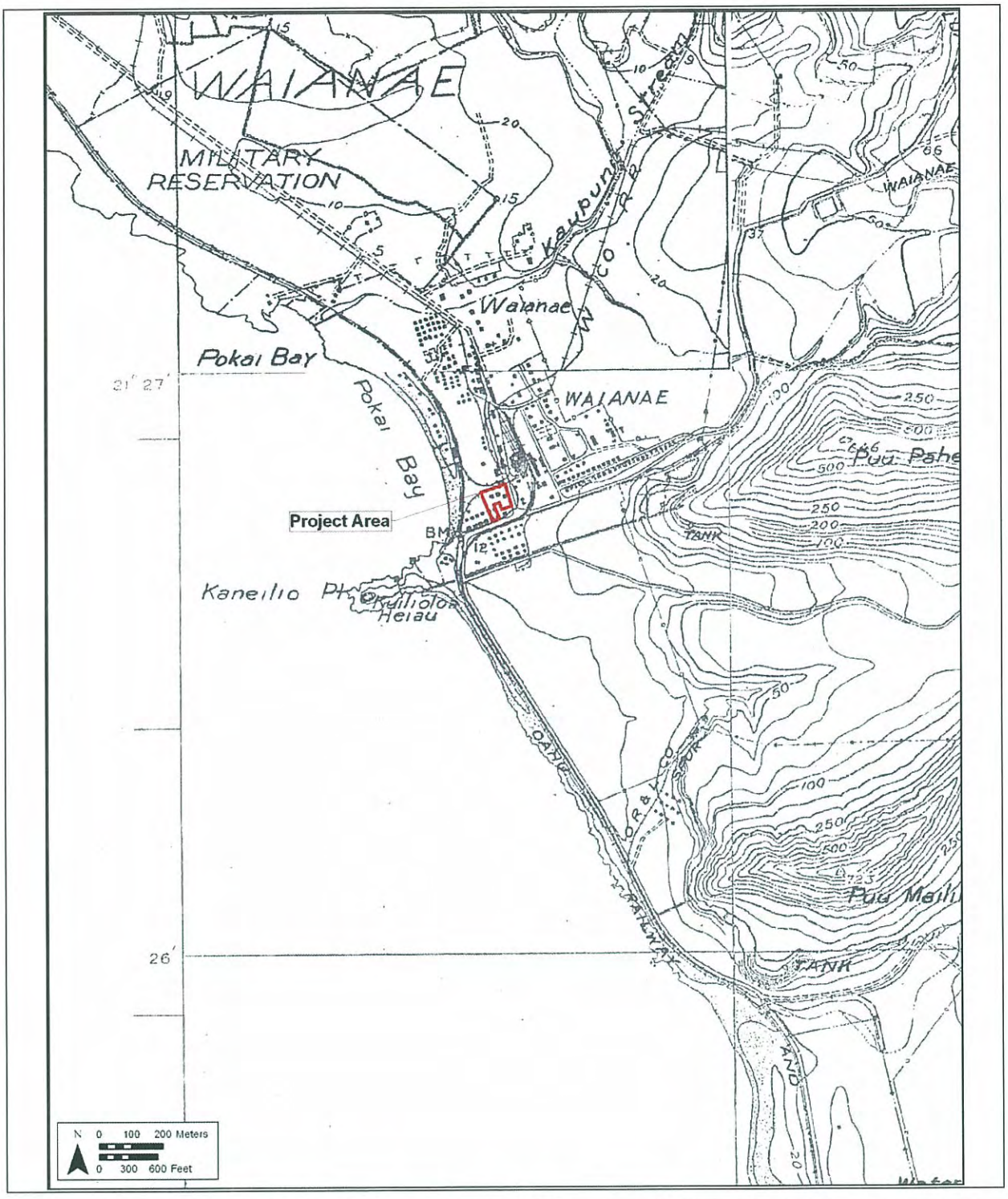


Figure 12 1928/29 U. S. Geological Survey map (Wai'anae and Ka'ena Quads) showing project area

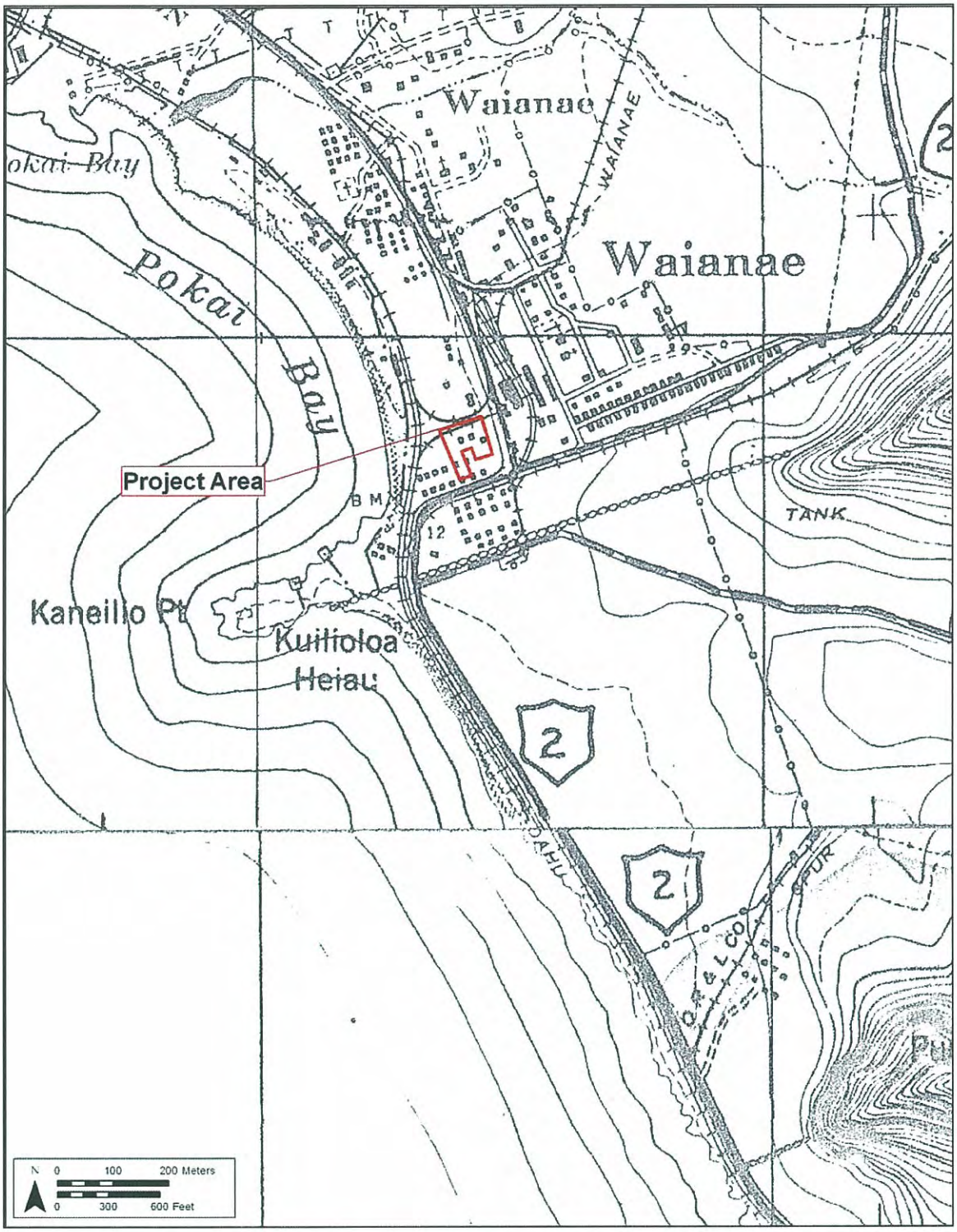


Figure 13. 1943 U. S. War Department map (Wai'anae and Nānākuli Quads) showing project area

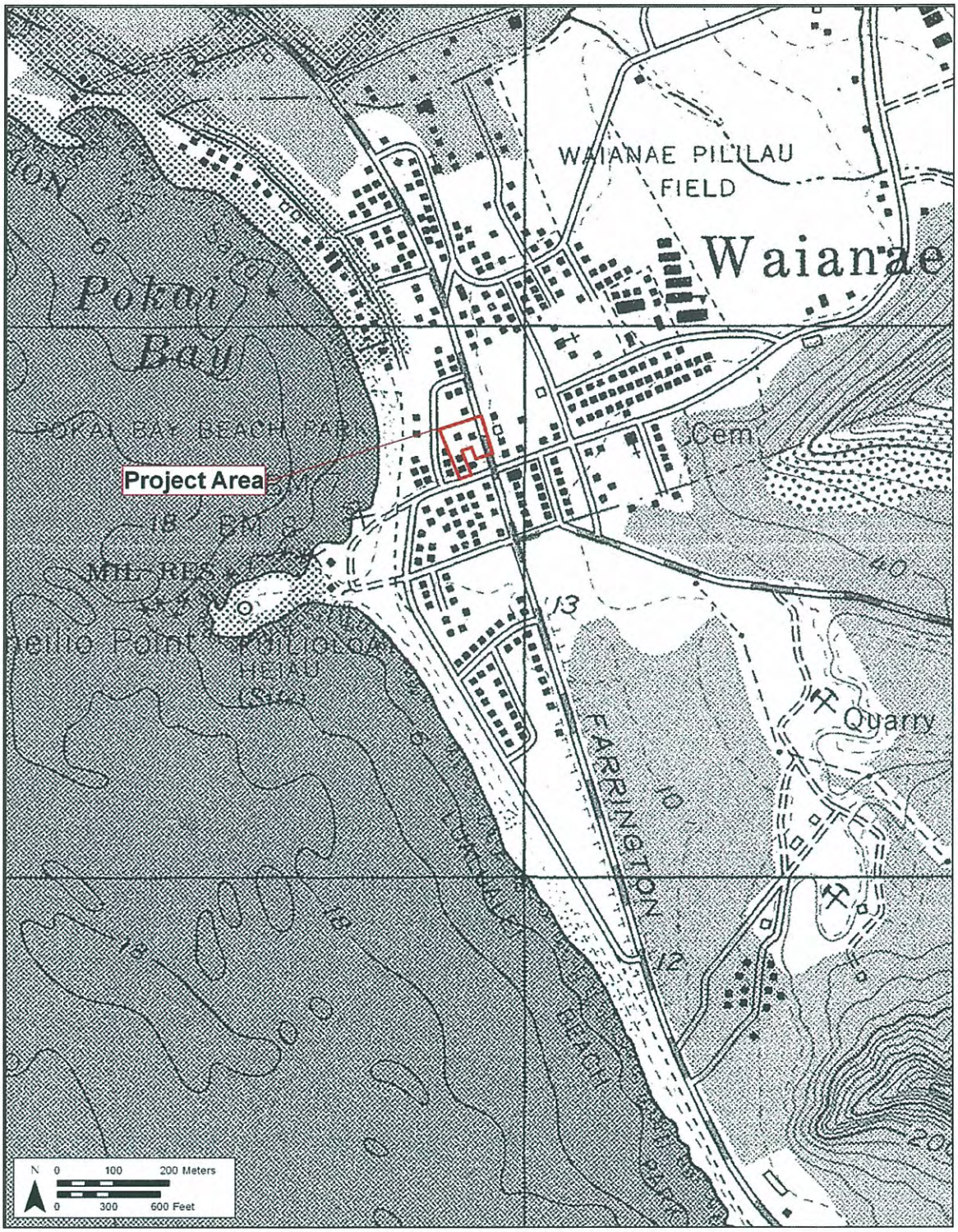


Figure 14. 1950s U.S. Army Mapping Service map (Wai'anae Quad), showing project area

Section 5 Archaeological Research

5.1 Overview

The main purposes of this section are (1) to establish a general context for the project area by providing an overview of relevant archaeological evidence for Wai'anae Ahupua'a, and (2) to provide a detailed discussion of the archaeological evidence within and immediately adjacent to the project area.

5.2 Early Archaeological Studies

Thrum (1907) and McAllister (1933) conducted the earliest archaeological inventories of O'ahu. Their surveys indicated a high concentration of significant sites in Wai'anae. In 1933 McAllister field-checked Thrum's previously noted religious sites, recording and mapping additional sites in Wai'anae (see Figure 5). The following is a description of the nearest sites, State Inventory of Historic Properties (SIHP) #s 50-80-07-153, 153-A, 154, 155 and 156.

> Site 153. Kuilioloa heiau, on the extreme tip of Kaneilio Point.
>
> The heiau is surrounded on three sides by water. It has three platforms, with evidence of terracing. The most important platform, evidently is at the end of the point. It is the highest, and terraces once marked the three sides toward the sea. Sand and dirt have been filled in between large stones. The second platform is lower than the first and is slightly wider. The pavement is similar to the first and, like the first, the walls were made by standing large pieces of lava on end and filling in. The walls have a flat, even facing. The third platform is lower than the second and can only be distinguished from the ground to the north and west by a row of stones in the grass. It is evenly paved with sand and may possibly have been used for house sites, as suggested by Thrum. (McAllister 1933:112)
>
> Site 153-A. Village of Waianae
>
> The village of Waianae, probably just mountainward of Site 153. The village was not, according to Vancouver, a very prosperous-looking community. (McAllister 1933:112)
>
> Site 154. Puehu Fishpond
>
> Located on the west side of the foot of Waianae stream, Puehu pond is said to have once been of great importance. Due to neglect it is greatly overgrown and its extent not clearly defined. Its original area was probably 300 by 75 feet, and it seems to have been dug out of the earth 25 feet from the stream. This pond is about 500 feet from the beach and is not affected by the tides, though the end toward the sea may at one time have been connected with the stream. The water now standing in the pond is from 1 to 2 feet deep. (McAllister 1933:113)

Sterling and Summers (1978:70) report that by 1954, Puehu pond was "almost completely filled in."

Site 155. Keaupuni

Keaupuni, said to be the name of a heiau which was once located on the small point on the Makaha side of Pokai Bay where the J. M. Dowsett home is now located. Nothing remains of the old temple. (McAllister 1933:114)

Site 156. Kahoalii heiau

Kahoalii heiau, on Puu Kahea. The present site of Mr. Brecht's barn was pointed out by Harry Poe and William Smithers as the old heiau site. Nothing now remains except an elevation of land and the knowledge among the natives. Thrum has the following information: Size 120 by 80 feet; entirely destroyed even to its foundations. Stones taken in 1870 for fence building. This is said to have been the place of Kahahana's residence, and the scene of some of Kamapuaa's escapades... This heiau destroyed by J. L. Richardson, and its stones used to enclose the manager's premises. (McAllister 1933:114)

5.3 Modern Archaeological Studies

Table 4 lists previously completed archaeological investigations in Wai'anae Ahupua'a. The table includes the source of the study, location, type of study, and any important findings from the studies. Previous archaeological studies in the vicinity of the present project area are located in Figure 15.

Table 4. Previous Archaeological Studies in Wai'anae Ahupua'a

Source	Location	Type of Study	Findings
Thrum 1907	Island-wide	*Heiau* study	Describes numerous *heiau*
McAllister 1933	Island-wide	Reconnaissance	Designated historic properties: 152-168
Chapman 1967	South central valley floor	Reconnaissance	Documentation of agricultural and habitation (SIHP # 50-80-07-2320): 24 pieces of *poi*-pounders were documented
Rosendahl and Rosendahl 1973	Wai'anae Kai	Wai'anae Kai Silting Pond Complex study	Describes four features: two mounds, a walled enclosure and a platform

Source	Location	Type of Study	Findings
Sinoto 1975a	Central coast	Reconnaissance Survey	Recorded five historic properties (three enclosures, a wall and an L-shape structure)
Sinoto 1975b	Central portion of the valley, on the eastern bank of Kaupuni Stream. TMK 8-5-04	Field Inspection	Inspection of enclosure (Site 50-0a-C3-22): Determined that structure was not a *heiau*, but probably a habitation enclosure
Ching 1978	NE valley floor (Camp Ka'ala)	Reconnaissance	Notes *heiau*, habitations, agricultural features and burials
Hommon 1978	KaMā'ili	Reconnaissance	Describes Kamaile Complex
Sinoto 1978	Back of valley	Reconnaissance	Describes pre-Contact agricultural complex
Sterling and Summers 1978	Island-wide	Compendium of data	Describes numerous historic properties
Kawachi 1979	Makaha Surfside KaMā'ili , Wai'anae	SHPD write-up of burial artifacts	Burial artifacts
Sinoto 1979	Back of valley	Reconnaissance Survey	Describes agricultural terraces, plots, enclosure, walls
Tao et al. 1979	Kū'īlioloa Heiau (SIHP # 50-80-07-153)	Research for *Heiau* Restoration	Describes excavation undertaken, five pieces of volcanic glass, sourced to the Kolekole area of Wai'anae.
Yent and Griffin 1979	NW slope	Reconnaissance	Describes complex of walls and platforms
Ahlo 1980	NW slope	Reconnaissance	Describes complex of mounds, walls, terrace, enclosures
Bordner 1981	Back of valley		No historic properties described
Ota 1981	Back of valley	Reconnaissance	Describes boundary or ranching walls
Rosendahl 1981	Central valley floor	Survey	Describes plantation era walls and ditches

Source	Location	Type of Study	Findings
Barrera 1982	Back of valley	Reconnaissance	Noted the possibility of old agricultural systems
EISC (Bordner) 1982	Back of valley	Reconnaissance	Describes agricultural terraces on Kānewai Stream
Neller 1982	NE valley floor & slope	Reconnaissance	Describes walls and pond fields
Kam and Ota 1984	Wai'anae Army Recreation Center	Burial Report	Two burials reported
Riford 1984	Wai'anae Army Recreation Center Site 50-0a-C3-23	Monitoring report on 943 meters of sewer and waterline trenching,	Five articulated human burials were recovered. Obtained a radiocarbon age of A.D. 1376+/-50 (C13 adjusted).
Hammatt 1985	NE valley floor (Camp Ka'ala)	Excavations	No significant findings
Hammattet et al. 1985	Wai'anae Army Recreation Center	Documentation of excavations	Excavation of 42 1-m^2 test pits and 114 sq m; burials of at least 10 individuals recovered. Concludes heavy use of the site for fishing preparation.
Hammatt et al. 1987	W slope, SIHP # 50-80-07-3200	Survey and Excavation	Excavation at: agricultural complex consisted of stone terraces and rock clearance mounds - minimal occupation indicated. Reports a C^{14} date of A.D. 1630-1950.
Komori 1987	Mauna Lahilahi	Survey and Testing	Located 16 features of SIHP # -3704
Douglas and Pietrusewsky 1988	Mākaha Beach Surfside Apartments	Burial study	Report on one burial recovered by SHPD

Source	Location	Type of Study	Findings
Shapiro and Rosendahl 1988	Wai'anae Kai, 250 acres of land in central to back part of Wai'anae Valley	Reconnaissance/ Subsurface Testing	34 historic properties recorded; all interpreted as historic, associated with agriculture, tool manufacture, habitation, transportation, recreation, erosion and water control. Trenching in former LCA awards area revealed gleyed deposits, possibly indicating taro cultivation
SHPD files for SIHP # 3967	SIHP # 50-80-07-3967	SHPD site files	Documents SIHP # 50-80-07-3967
Social Research Systems Co-op (Bordner)1988	Back of valley	Reconnaissance	Describes cattle walls, agriculture, habitation and religious complex
Cleghorn 1989	North coastal Wai'anae, Site 50-80-07-3966	Letter Report Regarding Archaeological Data Recovery work	Documents bulldozing
Masse 1989	East valley floor along Kaupuni Stream - Wai'anae Valley Interceptor Sewer Line	Reconnaissance	Stone walls, terraces, and portions of a stone enclosure were observed during survey. Survey was not completed due to denied access by armed property owner
Social Research Systems Co-op (Bordner) 1989	Back of valley	Archaeological Monitoring Reconnaissance	Describes habitation complex
Hammatt et al. 1990	*Mauka* Pōka'ī Bay Beach Park	Surface Archaeological Survey	No surface finds
Douglas 1991	The Beach at Makaha Surfside Apartments	Osteological study	Report on a child's skeleton
Denham et al. 1992	Central coast	Inventory Survey with Subsurface Testing	No historic properties

Source	Location	Type of Study	Findings
Kawachi 1992	Wai'anae Regional Park	Burial study	Documents one burial
Flood et al. 1994	W central valley floor	Inventory Survey	Documents one site with 24 features incl. 18 sinkholes
Schilz 1994	Wai'anae Army Recreation Center	Subsurface survey/Data Recovery	15 burials recovered
Jourdane 1995	Makaha Beach Surfside Condominiums	SHPD burial find report	Describes two burials
Kolb et al. 1995	Pāhe'ehe'e Ridge	Archaeological Survey and excavations report	Documents two shrine sites (one in Wai'anae, one in Lualualei)
Collins 1996	No provenience	Osteological study	Bones from MNI 10 people in possession of a Wai'anae resident
Borthwick and Hammatt 1997	W central valley floor	Burial Report	Documents six burials
Devereux et al. 1997	SW of Mauna Kuwale, 55-Acre Freitas Dairy	Archaeological Reconnaissance Survey	Two single-featured historic properties were identified; a bi-faced stone wall (SIHP # 50-80-07-5493) and a single room rectangular military bunker (SIHP # 50-80-07-5494)
Kapeliela 1997	Central valley	Inadvertently Discovered Human Remains	Documents one burial at corner of Lihue Street and Plantation Road
Borthwick et al. 1999	Pōka'ī Bay Beach Park	Archaeological survey with subsurface testing report	A total of thirty-four test units were excavated. No undisturbed prehistoric cultural layer or any burials were observed within any of the test units. Subsurface testing revealed extensive historic disturbance to all areas examined.

Source	Location	Type of Study	Findings
Cordy 1999a	Kūmaipō Stream	Archaeological Reconnaissance Survey report	Discusses numerous historic properties previously combined as SIHP # 2951
Cordy 1999b	Wai'anae	Historical study	Summary of Wai'anae early history
Cordy 2000	Back of Wai'anae Valley	Summary of the 1997-2000 Archaeological Field Projects	Summarizes fieldwork of the Wai'anae High School Hawaiian Studies Program
Gora et al. 2000	Kūmaipō area	Archaeological Studies by Wai'anae High School Hawaiian Studies Program	Documents a house site and terraces
Magnuson 2000	Coastal Wai'anae	Archaeological Reconnaissance study	No historic properties
Abordo et al. 2001	Back of the valley	Archaeological Studies by Wai'anae High School Hawaiian Studies Program	Documents a house site and agricultural fields (SIHP # 5706)
Brown et al. 2001	Wai'anae Valley, O'ahu	Archaeological studies by Wai'anae High School Hawaiian Studies Program	SIHP # 5802
Cordy 2001a	Wai'anae Valley Ranch	Archaeological Survey	Discusses 74 historic properties including 23 agricultural sites with hundreds of features, habitation, religious, and possible burial sites
Cordy 2001 b	KaMā'ili 'Ili	A Review of the Māhele Records	Review of Māhele records

Source	Location	Type of Study	Findings
Elmore and Kennedy 2001	Wai'anae Coast	Archaeological Inventory Survey	Documents findings from five separate corridors. One habitation/burial SIHP # - 5949 believed to be part of the Wai'anae (Kamaile Complex) (SIHP # –1181) and one sugar plantation camp
Hammatt and Shideler 2001	Pōka'ī Bay	Monitoring Plan	Discusses finding of three historic coffin burials
Kaikala et al. 2001	Back of the valley	Wai'anae High School Project	Documents a house site and agricultural fields
Berdy et al. 2002	Farrington Hwy.	Archaeological Monitoring Report	Describes one historic property (SIHP #6400, a historic trash pit)
Cordy 2002a	Front of Makaha Surfside Apartments	Archaeological Investigations report	Describes coastal habitation site
Cordy 2002b	Wai'anae District	An Ancient History of Wai'anae:	Summarizes ancient history of Wai'anae
Holt et al. 2002	House Site 5803 NE Wai'anae Valley 600-foot elevation	Report on archaeological work by Wai'anae High School Hawaiian Studies Program	Documents remains of three or four structures including two terraces, an enclosure, and a soil area used for permanent habitation
Shun and Shaw 2002	Wai'anae Army Recreation Center	Archaeological Monitoring and Sampling report	No significant finds
Jones and Hammatt 2003	Maunalahilahi Beach Park	Monitoring report	No significant finds
Bush and Hammatt 2004	Along Plantation Road across from Wai'anae Elementary School	Burial recovery report	One set of human remains encountered

Source	Location	Type of Study	Findings
Clark et al. 2004	Proposed Wai'anae Regional Park, Wai'anae Kai TMK 8-5-02:11 19.5 acres	Archaeological Inventory Survey	Assigns eight features to previously (Kawachi 1992) identified SIHP # 50-80-07-3967 including a burial, two enclosures, L-shape wall, and four sinkholes
Perzinski and Hammatt 2004	Maunalahilahi Beach Park	Archaeological Inventory Survey	New historic properties consist of an intact cultural layer (SIHP # 50-80-07-6634) and an historic basalt alignment (SIHP # 50-80-07-6635). Two previously recorded historic properties are a concentration of burials (SIHP # 50-80-07-4064) and a portion of the OR&L Railroad (SIHP # 50-80-07-9714)
Tulchin and Hammatt 2004	Farrington Hwy Kauluwaha north	Archaeological Monitoring Report	No significant finds
Jones and Hammatt 2005	Maunalahilahi Beach Park	Archaeological Monitoring Report For the Improvement Project	Two historic properties identified. Both properties were human burials with no structural surface features. The historic properties were designated SIHP # 50-80-07-6704 and 6705
Jones and Hammatt 2006	Wai'anae Valley Road and Connecting Streets	Archaeological Monitoring Report	No significant finds
Hammatt and Shideler 2006	Leeward Coast Emergency Homeless Shelter Project, TMK: [1] 8-5-028:041	Archaeological Inventory Survey	One property identified, SIHP # 50-80-07-6860 ,a single human burial. No other significant cultural materials were identified.
Tulchin and Hammatt 2007	Spotkaeff House Project	Archaeological Inventory Survey	One basalt rock and mortar structure associated with sugar cane cultivation was recorded (SIHP # 50-80-07-6858)

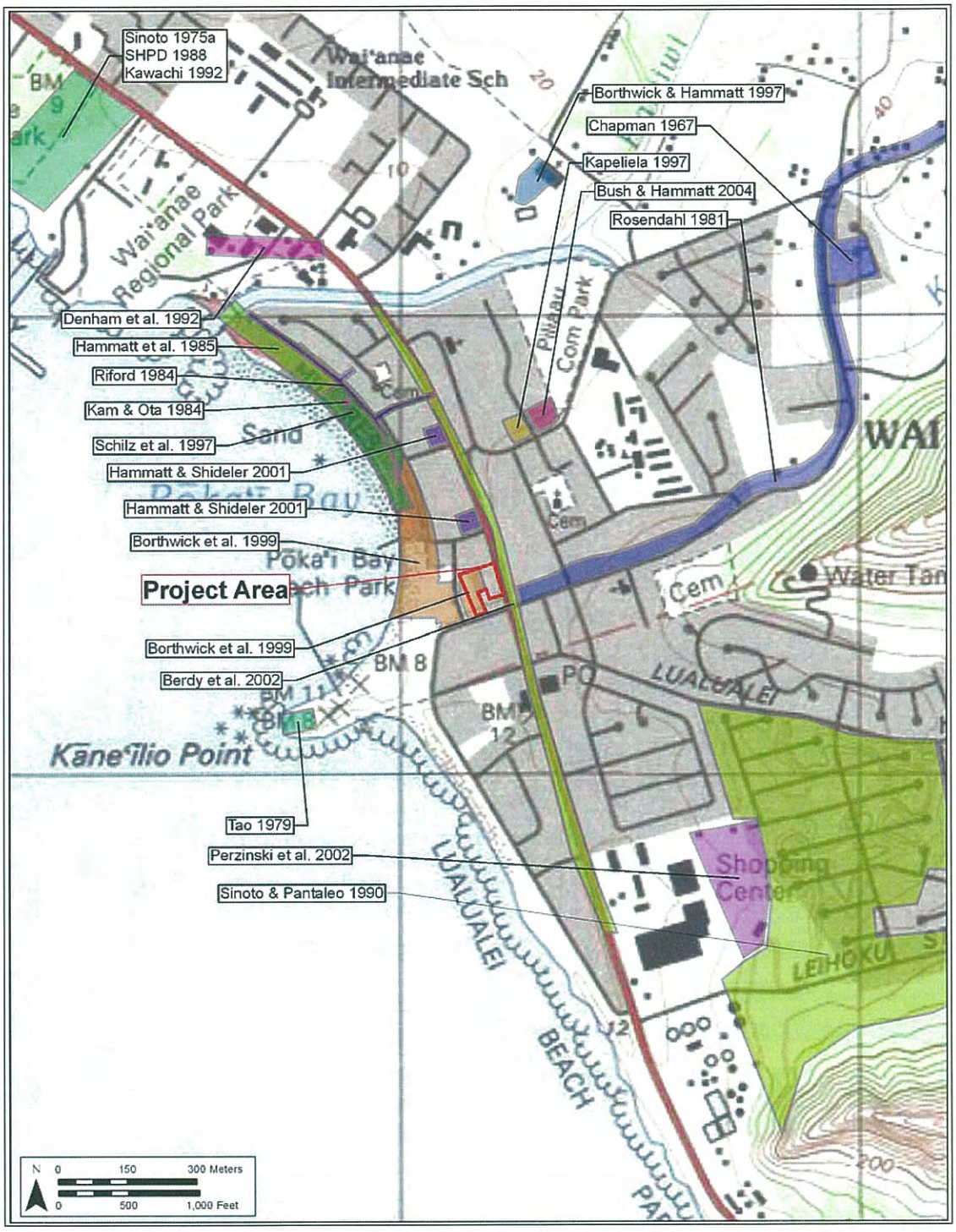


Figure 15. U. S. Geological Survey topographic map, Wai'anae Quadrangle (1998), showing the locations of previous archaeological studies in the immediate vicinity of the present Wai'anae Police Station project area

5.4 Studies in the Vicinity of the Current Project Area

Studies performed in the vicinity of the project area have yielded mixed results. Burials have been encountered at several locations. The pattern of discovery suggests that the highest density of discovered burials is on land to the north and northeast of the project area.

Several archaeological studies have been undertaken at the Wai'anae Army Recreation Center (WARC), and at least 32 burials have been uncovered along these sand dunes (Kam and Ota 1984; Riford 1984; Hammatt et al. 1985; Schilz et al. 1994; Borthwick et al. 1999; Hammatt and Shideler 2001). Kam and Ota reported two burials in 1984. Archaeological monitoring (Riford 1984) during sewer line installation at the WARC unearthed complete sets of *iwi kupuna* and resulted in the designation of Site 50-0a-c3-23 (Bishop Museum site number). Hammatt et al. (1985) identified at least ten individual sets of remains and concluded that there was heavy use of the site for fishing preparation. Six radiocarbon dates were also collected during the excavation of these 42 test units. The Schilz et al. (1994) Data Recovery Survey exposed 15 burials at the WARC.

Hammatt and Shideler (2001) documented three historic coffin burials at a lot at the northwest corner of Bayview Street and Farrington highway. Six human burials were reported from the Church of Jesus Christ of Latter Day Saints (Borthwick and Hammatt 1997). Other human burials have been reported at Wai'anae Regional Park (SHPD site file 1988, Kawachi 1992, Clark et al. 2004). South of Pōka'ī, along the coast, on the northern boundary of Lualualei *ahupua'a*, Berdy, Elmore, & Kennedy (2002) encountered an extensive historic trash pit, but no burials during archaeological monitoring along Farrington Highway.

Borthwick et al.'s (1999) archaeological survey of the Park area at Pōka'ī included subsurface testing near the subject project area. Little or no sand-dune deposits were encountered; rather trenching uncovered the coral shelf, part of the geological feature that makes up Kāne'īlio Point.

Below the coastal dune sands, within the uplifted limestone that forms Kāne'īlio Point, there is the potential for significant archaeological finds in sinkholes. The occurrence of sinkholes hold the potential for the presence of extinct avifauna including a true goose (*Branta* sp.), a goose-like *moa-nalo* of the family Anatidae (*Thambetochen xanion*), a small flightless rail (*Porzana ziegleri*), a large crow (*Corvus* sp.) and the Hawaiian petrel (*Pterodroma phaeopygia*), which were documented by Flood et al. (1994:147):

> Buried under the beach parks, under Wai'anae Army Recreation Center, and under coastal houses, stores and roads are archaeological deposits. These include habitation deposits, perhaps some of the earliest settlements along the coast, like those at Pōka'ī Bay and Kamaile. Fishpond soils are buried under fill in Wai'anae, 'Ōhikilolo and other spots. Lo'i soils are covered by fill at Kamaile and in lower Wai'anae valley. And the iwi of those earlier generations also lie buried in shoreline areas, near their former homes. These bones are uncovered by storm waves and by construction. These hidden archaeological sites are extremely important. The iwi need sensitive protection. The habitation, fishpond and lo'i deposits also need protection, for they contain important, missing information on the old times of Wai'anae. (Cordy 2002:133)

Section 6 Community Consultation

Throughout the course of this CIA, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about cultural resources and practices specifically related to the project area. The community consultation effort was made by letter, email, telephone and in person. In the majority of cases, letters along with a map and an aerial photograph of the project area were mailed with the following text with the exclusion of TMK parcels: [1] 8-5-008: 041, 043, 044 por., 051:

> At the request of the Gerald Park Urban Planner, Cultural Surveys Hawai'i Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the redevelopment of the Honolulu Police Department Wai'anae Substation. The existing Wai'anae Substation will be demolished and a new District 9 station erected on the same site. The project would be located in Wai'anae Ahupua'a, Wai'anae District, on the island of O'ahu, on a portion of TMK: (1) 8-5-008:040. Please see the attached maps.
>
> The proposed Wai'anae District Station will be built in two phases. Phase I proposes the construction of a two-story, 20,000-square-foot building (10,000 square feet per floor), fueling station, and parking for police vehicles, impound vehicles, and visitors. It also includes the replacement of the existing City's radio communications facility that shares the site. The radio facility improvements include a new radio tower (70 feet high measured from top to ground) and a 500-square-foot equipment building. Both will likely be located on top of the new two-story police station to avoid flood water inundation. Phase II construction will add a two-story, 4,800-square-foot building (2,400 square feet per floor) to the 'Ewa side of the Phase I building. When completed, the approximately 25,000-square-foot district station will accommodate patrol, investigative, and administrative units and associated support functions and facilities.
>
> Parking for 62 vehicles is required. The existing parking lot can accommodate some but not all of the required parking. Through a Memorandum of Agreement, the Department of Parks and Recreation will transfer land master planned in the Pōka'ī Bay Beach Park for recreational user parking to the Honolulu Police Department. The approximately .25 acre area to be transferred will be used explicitly for on-grade parking by HPD.
>
> The purpose of this cultural study is to assess potential impacts to cultural practices as a result of proposed development in the Wai'anae Police Substation. Our findings will be included in an Environmental Assessment being prepared for the project. We are seeking your input on any of the following aspects of this study:

- **General history and present and past land use of the project area.**
- **Knowledge of cultural sites- for example, historic sites, archaeological sites, and burials.**
- **Knowledge of traditional gathering practices in the project area, both past and ongoing.**
- **Cultural associations of the project area, such as legends and traditional uses.**
- **Referrals of *kūpuna* or elders and *kama'āina* who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua'a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within or in the vicinity of the project area.**

Several attempts were made by mail, email and telephone to contact individuals, organizations, and agencies apposite to the subject CIA. The results of all consultations are presented in Table 5. The review letter from SHPD (Figure 16) follows Table 5. The review letter from OHA is presented in Figure 17.

Table 5. Results of Community Consultation

Name	Background, Affiliation	Comments
Ailā, William	Hui Mālama I Nā Kūpuna 'O Hawai'i Nei, Wai'anae Harbor Master	CSH sent letter on December 16, 2008 and phoned on January 8, 2009.
Aldeguer, Walterbea	Leeward Community College	CSH sent letter December 18, 2008 and phoned on January 7, 2009. Mrs. Aldeguer recommended CSH interview Alice Greenwood, Harris Hopfe and Edith Texeira.
Ayau, Halealoha	Hui Mālama I Nā Kūpuna 'O Hawai'i Nei	CSH sent letter on December 16, 2008.
Cachola, Fred	Wai'anae *kupuna*, worked on restoration of Kū'īlioloa Heiau	See Section 7 below for interview.
Cayan, Coochie	SHPD, History and Culture Branch Chief	See SHPD response below table (Figure 16).
Cope, Agnes	Wai'anae Culture and Arts Program Executive Director	CSH sent letter on December 16, 2008. CSH phoned on January 8, 2009 and January 9, 2009.
Dodge, Vincent "Pōhaku"	'Ai Pōhaku Program Manager	CSH sent letter on January 7, 2009 and phoned on January 7, 2009. Mr. Dodge responded on January 12, 2008 declining to comment.
Enos, Eric	Director of Ka'ala Farms in Wai'anae	CSH sent letter on December 16, 2008. Mr. Enos responded on December 17, 2008, declining to comment.
Greenwood, Alice	OIBC and Wai'anae *kupuna*	See Section 7 below for interview.
Hopfe, Harris	Wai'anae *kupuna*	See Section 7 below for interview.
Josephides, Analu Kame'eiamoku	OIBC, and Nānākuli *kupuna*	CSH phoned Jan 8, 2009 and again on Feb 16, 2009.
Kanahele, Kamaki	*Kahuna (La'au Lapa'au)*, Native Hawaiian Traditional Healing Center, Director	CSH sent letter on December 19, 2008. CSH phoned on January 7, 2009 and February 16, 2009.

Name	Background, Affiliation	Comments
Kawelo, Gege (Georgette)	President, Wai'anae Hawaiian Civic Club	CSH sent letter on December 18, 2008 and phoned on January 7, 2009. Mrs. Kawelo declined to comment.
Kila, Glen	Principal, Kamaile Elementary School in Wai'anae	Mr. Glen Kila was interviewed by CSH on March 13, 2009. He has reviewed the interview and approved it with changes. Regrettably, Mr. Kila was unable to successfully send the document via email and CSH has made several attempts to make contact again with Mr. Kila but has been unsuccessful to date.
Lindsey, Keola	OHA	See OHA response below table (Figure 17).
McQuivey, Jace	Chair, O'ahu Island Burial Council	CSH sent letter on December 18, 2008 and phoned on January 7, 2009. Mr. McQuivey declined to comment.
Nāmu'o, Clyde	OHA Administrator	See OHA response below table (Figure 17).
Nunes, Keone	Cultural practitioner, *kākau* (expert tattooist)	CSH sent letter on December 18, 2008 and phoned on January 7, 2009. CSH sent a follow up email Jan 16, 2009.
Nu'uanu, David	Wai'anae *kama'āina*	CSH phoned on Jan 8, 2009 and sent letter on Jan 9, 2009.
Ornellas, Landis	Kāne'aki caretaker, and Wai'anae *kama'āina*	Mr. Ornellas was sent project letter from Mr. Ailā. CSH phoned Jan 07, 2009.
Paik, Kaleo	SHPD cultural specialist	See SHPD response below table (Figure 16).
Texeira, Edith	Wai'anae *kama'āina*	See Section 7 below for interview.

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

December 17, 2008

LOG NO: 2008.5700
DOC. NO: 0812PC04

MEMORANDUM

TO: Dominique Cordy, Cultural Research Specialist
Cultural Surveys Hawai'i, P.O. Box 1114, Kailua,Hawai'i 96734

FROM: Phyllis Coochie Cayan, History and Culture Branch Chief

Subject: WAIANAE 1: A Cultural Impact Assessment (CIA) for the redevelopment of the Wai'anae Police Substation, Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu. TMK: (1) 8-5-008:040.

This memo is in response to your request for kokua to assess potential impacts to cultural practices as result of the proposed development in the Wai'anae Police Substation.

The general area of the proposed redevelopment is a mere block from the sandy shores of Poka'i Bay and the heiau complex at Kane'ilio Point. SHPD's concerns would include any inadvertent burials exposed from ground disturbances at the proposed project, which are subject to the State Burials Law, Hawaii Revised Statutes, Chapter 6E.

Cultural practices that may be impacted from this redevelopment would include access to the shoreline for gathering purposes as well as other cultural practices at the nearby heiau at Kane'ilio Point or the general area for ocean recreation. There are numerous ocean recreational activities at Poka'i Bay which include canoe practices, swimming, body surfing, and general fishing by the public and native Hawaiians.

Some folks or groups to talk story regarding the project area include but are not limited to the following:

- William Aila, Jr., Wai'anae Harbormaster
- Landis Omellas, caretaker for Kaneaki Heiau
- Wai'anae Ahupua'a Council
- Makaha Canoe Club
- Kamaki Kanahele, Director, Native Hawaiian Healing Ce
- Walterbea Aldeguer, cultural resource person
- Vincent "Pohaku" Dodge, educator
- Alice Greenwood, Kupuna

Any questions, please call me directly at 692-8025 or via email at Phyllis.J.Cayan@hawaii.gov

cc: Dr. Pua Aiu, SHPD Administrator
Nancy McMahon, SHPD Deputy/State Archaeologist

Figure 16. December 17, 2008 Response from the State Historic Preservation Division

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD08/4106

December 24, 2008

Brian Cruz, Cultural Researcher
Cultural Surveys Hawai'i
P.O. Box 1114
Kailua, Hawai'i 96734

RE: **Cultural Impact Assessment consultation**
Wai'anae Police Substation redevelopment
Wai'anae, O'ahu
Tax Map Key: (1) 8-5-008:040

Aloha e Brian Cruz,

The Office of Hawaiian Affairs (OHA) is in receipt of your December 16, 2008 letter initiating consultation and seeking comments ahead of a cultural impact assessment (assessment) for the proposed redevelopment of the Wai'anae Police Substation. Based on the information contained within your letter, the proposed redevelopment project involves the demolition of the existing substation and the construction of a new two-story building and related facilities for police operations.

There are several accounts which provide some insight into the cultural significance of the project area which is located inland of Pōka'ī. It is said that Pōka'ī is the name of a chief who arrived from Kahiki and planted a coconut tree in that location. The resulting coconut grove is famed in song, such as "Aloha 'ia 'o Wai'anae" by Abigail Pilila'au and Rachael Kaleiwahea. This larger area is also known by the name "Nene'u" and the sandy beach now referred to as "Rest Camp" is known as "Malaea".

Ku'īlioloa Heiau is located on the tip of Kāne'īlio Point. The location of this heiau is an indication of it's significance and there are several mo'olelo which speak of the specific purpose for which it serves.

Brian Cruz, Cultural Researcher
Cultural Surveys Hawai'i
December 24, 2008
Page 2

OHA recommends consultation with the following individuals who may be willing to share their cultural knowledge of the assessment area with you: Alice Greenwood, Kimo Alama Keaulana, Glen Kila, Alika Silva, Analu Josephides and William Ailā.

OHA hopes to continue working with you to develop a paradigm shift in assessments which will truly identify the impacts proposed undertakings will have on cultural resources and traditional practices. OHA respectfully maintains the position that all parties bear a responsibility to work towards building successful working relationships with individuals, organizations and communities throughout Hawai'i which will result in a true understanding of what resources and practices are important to the Hawaiian people

Thank you for initiating consultation at this early stage and we look forward to the opportunity to review the draft assessment and provide additional comments. Should you have any questions, please contact Keola Lindsey, Lead Advocate-Culture at (808) 594-1904 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

Figure 17. December 24, 2008 Response from the Office of Hawaiian Affairs

Section 7 Summaries of *Kama'āina* "Talk-Story" Interviews

7.1 Overview

Kama'āina and *kūpuna* with knowledge of the proposed project and study area participated in "talk–story" sessions for this CIA. Interviews for this study were conducted in January, 2009. CSH attempted to contact 22 individuals for this CIA report; of those, 12 responded; and four participated in formal "talk-story" interviews. CSH initiated the "talk–story" sessions with questions from the following five broad categories: Resource Gathering and Hunting, Ritual and Ceremonial Practices, Freshwater and Marine Resources, Burials, Trails and Cultural and Historic Properties. Presented below are brief backgrounds of participants' "talk–story" sessions and their comments and concerns about the proposed project area.

7.2 Acknowledgements

The authors and researchers of this report extend our deep appreciation to everyone who took time to speak and share their *mana'o* (thoughts, ideas, beliefs, opinions, theories) with CSH whether in "talk-story" interviews or brief consultations, including contacts who opted not to contribute to the current CIA, but nevertheless spent time explaining their position on the proposed projects. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and not in any way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewee/s.

7.3 Fred Cachola

Mr. Fred Cachola was interviewed at his home in 'Ewa Beach by CSH on January 13, 2009. Fred Cachola is from Kohala, Hawai'i Island. He moved to Wai'anae, O'ahu in the 1960s. Although he is not a *kupu ka'āina* (literally sprout of the land) of Wai'anae Mr. Cachola is a dedicated community member and long time *kama'āina* of the *ahupua'a*. He formerly taught Hawaiian Studies at Wai'anae Intermediate School and raised his children on the Wai'anae Coast. Mr. Cachola has been a staunch advocate for cultural preservation, community and place-based learning. Although Mr. Cachola has recently relocated to 'Ewa Beach, he continues to call Wai'anae home. Speaking as a long time educator in Wai'anae and Nānākuli, he generously shared his time, *mo'olelo* and concerns about the proposed project area and the *ahupua'a* of Wai'anae.

Mr. Cachola described the project area as being part of an old plantation village, which before that had been Nene'u Fishing Village. He indicated that the area used to be divided into ethnic-based camps, with the Filipino camp west of the project area, the Korean camp south and Japanese camp east, across Farrington Highway. He further described the camp buildings as being built above ground on rock or cement base blocks so that there had been little or no ground disturbance in the area for the purpose of their construction.

Thinking back to the Pōka'ī of half a century ago, Mr. Cachola described the stone breakwater as having been in better repair, and inside of the breakwater, in the bay itself. He recalls a boat ramp that had been used by the plantation and in WWII times. Many fresh water streams flowed

into the ocean in and around Pōka'ī. The Wai'anae watershed had not yet been capped for water diversion, or channelized to the extent it has been today. The closest stream to the project area would have flowed out of Wai'anae Valley at Pōka'ī Road. Mr. Cachola remembered that:

> Wherever those streams went into the ocean is where *limu wawae'iole* was that we collected. Now, they made 'em into a huge drainage canal so that the *limu wāwae'iole* is gone. When I first started in Wai'anae, we used to be able to pick *limu wāwae'iole* down at Pōka'ī Bay at Rest Camp on the Mākaha Side and because there wasn't this huge drainage sewer coming right into the water. But when they built the huge drainage canal emptying right into the water, it killed all the *limu*.

North of where that canal is today, west of the project area, the railroad depot used to sit at the edge of the Pōka'ī Beach Park parking lot. *Mauka* of Kāne'īlio Point is Pāhe'ehe'e Ridge. Pāhe'ehe'e Heiau sits on the north side of the ridge below the modern water tank. Mr. Cachola confirmed that the remains of a *hōlua* (sled, especially the ancient sled used on grassy slopes; the sled course) slide sits on the point of the ridge aligned *mauka-makai* or from the mountain to the sea. He described the launching spot as behind the *heiau* and recommended the travels of Hi'iaka (Nathaniel B. Emerson's, *Pele and Hi'iaka: a Myth from Hawaii*) as an ancient reference of use for the very same *hōlua*. Mr. Cachola described much of the coastal area to the north of the project area in the *'ili* of Pāhoa as *niu* [coconut] trees.

Mr. Cachola remembered his time at Wai'anae Intermediate School, and his first experiences at Kū'īlioloa Heiau. He was and still is concerned with the way that children are taught history; he said that it is important to "teach history based on the community level," so that kids should "know about their home first," before they learn the history of other areas. Perhaps it was this strong belief in place-based learning that motivated the detour of a class fieldtrip from the post office to Kāne'īlio Point and Kū'īlioloa Heiau. Mr. Cachola recalled how the point was littered, having become an unofficial dumping ground of sorts:

> When I looked at that place in 1960, I couldn't believe that this was the site of a *heiau* because it was a community dump. All the trash from the picnic areas, from the people living down at the beach.

The military had erected structures on and around the *heiau*. A cement block one student found was an anchor for a radio antenna that was used in WWII. Mr. Cachola said that there was once a station built into the point, atop part of the *heiau* that was used to control the gunnery range along the coast, a radio control station.

Mr. Cachola began agitating for a clean-up. When he was inquiring no one seemed to want to claim jurisdiction over Kū'īlioloa.

> It was so funny because when I was inquiring I said, "who does this belong to?" I went to the County? They said, "it's not ours." I said, "oh, okay." I went to the State. The State said, "it's not ours." I said, "Fine, okay you know what, it's going be mine then. I'm gonna clean." "Oh, no, no, no, no, it belongs to somebody." I said, "Well, that's all I'm asking. If it's not yours, if it's not the County's, not the State's, then it's whose?" So, the State finally agreed it was theirs, but under the

> jurisdiction and management of the County. And then I said, "Well, I'm gonna go fix the *heiau*." No permits, no nothing. We just did it. Marion Kelly told me, "well how you gonna do it? I said "one stone at a time."

Mr. Cachola humbly pointed out that, "I was just a *malihini* [stranger, foreigner, newcomer, guest, company], I could instigate but not complete it [restoration]." So he began meeting up with *kahuna* in the area for guidance for the restoration project. Along with his students, other community members, and in cooperation with the Wai'anae Hawaiian Civic Club and Wai'anae Jaycees, the 'Kū'īlioloa Restoration Project' was born. Mr. Cachola sought *mana'o* from Charlie and John Na'one, from Jimmy and Aggie Pilila'au and Ed Kealanahele. Ed Kealanahele, a *kahu* (guardian or priest) from Kawaihae, emphasized the connectivity of *heiau*. He shared with Mr. Cachola that Kū'īlioloa could not be fully restored until it was reconnected to other *heiau*.

Mr. Cachola recalled that no one could remember much of anything about the *heiau* at a Wai'anae Hawaiian Civic Club meeting. After the meeting, Aunty Aggie Pilila'au pulled him aside. She told him, that yes, she did know about Kū'īlioloa, but because of her family's involvement with the church (her grandfather was a kahu) that her grandmother had told her it was *kapu* (taboo, prohibited) for them to go to the *heiau*. Mrs. Pilila'au told him that though she could not go help with the clean up that she would come and cook food for the volunteers at the park.

A huge sign was made for the day of the clean up and it was posted on a telephone pole on Farrington Highway. Mr. Cachola said it was amazing, that 100-150 people came throughout the day and helped with the clean up and restoration, hauling truckloads of trash away. Over time, even the stones were re-righted and the grounds on and around the *heiau* have been beautified and maintained. Mr. Cachola fondly remembered the unification of the community as they rallied around the restoration efforts at Kāne'īlio Point:

> ...and look at it today, it's revered. They still use it as a sacred site. And you know when you're down at Pōka'ī Bay, people know it's a very special place...and see after thirty years it's still clean, it's still respected, people still take care of it.

Since the community came together to clean and restore Kū'īlioloa, it has been used for protocol, for cultural education by schools and the community, as well as by navigators.

Mr. Cachola explained how the prominence of Kū'īlioloa, granted visibility and range not only for the US military but for Hawaiians as well. Kūpuna used Kū'īlioloa, in a way similar to the military's controlling station, but with the added humility of a religious space. Kū'īlioloa, Mr. Cachola pointed out, is not only visible from coastal points but from many of the ridges and upper valleys of the Wai'anae Range, but that the *heiau* is a gateway at the entrance to Wai'anae Ahupua'a, and along the coast or through Kawiwi into Mākua or Kahanahāiki. Mr. Cachola stressed the importance of not only Kū'īlioloa, but of its relationship with other *heiau* in the area. Mr. Cachola explained:

> All the *heiau* in that area, and if you draw connections, they're all connected. They're all interconnected. It's easy. That's why there could be a pronouncement made at Kū'īlioloa that would spread through the district in seconds...that's the

> association. That's the cultural significance of Kū'īlioloa, is the covering of this ku loa, this whole area. The skin, the skin of this Kū'ili that covers the whole area, Kū'īlioloa and this *heiau* here is part of it.

Kāne'īlio Point is also a jumping off point to Kaua'i, which is visible on clear days. Mr. Cachola reminds us that it is at Pōka'ī Bay where Kamehameha would have gathered his fleet before setting off to Kaua'i. Mr. Cachola also made an interesting point: if the winds had been different Captain Cook might have landed at Pōka'ī Bay instead of at Waimea, Kaua'i.

Mr. Cachola expressed cultural concerns about excavations that would occur for the proposed Honolulu Police Department Wai'anae Substation Redevelopment Project. He cited a dense population of Hawaiian families that had lived in Nene'u fishing village, and the lack of development on the beach park side of the current substation that suggests a high likelihood for finding *iwi kūpuna* beneath the ground. Mr. Cachola also expressed a desire for increased education regarding the Kū'īlioloa Heiau, which the people of Nene'u would have had access to as they once lived as close to it as the current project area is. In his discussion of the centrality of the location of Kāne'īlio Point, Mr. Cachola described Kū'īlioloa Heiau as, "one of the most significant *heiau* on the Leeward Coast." Mr. Cachola was concerned with the cultural importance of maintaining line-of-sight from Kū'īlioloa Heiau to other *heiau* in Wai'anae Valley and along the coast. He described *heiau* as "not isolated. They form a network and these networks have purposes," for worship, communication, defense and navigation. Mr. Cachola broke the name down as an allusion to "the covering of Kū over all," or all over, indicating a more central importance of Kū'īlioloa Heiau in relationship to other *heiau* within Wai'anae and along the coast heading north and south. Mr. Cachola requested that construction of the proposed buildings and radio tower take care not to obstruct these views. Though the *heiau* is within the jurisdiction of the State Parks versus the Honolulu Police Department, the State Parks is transferring a small portion of land to the Honolulu Police Department to benefit the expansion of the police station.

Mr. Cachola also expressed a concern that the conversion of this small portion of park property to municipal purposes not be the start of a larger trend in the area. And he recommended that a permanent sign be erected at the nearby entrance to the *heiau* to convey the importance of the site for the benefit of the park users and surrounding businesses, civil servants, and community.

7.4 Alice Greenwood

Mrs. Alice Greenwood spent her early childhood in Wai'anae, grew up in Honolulu and has spent most of her adult life in Wai'anae Valley (Figure 18). Both of her parents are Wai'anae *kama'āina*. At the time of this interview she is an active member of the O'ahu Island Burial Council. Aunty Alice Greenwood has also acted as a cultural monitor on development projects in Wai'anae Ahupua'a in the past and was recommended to CSH by Mr. William Ailā to act as a cultural monitor for the Wai'anae Police Substation Redevelopment Project. This *kupuna* and long-time native of the Wai'anae Coast was kind enough to meet with CSH on Friday, January 16, 2009, accompanied by two other Wai'anae *kūpuna* (See Figure 18 below – a photograph of

Wai'anae *kūpuna* Mrs. Alice Greenwood, Mrs. Edith Texeira and Mr. Harris Hopfe) to talk story about the project area and share her *mana'o* about growing up near Pōka'ī.

Mrs. Greenwood was first introduced to Hawaiian sites, features and *heiau* when she was a child. "When we were kids we knew, that was our playground. Especially [from] my mom, she was into it, because her grandmother was a *kumu hula* [hula teacher] for Lili'uokalani and David Kalākaua." Her grandmother's name was Kauhailulikua, "she is in Maui history books... her family is part of the Luluka family...so the Kilas [referring to Glen Kila's family of Wai'anae] are also related to us through the Luluka side." Mrs Greenwood explained that the Luluka line came to Wai'anae when King Kamehameha came with his warriors and their families either while they mobilized to make the trip to conquer Kaua'i or on the return trip. She said they were known as the "vanguards of the *ali'i*."

In her youth Mrs. Greenwood, along with her cousins Rebecca 'Ululani Kaiona and Daisy Kaiona, would help their Uncle Simplicio Dela Cruz dig for cesspools. "That's how we would earn some of our money, twenty-five cents." Because the holes would have to be so large and deep she explained that's why both her family and her Aunty would all work together. She laughed that it was all by the bucket and shovel; hand labor, bucket and rope. During all these excavations they came across burials and artifacts. It was "My mother and my aunty who used be the ones who used to handle them [*iwi kūpuna*] every time we would find them. They would be the ones." Her mother was Rebecca Kaiana. Her Aunty Daisy was married to Simplicio Dela Cruz.

When Aunty Alice was young she described many more open spaces than we see today, and like Mrs. Texeira (see interview below), she described everyone as using larger properties for their own family as well as communally. The divisions of land at the time still seemed diffuse, unlike the stark boundary lines of today's private properties. The cultural use of land for planting, harvesting, even dwelling was more communal and followed a more traditional understanding of land tenure as recently as when Mrs. Greenwood was young:

> I don't know how you feel about it, but during the time we were brought up, we went all the way up to the stream. We thought that was our property because we used the whole thing, planting peanuts, and all of these things. Today when I look at it I think, oh it is so small. I thought it was all the way to the stream.
>
> When we were little we used the whole works, it was not what is assumed to be now, we used the whole works. Our neighbors never complained. In fact they themselves were using other properties too.

Mrs. Greenwood's discussion highlights the changes in the way the Hawaiians used land communally only a generation ago. This was a more Hawaiian epistemological approach to the use of land. Even after Land Commission Awards were granted in the 1850s communal land access within *ahupua'a* continued into the time of Mrs. Greenwood's youth. The access to multiple properties has stopped in less than a generation. In recent times property lines are being more starkly defined physically and ideologically. As the Wai'anae Coast has become more developed, land use there is based more strictly upon land ownership.

The watershed in Wai'anae has also shifted in recent times. Mrs. Greenwood thought back to her youth, and recalled the abundant waters that flowed from Wai'anae Stream into the ocean:

> One day I turned around and I told my children that when we were young, we used to go down by Cornet's [Store]. We used to go diving over there and the thing was deep. So I told my son, "come, come we'll go look over there, that this place is deep and real neat and everything." When I went over there it [the water] only came up to my ankles. They were like, "yeah mom, we like see you dive in now." When we were small, the thing was deep, it came over our heads.

Mrs. Greenwood was asked what the area around Pōka'ī Bay and the existing police substation used to look like and if the police substation was in the same place. In her youth Mrs. Greenwood (like Mr. Hopfe; see interview below) said that it was there, and so was the courthouse. She joked that the current police substation was the new one, and that the proposed redesigns would be the third station in her memory to sit in that spot. The *kiawe* tree just *mauka* and north of the police substation had scales attached to it at one point; Mrs. Greenwood remembers it was a balanced and weighted scale where fisherman would weigh their catch. There were also plantation homes along the project area and along the road near Pōka'ī. In fact, she said that the side road near the Bay (the *makai* portion of Wai'anae Valley Road) used to be the route of Farrington Highway (Figure 19, Mrs. Texeira's map, which illustrates the old road path). Like Mr. Hopfe, Mrs. Greenwood also recalled a flume system for plumbing at the plantation homes, "they had flumes for sewer, it just spilled out...[the] sewer was in the Mā'ili side, just pumping into the ocean."

In regards to the proposed redesigns for the Wai'anae Police Substation, Mrs. Greenwood's main concern was over *iwi kūpuna* that might be on the property. She mentioned that the McDonalds and KFC nearby was a cemetery and that other *iwi* had been found during developments near the beach. Mrs. Greenwood was told that Mr. William Ailā had recommended her as a cultural monitor for the project, and she was amenable to participating in that capacity.

7.5 Harris Hopfe

Mr. Harris Hopfe grew up practically on the water at Pōka'ī. His mother, Ana, is a Kila, a family which has long lived at Pōka'ī. She taught at the old Wai'anae Elementary School. Mr. Hopfe's father, Henry Hopfe, came from Germany, married Ana Kila, learned Hawaiian and settled down at Pōka'ī. Mr. Hopfe grew up less than a quarter mile from the project area and spent his childhood and his adult life in the Pōka'ī area. On January 16 2009 Mr. Hopfe kindly took the time to share and talk story with CSH about Wai'anae and growing up at Pōka'ī.

Mr. Hopfe attended Wai'anae High School and Wai'anae Elementary: "It used to be at Pilila'au Park, and some of the buildings are still there I think." He said that in school they had to speak English, no Hawaiian. When asked if his story growing up was similar to Mrs. Greenwood's, in that she was not allowed to speak Hawaiian, Mr. Hopfe told us more about his father:

> You see, my dad, he was a German, he came *from* Germany, and he spoke Hawaiian, he learned. Yes, he spoke Hawaiian, him and my Mom used to when they never wanted us [the kids] to hear anything, they would converse in Hawaiian.
>
> We would ask, "You tell us to go to school to speak English, but you, you are learning Hawaiian, you spoke Hawaiian. How come we cannot?"

When I asked him what his father's response was, he laughed and said, "We got dirty lickin's." He [his father] said, "now it's modern and there is no English, only Hawaiian." I said, "How come you and mom can?" I was always after him, to learn the Hawaiian language, but he said no.

Mr. Hopfe was asked what the area around Pōka'ī Bay looked like when he was a young man. Mr. Hopfe recalled that there used to be a Tamura's store by the church and that, near the church on the *makai* side of the Highway, was where the old Coconut Grove (see Figure 7) used to be. Taco Bell, he recalled, used to be a trade-in store. Mr. Hopfe could remember Freeky and Clark as the names of two past plantation managers when he was growing up. He also mentioned that the Nu'uanu family used to live by the Wai'anae Stream Bridge. He remembers buying sugar from the Cornet Store and the saltpans that were along army beach, near the current high school. Where the eyeglass store is now, Mr. Hopfe along with Mrs. Greenwood, remembered an old general type store called Lau Tang's. A. K. Chong's, a store and restaurant, used to be across the street. It is where the purple building sits now. From the police station, A. K. Chong's was *mauka*-across Farrington Highway, on the same side of Wai'anae Valley Road as the police substation.

When asked about the area including and around the existing Wai'anae Police substation and the existing police station Mr. Hopfe (like Mrs. Greenwood) said that the station and courthouse remain in the same place. He said that the current police substation was a new one, and that the proposed redesigns would be the third one in his memory to sit in that spot. In regards to the immediate vicinity of the project area Mr. Hopfe described houses being in the parking lot and in the park area fronting Pōka'ī. When asked what sort of structure the old plantation homes were, he said they were all built on stacked bricks. Mr. Hopfe specifically mentioned that there was no digging in the construction of these homes. When asked if they had cesspools, he remembered a flume system for water and sewer.

7.6 Edith Texeira

Aunty Edith Texeira was born in Honolulu and moved to Wai'anae Ahupua'a in the early 1940s. Her mother and father, John and Susan Soares, were both originally from the valley, and had property up *mauka* from their families. Mrs. Texeira and her daughter Maima were gracious enough to spend their afternoon with CSH in late January 2009 and lend us the use of a detailed map Mrs. Texeira had drafted, showing what used to be in the area during her youth.

Her mother's maiden name was Susan Armstrong; the lands Mrs. Texeira has now were her mother's wedding gift to her father. They lived mostly on their property up *mauka* in Wai'anae

Valley. Living there, Mrs. Texeira told us about the *puhi* (eel) scarred cliffs. The scars made by a famous *kupua* during his death throes famed in a Wai'anae *mo'olelo.*

The Soares family's *makai* property was near the mouth of Wai'anae Stream, near the school in the lowlands of the *ahupua'a.* When asked if she could see Pōka'ī Bay from her home so close to the water Mrs. Texeira replied, "Although it was very open there were big *kiawe* blocking the ocean view," much like there is today. Even though there was no *makai* vista, looking *mauka* from her property up Wai'anae Stream, she remembers seeing an extensive flume system crossing all along the river going up toward Pu'u Ka'ala. Before the extensive capping of springs for water mains and the concreting of streams for erosion and flood control, these flumes utilized the annual flowing streams and *plentiful* springs of Wai'anae to take water from the greener *mauka* area to the drier lowlands, *makai.*

Flowing into the ocean on the Lualualei side of Kāne'īlio Point, Mrs. Texeira told us, was raw sewage. Just as there were no water lines when she was young, neither were their sewer mains:

> In the plantation houses they had this kind of toilet system: of flumes underneath. It made the water flow. The toilet was set right on top. The water was supposed to be running underneath, but they had this room, tank like, as soon as it got filled up it would automatically dump itself over, and all the mess would run out...and go to the ocean. These big tunnels would be outlets for the sewer. On the Mā'ili side of Kāne'īlio Point is where this big sewer tunnel spilled out.

Mrs. Texeira pointing out that people swam on the Pōka'ī Bay side, but it was close and she believes the empty tunnel is still there at the shore. The sewer culvert spilled out into the ocean in the same area where she used to be able to gather *limu kohu (Asparagopsis taxiformis)* and *limu wāwae'iole (Codium edule).* Today, little or none of those ocean resources remain in the area. Mrs. Texeira said that not even 45 years ago there were houses in what is now the parking lot in front of Kāne'īlio Point. CSH asked her if she remembered the homes being set above, atop, or into the ground, or if she remembered utilities like water or sewer dug below ground. Mrs Texeira was very certain that the homes formerly in the project area were set up from the ground, "stacked" on blocks.

Mrs. Texeira remembered *hāuli* ferns that used to grow large leaves before and now can only be found small in size if at all. The *'iwa'iwa hāuli,* or maiden hair fern, had fanning leaf sections. Using the leaves, the fern would be pounded with *pa'akai* (salt) to make a poultice. In her youth, Mrs. Texeira and her family would gather the *hāuli* from the coastal area; however she also recalled gathering *mauka* plants from Pu'e'a 'Ili of Wai'anae Valley. The *pa'akai* they used in poultice and for myriad other things was gathered from the natural salt pans out at Army beach.

When asked about the empty lot behind the current Wai'anae Police Substation, on the east side of the road fronting the beach and the *hale wa'a* (canoe house), Mrs. Texeira remembers a family living there, though she could not recall the name. On the south side of the property she remembers plantation houses from Filipino Camp. On the actual Wai'anae Police Substation lot she recalled an activity hall and a small courthouse (see Figure 19, Mrs. Texeira's map).

"The *kiawe* tree was the same tree that was there long ago, that is the original tree." said Mrs Texeira, and from that tree she remembers fisherman hanging their scales to weigh their catches.

Mrs. Texeira also mentioned that from the road near this *kiawe*, you can still feel the railroad tracks, which were paved over. Pulling out her map, Mrs. Texeira showed us that the road fronting the *makai* side of the police station used to be Farrington Highway, where Wai'anae Valley Road dead ends today. During plantation times and the days of the Nene'u fishing village, there would have been a lot more traffic very close to Kāne'īlio Point and the old court house, currently the Wai'anae Police Substation. It was not until more recent years, in fact, that Farrington Highway was set back from the ocean at Pōka'ī, to where we see it today.

When asked about her opinion regarding the upcoming project, Mrs. Texeira expressed concerns about *iwi* that might be on the property; she recalled *iwi kūpuna* that had at one time been unearthed across the street from the project. Other than taking care of the *iwi kūpuna* in the area, Mrs. Texeira did not have any issues with the proposed redesign of the substation.

7.7 Group Contributions

Because Mrs. Edith Texeira, Mr. Harris Hopfe and Mrs. Alice Greenwood were all interviewed together some of their knowledge was shared, contributed by the whole as a group. These group contributions are offered as follows.

Mrs. Edith Texeira and Mrs. Alice Greenwood both recalled limu growing in the Pōka'ī area: *pepei* (probably short for *pepeiao*, like *nihoniho*, a name for scallops), *limu kohu (Asparagopsis taxiformis)*, *limu wāwae'iole (Codium edule)* on the south side of Pōka'ī Bay. On the Pōka'ī Bay side these ladies recalled being able to gather *pepe'e* (young fern leaves), *hina (Artemisia hillebrandii)*, and *salauake*, or sharp quilled *wana* (sea urchin; *Echinothrix diadema*). They went to pick just to eat or for their families if they were making something. Both Mrs. Texeira and Mrs. Greenwood lamented the over-gathering, beyond sustenance, that has led to the depletion of modern Pōka'ī resources. Today the sharp quill *wana* is gone.

All three *kūpuna* talked about the depletion of marine resources, such as fish; they all recalled that, when they were young, there were plentiful varieties of cowry, coral and *puka* shell at Pōka'ī, none of which are.abundant anymore.

From the land, people fished for *halalū* (young *akule* 5-6 inches) and *akule* (big-eyed scad, *Trachurops crumenopthalmus*). Harris Hopfe recalled that Bob Meyers used gas lamps to fish at night. The fish were not attracted to the light, but to the bugs that were drawn to the lamps.

Mrs. Texeira's father used to throw net off Pōka'ī. Once she said they caught an *ulua* (*Caranx ignobilis*) in the net. They used to fish for mullet, *moi* (thread fish, *Polydactylus sexfilis*) and *awa* (milk fish, *Chanos chanos*), *he'e* (various octopus and squid species), *manini* (convict tang, *Acanthurus triostegus*), and a lot of *nehu* (anchovy, *Stolephorus purpureus*). Mrs. Texeira remembered "the *nehu* was at one time so plentiful that when the water would splash up [on shore] and the *nehu* would be on the sand. It's because they would spawn. And at the time we still had plenty of water coming out of the streams." She said that there was an old Filipino man when she was young, who would use the crab (*papa'i*) as bait.

Figure 18. Photograph, from left to right, Mrs. Alice Greenwood, Mr. Harris Hopfe and Mrs. Edith Texeira

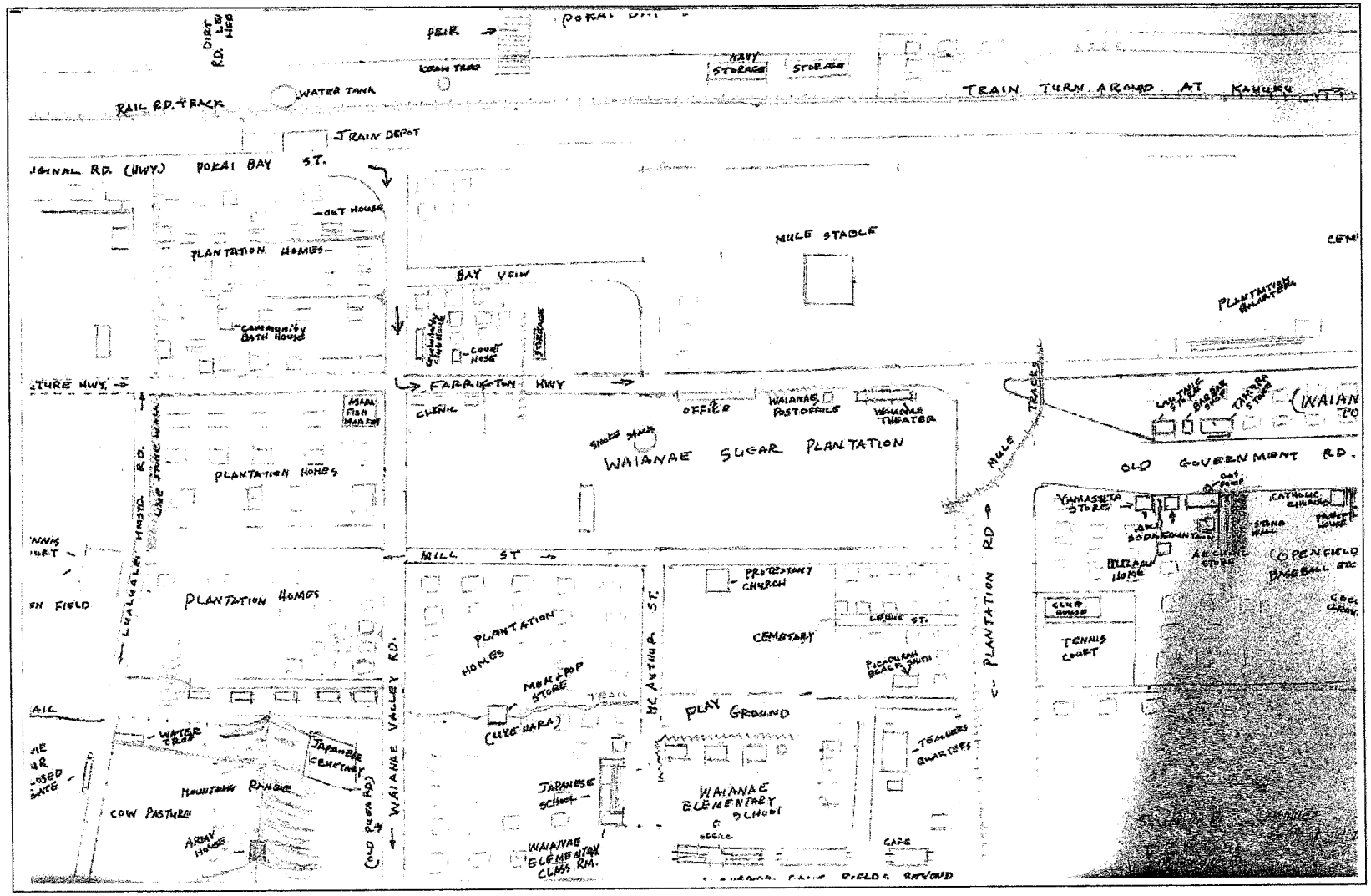


Figure 19. Wai'anae Map provided by community consultant Edith Texeira

Section 8 Cultural Landscape of the Project Area

8.1 Overview

Discussions of specific aspects of traditional Hawaiian culture as they may relate to the project area are presented below. This section examines cultural resources and practices identified within or in proximity to the subject project area in the broader context of the encompassing Wai'anae Ahupua'a landscape. Excerpts from "talk-story"sessions from past and the present cultural studies are incorporated throughout this section where applicable.

8.2 Growing and Gathering of Plant Resources

Wai'anae Ahupua'a occupies the central portion of Wai'anae District on the leeward coast of O'ahu. The district originally owed its fame to its multitude of fish and especially for the opportunities for deep-sea fishing from the calm leeward side of Ka'ena Point, where the ocean currents meet.

Wai'anae in the 1790s was the center of habitation for the Leeward coast. The valley was well watered and the ocean hosted an abundant supply of fish, the lowlands produced *'uala* (sweet potato, *Ipomoea batatas*) and *niu* (coconut tree, *Cocos nucifera*), and the inland valley boasted *kalo* (taro, *Colocasia esculenta*) and *wauke* (*Broussonetia papyrifera*, used for making *kapa*, a bark cloth). The upland forest regions sustained various trees whose wood could be worked into weapons and canoes.

It is possible that *kalo* was being cultivated in the lowlands of Wai'anae for over 800 years. During archaeological investigations inland of Pōka'ī Bay, samples from three trenches in a complex of possible *lo'i kalo* were dated back to A.D. 1170-1430, 1270-1480, and 1299-1510 (Shapiro and Rosendahl 1988:32). The aggregate of dates suggests not only cultivation, but permanent habitation of lower Wai'anae Ahupua'a by at least the late 1100s. Sterling and Summers (1978:68) cited Handy, *The Hawaiian Planter* (1940:83 Vol. 1), describing "extensive systems of terraces" along the streams not only in the uplands but down into the areas that were later covered in sugar cane.

The uplands of Wai'anae are well watered, providing an environment for various trees, whose wood could be worked into weapons, *wa'a*, and tools. During the export of sandalwood to China from 1800-1830, the *ali'i* held monopoly over the trade. By the middle of 1828, the stands of sandalwood in Wai'anae were likely depleted almost entirely. Once Liholiho opened up the sandalwood trade to his chiefs, the resulting unrestrained demand on the stocks of the wood and upon the commoners who did the harvesting resulted in the decimation of sandalwood groves across the islands. Wai'anae coast may already have been depleted. Boki Kamauleule supervised "collecting Sandalwood to pay [his] debts" (Kuykendall 1965:234).

By the late 1800s most of upper Wai'anae had become grazing and lease lands. Even today there remains extensive field systems of *lo'i* terraces on the upland slopes. House sites and old *kula* field walls remain for the most part intact in the more *mauka* boundaries of Wai'anae Ranch. A missionary account reported that a hundred acres were still in *kalo* in Wai'anae Valley

in 1863 (McGrath et al. 1973:31). Without taking into account the yield, the fields destroyed by sugar cane, and ranch land, the remnant *lo'i* and kula fields in upper Wai'anae could have supported a significant population.

Invasive species like the *kiawe* and *koa haole* are plentiful along the lower slopes of the valley, and the lowland area just *mauka* of the project has sand dunes. In Mrs. Texeira's youth, she recalled the dense *kiawe* forests that blocked her view from along Wai'anae stream to the ocean. The *'ili* of Pāhoa was renowned for its coconut grove, having had many *niu* trees.

In addition, *mauka* sections of Wai'anae Ahupua'a, where terraces still remain, were intensively cultivated in *lo'i kalo* and *'uala* grown in *kula* terraced landscapes. It is likely that as the ranch lands encroached upland and the sugar plantation spread out in the lowlands that many residents would travel farther upland to cultivate and harvest *kalo*, *'uala*, and other cultivated foodstuffs. This increase in distance from cultivated uplands to fertile fishing grounds probably increased *mauka-makai* trade for a time. Ka'ala Farms, in the upland of Wai'anae, has begun to recultivate the land, planting native plants and rehabilitating some of the *lo'i kalo* for harvest.

Although industry and the built environment quickly reduced the cultivated landscape, plants and herbs collected by gathering still grew and do grow in many areas. Mrs. Edith Texeira, Mrs. Alice Greenwood, and Mr. Harris Hopfe mentioned types and uses of the various plants they would gather in the area: *ki heihei* was used for tea; *lau kahi* and *lau ki* was used for sores and for diabetes; *pōpolo* was used for cancer, for infant congestion and as a glue; *'uhaloa* was used for the tonsils; *naupaka* was ued by women during their *ma'i*, or menstrual cycle, and for sunburn or bee sting relief; new born *pipipi* for the mouth; *noni* was for arthritis; and the *'iwa'iwa hāuli* fern was pounded with *pa'akai* to make a poultice.

8.3 Marine and Freshwater Resources

Wai'anae Valley was and is the most well-watered valley on the west side of O'ahu, one of the few with annual and perennial flowing streams and numerous springs such as Olahua Stream, Kiko'o Stream and Kumaipo Stream, along with Punana'ula and Kaupuni streams. The uplands of Wai'anae were watered with over 30 springs or seeps (Cordy 2002:45), which fed the forests and the upland streams.

It was only recently that springs and streams in the uplands have been capped and diverted by the Board of Water Supply and the streams flowing out to the ocean at Pōka'ī are channelized. Mr. Fred Cachola remembers the abundance of *limu wāwae'iole* that grew at these *muliwai* (river mouth; pool near mouth of a stream, as behind a sand bar; oft brackish or fresh water) Several community members asserted that there are no more *limu wawae'iole* to be gathered on the shores of Pōka'ī anymore. They cited the changing watershed, and the installation on the Ma'ili-side of the bay, of a large sewer culvert spilling directly into the ocean as the main causes.

Accounts relayed to us by Mrs. Edith Texeira spoke of the tidal nature of the fish pond behind Nene'u Village; which was depressed *mauka*, behind the coastal dunes where the waters filled and ebbed with the tides.

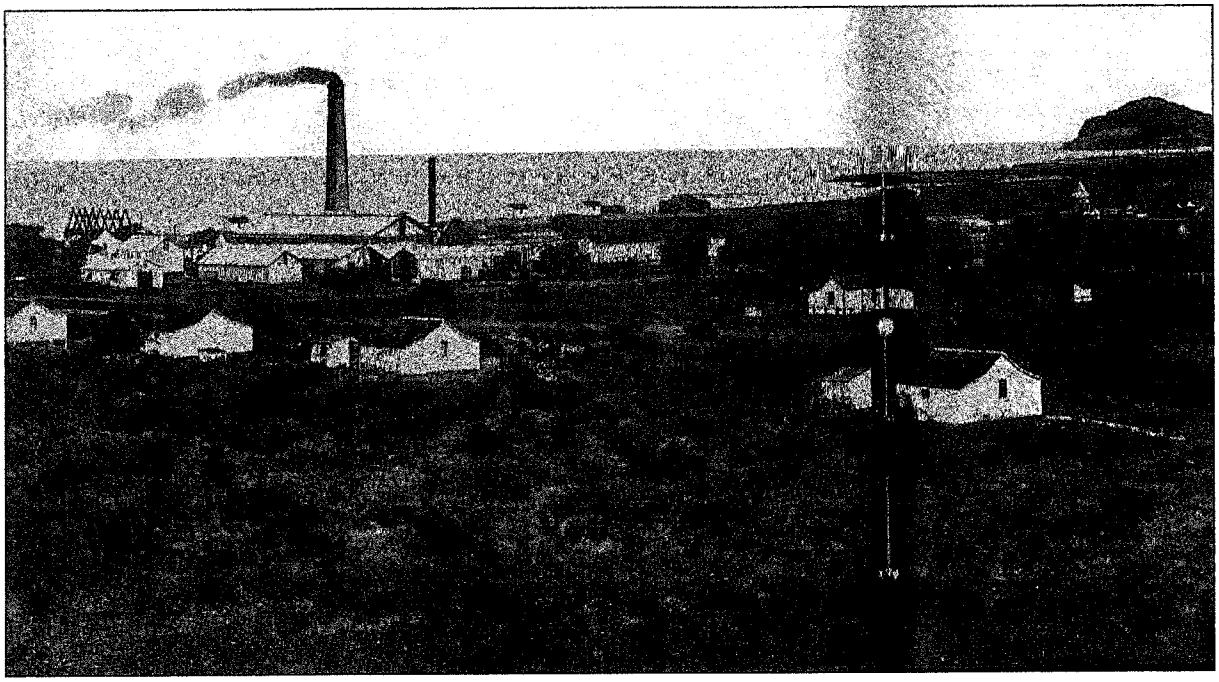


Figure 20. 1878-1880 photograph of Wai'anae town with the prominent sugar mill smokestack in left background; (photograph reprinted in McGrath 1973:40-41)

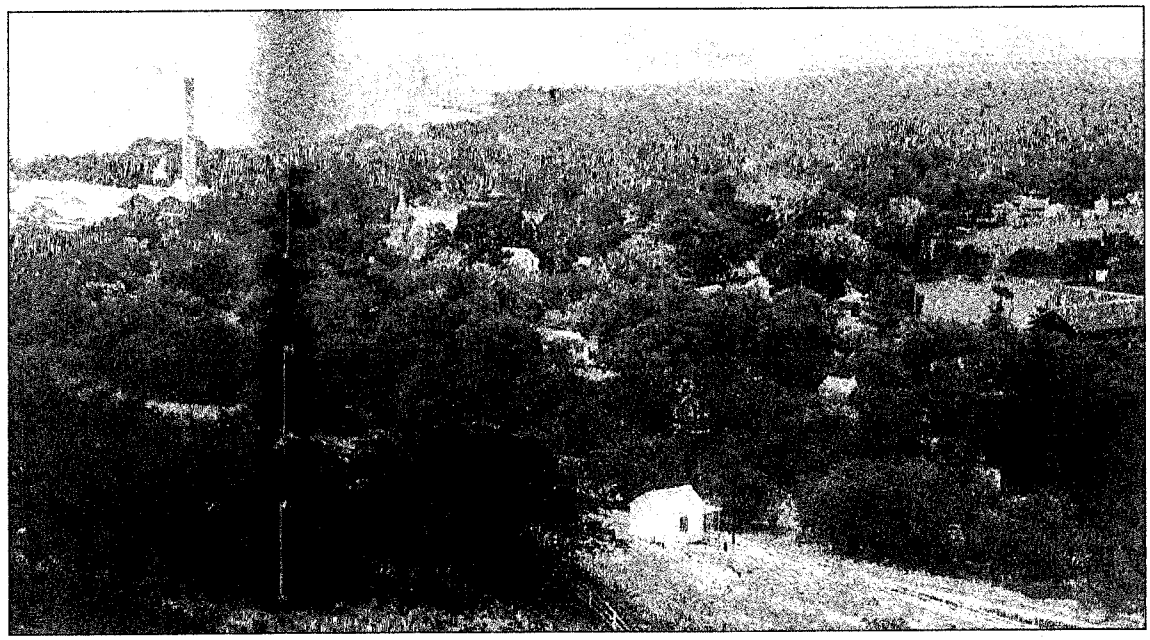


Figure 21. 1913 postcard view of Wai'anae town; note the dense *kiawe* tree cover around the town (photograph reprinted in McGrath 1973:88-89)

> During low flow periods, pools often formed behind the dunes which blocked the streams, and sometimes overflow would back up lineally behind the dunes, forming long narrow swamplands. (Cordy 2002:8)

The natural tidal flows in and out of the ponds allowed a healthy water acidity, which created an environment for fish cultivation until the channelization of streams and the construction of a breakwater in Pōka'ī altered the natural flow of water and stagnated the ponds. The altered coastal seascape, which included boat ramps, channelized streams, culverts, and breakwaters, had the side effect of causing sandy and silty build ups which clog stream mouths, create shallower stream beds, and inhibit water flow. In her interview, Mrs. Alice Greenwood described the drastic change in water levels at the mouths of the streams.

Puehu Fishpond is the only named pond we could find reference to in the project area, identified by Sterling and Summers (1978) as Site 154. Unlike the ponds around Nene'u village, Puehu was not affected by the tides (McAllister 1933:113). Sterling and Summers (1978:70) report that by 1954, Loko Puehu was "almost completely filled in."

Although the cultivated fishponds along the coast have become stagnant or filled with soil, the fishing offshore and in the bay remain plentiful for Hawaiians. Mrs. Alice Greenwood, Mrs. Edith Texeira, and Mr. Harris Hopfe pointed out a *kiawe* tree near the coast where weighted scales were hung by the fishermen of Nene'u to weigh their catches.

From the shores of Pōka'ī could be found *limu kohu, limu wāwae'iole, pipipi*, sharp quilled *wana, puka* shell, corals and cowry. Mrs. Edith Texeira, Mrs. Alice Greenwood, and Mr. Harris Hopfe all exclaimed about this bounty of the sea when they were younger, much of which is still available in the waters today, albeit greatly depleted. The community members we interviewed said you could catch *halalū, akule, moi, awa, he'e, manini* and a lot of *nehu* by throwing net off the rocks or spearing around Pōka'ī. The *nehu* was so plentiful at one time, that when they spawned Mrs. Texeira recalls them washing in with the waves, and flopping around as the water receded. An *ulua* was even said to have been caught occasionally in a well thrown net. *'Anae* and *manini* were also specified as fish that were caught off of the north side of the bay, near the old Dowsett Hotel.

8.4 Cultural and Historic Properties

Expanded settlement throughout the *ahupua'a* during the pre-Contact period has also presented itself in the number and variety of sites recorded during the first investigation of Wai'anae during the 1930s. McAllister (1933) noted sixteen sites within the *ahupua'a* including ten *heiau* (six of which had been recorded as destroyed), the Puehu fishpond, the Kawiwi fortress, and several house sites (see Figure 5). The sites extend well *mauka* into lands adjacent to streams at the head of Wai'anae Valley.

An adze quarry was located on the eastern ridge of the upper valley (Pāhe'ehe'e Ridge). Many of the basalt flakes and stone tools for farming and cultivating in the Wai'anae Ahupua'a would have been produced or cored here.

Just *mauka* of the project area and Kāne'īlio Point is Pāhe'ehe'e Ridge. Just inside the lower point of Pāhe'ehe'e is Pu'u Pāhe'ehe'e Heiau, which still stands today. Mr. Fred Cachola pointed

out that right below the Board of Water Supply water tank on this ridge is the *heiau*, and on the *makai* face of Pāhe'ehe'e are the remnants of an old *hōlua* slide.

The nineteenth century Hawaiian historian Samuel Kamakau recorded a wealth of oral traditions, some that associated Wai'anae *heiau* with prominent *ali'i* as mentioned previously. All of the community members that we interviewed referred to the presence and importance of the *heiau* at Kāne'īlio Point, Kū'īlioloa Heiau being situated prominently at the most *makai* end of this jutting landmass. The abundance of *heiau* recorded within Wai'anae Ahupua'a is evidence of its fertility for cultivation and its religious and political centrality within the district, as well as its association with the *ali'i. Heiau* in Wai'anae Ahupua'a included: Kū'īlioloa Heiau on the coast at Kāne'īlio Point; Pu'upāhe'ehe'e Heiau on Pāhe'ehe'e ridge; Keaupuni Heiau, which was destroyed and where the Dowsett hotel was built (McAllister 1933:114); Kamohoali'i/Kahoali'i Heiau at Pu'u Kāhea; Kunaiwa Heiau on Pu'u Kāhea; Haua Heiau on Pu'u Kāhea; Kamaile Heiau at the base of Kamaile'unu Ridge; Kāne I Kapua Lena Heiau; Kikahi Heiau; Kalamaluna Heiau; Malahakoa Heiau; Punana'ula Heiau; and, two other unknown named *heiau* in the upper valley of Wai'anae.

8.5 Trails

Wai'anae and Mākaha Uka are connected by a trail that was used in ancient days near the *mauka* end of Kawiwi ridge, a fortress that looked down on Kamaile sitting at the apex of the trail. It is unconfirmed if Kawiwi fortress still remains today, but considering its location it is likely to be in disrepair:

> The trail, Kumaipo, went down to the food patches of Makaha and the homes on that land. A branch of the trail went up the mountain that looked down on Waialua and Mokuleia where people could travel down to the flat and level lands. It was customary to have dwelling places along the mountain trails that lead downward from there into KaMā'ili , and also along the beach trail of Makaha. (Na hunahuna no ka mo'olelo Hawaii, Kuokoa Jan 1, 1870, translated in Sterling and Summers 1978:77)

The Kumaipo trail from Makaha over Kawiwi into Wai'anae might have connected with a long cliff road; Elou, from Kalena and Hale'au'au, on the east side of Ka'ala, coming down to Wai'anae. The Kumaipo Trail passes Kumaipo Heiau, which is still standing, A photograph of the *heiau* is on file at the Bishop Museum, and Fred Cachola has visited the *heiau* in the last decade.

8.6 Burials

In 1999, the current project area was part of a study conducted by Borthwick et al. (1999) for the Pōka'ī Bay Beach Park Expansion and Improvements Project. This 1999 study was divided into four sub-areas for a total of 34 sub-surface test units. The current project area was within sub-area 1 of that study and yielded no cultural or historic finds.

Based on archaeological reports in and around the project area, over 32 sets of *iwi kūpuna* (ancestral skeletal remains) were encountered in a ten-year span at the Wai'anae Army

Recreation Center (WARC): Kam and Ota (1984) reported two burials; archaeological monitoring (Riford 1984) during sewer line installation at the WARC unearthed five complete sets of *iwi kūpuna.* Hammatt et al. (1985) reported test-unit excavations identifying at least ten individual sets of remains; Schilz (1994) exposed 15 more sets of *iwi kūpuna* during an archaeological data recovery and intensive survey at the WARC.

The Wai'anae Police substation also borders Farrington Highway, along which other nearby projects have uncovered at least five other sets of *iwi kūpuna.*

When asked about her opinion regarding the upcoming project, Mrs. Edith Texeira expressed concerns about *iwi* that might be on the property, she recalled *iwi kūpuna* that had at one time been unearthed across the street from the project. Other than taking care of the *iwi kūpuna* in the area, Mrs. Texeira did not have any issues with the proposed redesign of the substation.

In regards to the proposed redesigns for the Wai'anae Police Substation, Mrs. Alice Greenwood's main concern was over *iwi kūpuna* that might be on the property. She mentioned that the McDonalds and KFC nearby was a cemetery and that other *iwi* had been found during developments near the beach.

8.7 Wahi Pana (Storied Places)

Hawaiian traditions centered on Wai'anae expand upon the area's significance and association with the *ali'i* in pre-Contact times. The district is a focus in the mythological cycles of Māui, Kamapua'a, and Kamohoali'i.

> Ku-'ilio-loa was the name of a legendary dog who was originally known in ancient times as a protector of travelers. Later on, the bad qualities of another dog were transferred to this dog so that he became known as evil which was not true at all. (Mary Kawena Pukui, June 21, 1954, in Sterling and Summers: 1978)

The pig demi-god, Kamapua'a, battled with the giant man-dog Kū-'īlio-loa (after whom the *heiau* in Wai'anae is named) and raised the taro patches of Wai'anae Valley. The people caught him, tied him up, and were preparing to sacrifice him when his many supernatural bodies swept over the plains, devouring the men of Wai'anae and sending them fleeing in terror (Fornander 1919, 5(2):332).

The older and favorite brother of Pele, Kamohoali'i, a brother of Pele, and famed *akua mano* (shark god), became enamored with a maiden of the Wai'anae coast and begot a half-man/half-*mano* child who lived at devoured many people before the being found out by the *waha mano* (shark mouth) on his back and subsequently captured and killed.

There are *puhi* (eel) scars along Kawiwi, the western *pali* of the valley. The scars are tied to a story about a *kupua* that could change from young man to *puhi.* In brief, the story went that a young man, a stranger came to Wai'anae. He was handsome and an accomplished fisherman who fell in love with and was permitted to marry a beautiful woman of Wai'anae who was coveted by many. The men of the area were jealous and it so happened that the woman grew thinner and sickly. The brother of the woman was advised by a *kahuna* of Nānākuli that the man was an eel, a *kupua*, and should be killed. When the men went to kill the young man, he changed into an eel,

and there was a great battle along the base of Kawiwi Ridge. The white scars on the bare rock of the *pali* are testament to his deaths throes where his body thrashed when it was beheaded.

> To the old Hawaiians this eel is known as Puhinalo, "the obliterated eel," and the mark on the pali wall is known as Kaoninapuhi, "the writhing eel." There is a place in Pokai Bay which is known as Halapoe or sometimes as Pohaku o Lapalapa, the place in the water where this eel lived. (McAllister: 1933:118-119)

The renowned prophet Ka'opulupulu was the *kahuna nui* who, during the time of the *mō'ī* Kahahana, presided over the nearby *heiau* at Pu'u Kāhea (across Pōka'ī Bay from and in view of Kū'īlioloa Heiau). It was at that end of the bay that Kaopulupulu prophesized the coming of a people over the sea and the loss of Hawai'i to land to those people. He was also the man who had tattooed on his knees in protest of Kahahana, who thought to give Kualoa to his uncle Kahekili; this is one of the mo'olelo for the naming of nearby *ahupua'a* of Nānākūli if the name is interpreted as "look to the knees."

A Bishop Museum Scrap Book (vol. 1931) identified Pōka'ī as once being a place of learning:

> The kilokilo hoku, or astrologers. To preserve the folk-lore of their homeland, Oahu, the exiled high class priests or kahunas founded a school at Pokai bay for instructing the youth of both sexes in history, astronomy, navigation. (reprinted in Sterling and Summers 1978:68)

Section 9 Summary and Recommendations

Cultural Surveys Hawai'i, Inc. (CSH) undertook this CIA at the request of Gerald Park Urban Planner. The cultural survey included broadly the entire Wai'anae Ahupua'a, and more specifically the Wai'anae District Police Substation, TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051) The proposed project area is bounded to the east by Farrington Highway, to the south by Wai'anae Valley Road, and to the west by Bayview Street and Pōka'ī Beach Park. The proposed Wai'anae District Station will be built in two phases:

Phase I proposes the construction of a two-story, 20,000-square-foot building (10,000 square feet per floor), fueling station, and parking for police vehicles, impound vehicles, and visitors. It also includes the replacement of the City's existing radio communications facility that shares the site. The radio facility improvements include a new radio tower (70 feet high measured from top to ground) and a 500-square-foot equipment building. Both will likely be located on top of the new two-story police station to avoid flood water inundation.

Phase II construction will add a two-story, 4,800-square-foot building (2,400 square feet per floor) to the east side of the Phase I building. When completed, the approximately 25,000-square-foot district station will accommodate patrol, investigative, and administrative units and associated support functions and facilities.

9.1 Results of Background Research

Background research on the project area and surrounding *ahupua'a* of Wai'anae indicates:

1. The project area is located in Wai'anae Ahupua'a, Wai'anae District, on the island of O'ahu, in TMK: [1] 8-5-008:040 por., 041, 043, 044 por., 051, bounded to the east by Farrington Highway, to the south by Wai'anae Valley Road, and to the west by Bayview Street and Pōka'ī Beach Park.
2. There are many legends associated with Wai'anae. It was said to have been the birthplace of the demi-god and trickster Māui (Fornander 1917:370) and the home of the pig-god Kamapua'a when he settled down to farm.
3. Wai'anae literally translates as "mullet water." Handy and Handy (1972:468) attribute the naming of Wai'anae to a large fresh water *loko* (pond, lake, pool) for mullet called Pueha [sic] (Puehu) located just inland of Pōka'ī Bay. *'Anae* refers to "full sized *'ama'ama* mullet fish" (Pukui and Elbert 1986:24).
4. Pōka'ī Bay is famous as a school for priests, navigators and astrologers. These activities may have been centered on the *heiau* of Kū'īlioloa.
5. There are two named fish ponds (*loko i'a*) within the *'ili* (land section, subdivision of an *ahupua'a*) of Pāhoa, Loko Puehu and Loko Lopoko, both are shown on an 1884 map of the Wai'anae Coast by George Jackson. One account notes that the Puehu Fishpond pond was almost completely filled in by 1954 (E.S., Feb 1954 in Sterling and Summers 1978:70).

6. McAllister (1933) noted 16 sites within the *ahupua'a* of Wai'anae, including ten *heiau* (shrine, high place of worship), seven of which had been recorded as destroyed, the Puehu Fishpond, the Kawiwi fortress, and several house sites (Figure 5). The abundance of *heiau* recorded within Wai'anae Ahupua'a reflects its fertility for cultivation and religious and political centrality within the district as well as its association with the *ali'i* or chiefly class.
7. Based on archaeological reports in and around the project area, over 32 sets of *iwi kūpuna* (ancestral skeletal remains) were encountered in a ten-year span at the Wai'anae Army Recreation Center (WARC): Kam and Ota (1984) reported two burials; archaeological monitoring (Riford 1984) during sewer line installation at the WARC unearthed five complete sets of *iwi kūpuna.* Hammatt et al. (1985) reported test-unit excavations identifying at least ten individual sets of remains; Schilz (1994) exposed 15 more sets of *iwi kūpuna* during an archaeological data recovery and intensive survey at the WARC.
8. After Kamehameha's death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the profitable sandalwood trade, resulting in an unrestrained demand on the stocks of the wood and upon the commoners who did the harvesting. By the middle of 1828, the stands of sandalwood above the Wai'anae coast may already have been depleted. Boki Kamauleule (made chief of Wai'anae by Kamehameha and also governor of O'ahu) supervised "collecting Sandalwood to pay [his] debts" (Kuykendall 1965:234).

9.2 Results of Community Consultation

CSH attempted to contact 22 individuals for this CIA (see Table 5); 12 responded; and four of those 12 *kūpuna* (elders) and/or *kama'āina* (native born) participated in formal "talk-story" interviews for more in-depth contributions to the CIA. To assist in discussion of natural and cultural resources and any cultural practices specific to the project area, CSH initiated the "talk-story" sessions with questions from five broad categories: Resource Gathering Practices, Marine and Freshwater Resources, Burials, Trails, and Historic Properties. Presented below are salient themes and concerns that emerged from participants' "talk-story" sessions about the proposed project area:

1. One participant expressed the significance of the Kū'īlioloa Heiau due to its prominent location along the shoreline. Mr. Cachola believes this *heiau* was the center locale for other cultural sites in the area noting that other cultural sites in the *ahupua'a* of Wai'anae have a direct line-of-sight to Kū'īlioloa Heiau thus making the *heiau* an important site for communication among the Hawaiian people.
2. Three participants recalled gathering various marine resources at Pōka'ī Bay during their youth such as *limu kohu (Asparagopsis taxiformis)*, *limu wāwae'iole (Codium edule)* as well as sharp-quilled *wana* (*Echinothrix diadema*). They also mention fishing for *halalū* (young *akule* five to six inches) and *akule* (big-eyed scad, *Trachurops crumenopthalmus*).
3. Three participants recalled plant gathering in the area for both medicinal purposes as well as for eating. Items gathered in their youth include *pōpolo* (*Solanum nigrum*), a plant with

dark berries, used to treat cancer; and *noni*, the Indian mulberry (*Morinda citrifolia*), used to treat arthritis.

4. Three participants are concerned for the potential unearthing of *iwi* (skeletal remains) during the ground disturbing activities associated with the proposed Wai'anae District Police Substation project. Participants are aware of past *iwi* discoveries in the vicinity of the project area and recommend the project proceed with caution and respect to *iwi kūpuna.*
5. One participant is concerned for the continued preservation of Kū'īlioloa Heiau for both ceremonial and educational purposes.
6. In a letter dated December 28, 2008, OHA mentioned the historic and cultural significance of Pōka'ī and the Kū'īlioloa Heiau at Kāne'īlio Point, and recommended several key community members of Wai'anae to consult for this project.
7. In a letter dated December 17, 2008, SHPD expressed concern for possible inadvertent discoveries of *iwi* due to the project's proximity to the shoreline at Pōka'ī. SHPD also described the historic and cultural significance of the Kū'īlioloa Heiau at Kāne'īlio Point.

9.3 Recommendations

Based on the information gathered from the community consultation effort as well as the archaeological and archival research documented in this report, recommendations are presented below to minimize the impact of the proposed Honolulu Police Department Wai'anae Substation Project on Hawaiian historic, natural and cultural resources and practices in Wai'anae Ahupua'a. A good faith effort to address the following recommendations would help mitigate the potentially adverse effects of the proposed project may have on Hawaiian cultural practices, beliefs and resources in and near the project area:

1. Cultural and archaeological monitoring should be conducted during all phases of construction.
2. Personnel involved in development activities in the project area should be informed of the possibility of inadvertent cultural finds, including human remains. Should cultural or burial sites be identified during ground disturbance, all work should immediately cease, and the appropriate agencies notified pursuant to applicable law.
3. View corridors between Kū'īlioloa Heiau and other cultural sites in the Wai'anae Ahupua'a, such as Pu'u Pāhe'ehe'e Heiau and Kamaile Heiau (see Figure 5), should not be obstructed. This will ensure the continued use of the *heiau* as a resource for the teaching of traditional navigation, wave currents and star studies.

Section 10 References Cited

Abordo, Eddy, Hualani Bodine, Alika Flores, Wanda Hamilton, Camille Laronal, Iokepa Lenchanko, Martin McCormack, Haines Rego, Makamae Choy and Ross Cordy
2001 *Archaeological Studies at Site 5706 Wai'anae Valley, O'ahu.* Wai'anae High School Hawaiian Studies Program, Wai'anae, O'ahu.

Ahlo, Hamilton M., Jr.
1980 *Cultural Resource Reconnaissance of the Proposed Wai'anae Agricultural Park, Wai'anae, O'ahu.* Hawaii Marine Resource, Inc., Honolulu, Hawai'i.

Andrews, Lorrin
1922 *A Dictionary of the Hawaiian Language.* Revised by Henry Parker. Board of Commissioners of Public Archives of the Territory of Hawai'i, Honolulu, Hawai'i.

Baker, Ray Jerome
n.d. Photograph of Pōka'ī Bay by Ray Jerome Baker. Original photograph at the Hawaiian Historical Society Library, 560 Kawaiaha'o Street, Honolulu, Hawai'i 96813. Reprinted in Robert E. Van Dyke and Ronn Ronck, 1982, *Hawaiian Yesterdays: Historic Photographs*, p. 220. Mutual Publishing Co., Honolulu, Hawai'i.

Barrera, William M., Jr.
1982 *Letter to Mr. Fred Proby, VTN Pacific*, Chiniago Inc., Kamuela, Hawai'i.

Beckwith, Martha W.
1940 *Hawaiian Mythology.* University of Hawai'i Press, Honolulu, Hawai'i.

Berdy, Catherine, Michelle Elmore, and Joseph Kennedy
2002 *An Archaeological Monitoring Report for the Farrington Highway Lighting Improvements Project Located in Wai'anae Kai and Lualualei Ahupua'a, Wai'anae District, Island of O'ahu.* Archaeological Consultants of the Pacific, Inc., Hale'iwa, Hawai'i.

Bernard, Russell H.
2006 *Research Methods in Anthropology: Qualitative and Quantitative Approaches.* Fourth Edition. AltaMira Press, Walnut Creek, California.

Bingham, Hiram
ca. 1821-1830 Sketch of the Waianae Coast, by Rev. Hiram Bingham. Original Sketch at the Hawaiian Mission Children's Society Library, 560 Kawaiaha'o Street, Honolulu, Hawai'i 96813. Reprinted in Roger C. Green, 1980, *Mākaha Before 1880 A.D*, p. 9. Pacific Anthropological Records No. 31, Department of Anthropology, Bernice P. Bishop Museum, Honolulu, Hawai'i.

Bordner, Richard M.
1981 *Archaeological Reconnaissance Wai'anae Water Main Replacement.* State Historic Preservation Division, Kapolei, Hawai'i.

Borthwick, Douglas F., Rodney Chiogioji, Hallett H. Hammatt,and David Shideler
1999 *Subsurface Archaeological Survey for the Proposed Pōka'ī Beach Park, Pōka'ī Bay, Wai'anae, O'ahu, Hawai'i. Revised.* Calvin Kim and Associates. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Borthwick, Douglas F., and Hallett H. Hammatt
1997 *Inadvertent Discoveries of Human Skeletal Remains, Church of Jesus Christ of Latter Day Saints (LDS), Pu'u Kāhea, Wai'anae, O'ahu Island Hawai'i, (TMK 8 5 03:25).* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Brown, Chad, Elijah Simpliciano, Krystle Tua, Leah Kanui, and Ross Cordy
2001 *Archaeological Studies at Site 5802 Wai'anae Valley, O'ahu* Wai'anae High School Hawaiian Studies Program. Wai'anae, O'ahu.

Bush, Anthony, and Hallett H. Hammatt
2004 *Letter Report: Hawaiian Electric Co. Job across from Wai'anae Elementary School (TMK 8-5-01).* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Chamberlain, Levi
1826 *Trip Around Oahu in 1826.* Manuscript on file at the Hawaiian Mission Children's Society Library, Honolulu, Hawai'i.

Chapman, Peter
1967 *Waianae Kai Pounder Workshop Area.* Manuscript on file at the Department of Anthropology, Bernice P. Bishop Museum, Honolulu, Hawai'i.

Ching, Francis
1978 *Examination of Approximately 10 acres at the Mauka end of Camp Ka'ala for Archaeological Sites, Wai'anae Valley, O'ahu.* Archaeological Research Center Hawai'i, Lāwa'i, Kaua'i, Hawai'i.

Clark, John R. K.
1977 *The Beaches of O'ahu.* University of Hawai'i Press, Honolulu, Hawai'i.

Clark, Stephan D., Dennis Gosser, and Richard Nees
2004 *Archaeological Inventory Survey for the Proposed Wai'anae Regional Park, Wai'anae Kai Ahupua'a, O'ahu, Hawai'i TMK 8-5-02:11.* Pacific Consulting Services, Inc., Honolulu, Hawai'i.

Cleghorn, Paul
1989 *Letter Report Regarding Archaeological Data Recovery Conducted at Site 50-80-07-3966.* Bernice P. Bishop Museum, Honolulu, Hawai'i.

Collins, Sara
1996 *A Skull and Some Knees: Human Remains Recovered by the Honolulu Police Department from a Wai'anae Resident in May 1995.* State Historic Preservation Division, Kapolei, Hawai'i.

Cordy, Ross
1999a *Archaeological Reconnaissance Survey Done Along Kumaipo Stream for the Wai'anae Wells, Wai'anae, O'ahu.* State Historic Preservation Division, Kapolei, Hawai'i.

1999b *Ka Moku O Wai'anae: He Mo'olelo O Ka Wa Kahiko*. State Historic Preservation Division, Kapolei, Hawai'i.

2000 *Studying the History of Wai'anae District on O'ahu: The 1997-2000 Wai'anae Valley Archaeological Field Projects of the Wai'anae High School Hawaiian Studies Program*. Wai'anae High School Hawaiian Studies Program, Wai'anae, O'ahu.

2001a *Waianae Valley Ranch Archaeological Survey, Wai'anae Ahupua'a, Moku o Wai'anae, O'ahu (TMK: 8-5-06:1)*. State Historic Preservation Division, Kapolei, Hawai'i.

2001b *Life in 1820-1850 in KaMā'ili 'Ili, Waianae Ahupua'a A Review of the Mahele Records*. State Historic Preservation Division, Kapolei, Hawai'i.

2002a *An Ancient History of Wai'anae: Ka Moku O Wai'anae: He Mo'olelo O Ka Wa Kahiko*. Mutual Publishing, Honolulu, Hawai'i.

2002b *Archaeological Investigations at Coastal Habitation Site (Site 4064) in Front of the Makaha Surfside Apartments, KaMā'ili 'Ili, Wai'anae Ahupua'a*. State Historic Preservation Division, Kapolei, Hawai'i.

Denham, Tim, Joseph Kennedy, and Laura Reintsema

1992 *Archaeological Inventory Survey With Subsurface Testing Report For A Property Located at TMK: 8 5 02 48, Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu*. Archaeological Consultants of Hawaii, Inc., Hale'iwa, Hawai'i.

Devereux, Thomas K., Rodney Chiojiogi, and Hallett H. Hammatt

1997 *Archaeological Reconnaissance Survey of the 55-Acre Freitas Dairy (TMK 8-5-04: 01, 58, and 41 por.)*. Cultural Surveys Hawai'i, Kailua, Hawai'i.

Douglas, Michele T.

1991 *Report on a Child's Skeleton Recovered from the Beach at Makaha Surfside Apartments*. State Historic Preservation Division, Kapolei, Hawai'i.

Douglas, Michele Toomay, and Michael Pietrusewsky

1988 *Human Remains at Makaha Beach, Makaha, O'ahu, TMK 8 5 17:08, Site 80 07 4064, Police Report, Medical Examiner's Report and Physical Anthropologist's Report*. University of Hawai'i, Honolulu, Hawai'i.

Elmore, Michelle, and Joseph Kennedy

2001 *An Archaeological Inventory Survey Report for the Wai'anae Coast Emergency Access Road, Wai'anae District, Island of O'ahu*. Archaeological Consultants of the Pacific, Inc., Hale'iwa, Hawai'i.

Emerson, Nathaniel B.

1915 *Pele and Hiiaka A Myth from Hawaii*. Revised edition. 'Ai Pōhaku Press, Honolulu, Hawai'i.

Environment Impact Study Corporation

1982 *Lower Wai'anae Well # 1 Walk Through Archaeological Reconnaissance, Wai'anae, O'ahu*. State Historic Preservation Division, Kapolei, Hawai'i.

Flood, Krista, Paul Christiaan Klieger, Susan A. Libo, Boyd Dixon, Stephan D. Clark and Scot Parry

1994 *An Archaeological Inventory Survey and Mitigation Plan of a Seven Acre Parcel (TMK: 8 5 28:Por. 42) in Wai'anae Kai Ahupua'a ,Wai'anae District, O'ahu Island, Hawai'i.* Department of Anthropology, Bernice P. Bishop Museum, Honolulu, Hawai'i.

Foote, Donald E., E.L. Hill, S. Nakamura, and F. Stephens

1972 *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii.* U.S. Department of Agriculture, U.S. Government Printing Office, Washington, D.C.

Foreign Register

1846-1848 Foreign Register of Kuleana Claims to Quiet Land Titles in the Hawaiian Islands, State of Hawai'i Archives, Honolulu, Hawai'i.

Foreign Testimony

1848-1853 Foreign Testimony of Kuleana Claims to Quiet Land Titles in the Hawaiian Islands, State of Hawai'i Archives, Honolulu, Hawai'i.

Fornander, Abraham

1917 *Fornander Collection of Hawaiian Antiquities and Folklore.* Memoirs of the Bernice Pauahi Bishop Museum, Vol. IV. Bernice P. Bishop Museum, Honolulu, Hawai'i.

1918-1919 *Fornander Collection of Hawaiian Antiquities and Folklore.* Memoirs of the Bernice Pauahi Bishop Museum, Vol. V. Bernice P. Bishop Museum, Honolulu, Hawai'i.

Giambelluca, Thomas W., Michael A. Nullet. and Thomas A. Schroeder

1986 *Rainfall Atlas of Hawai'i.* Department of Land and Natural Resources, Honolulu, Hawai'i.

Gora, Georgett, Shane Kaleleiki, Joseph Enaena, Jared Evans, Keoni Kahakelii, Olana Kamohalii, Makamae Choy and Ross Cordy

2000 *A Link to Our Future Through Our Past: Our Archaeological Studies at Site 5852, a House Site and its Irrigated Kalo Terraces in the Kumaipō Area of Wai'anae Valley.* Wai'anae High School Hawaiian Studies Program, Wai'anae, O'ahu.

Green, Laura C.S., and Mary K. Pukui

1936 *The Legend of Kawelo and Other Hawaiian Folktales.* Honolulu, Hawai'i.

Green, Roger C.

1980 *Mākaha Before 1880 A.D.* Pacific Anthropological Records No. 31, Department of Anthropology. Bernice P. Bishop Museum, Honolulu, Hawai'i.

Hammatt, Hallett H.

1985 *Archaeological Excavations at the Mauka End of Camp Ka'ala for Archaeological Sites, Wai'anae, O'ahu.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., Douglas F. Borthwick, and Rodney Chiogioji
1990 *Surface Archaeological Survey for the Proposed Pōka'i Bay Beach Park, Pōka'ī Bay, Wai'anae, O'ahu.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., Douglas F. Borthwick, and David Shideler
1985 *Archaeological Excavations at the Wai'anae Army Recreation Center, Pōka'ī Bay, Wai'anae, O'ahu.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

1987 *Archaeological Survey and Excavation of a Prehistoric Agricultural Complex (80-07-3200) – Wai'anae Valley Agricultural Park, Wai'anae, O'ahu.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Hammatt, Hallett H., and David Shideler
2001 *Archaeological Monitoring Plan for a Proposed Jack in the Box Restaurant at the North Corner of Bayview Street and Farrington Highway, Wai'anae Town, Wai'anae Ahupua'a, O'ahu (TMK: 8-5-11: 20, 21, 26).* Cultural Surveys Hawai'i, Kailua, Hawai'i.

2006 *Archaeological Inventory Survey for the Leeward Coast Emergency Homeless Shelter Project, Wai'anae Civic Center Location, Wai'anae Ahupua'a, Wai'anae District, O'ahu, TMK: [1] 8-5-028:041.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Handy, E.S. Craighill
1940 *The Hawaiian Planter Vol 1: His Plants, methods and Areas of Cultivation.* Bishop Museum Bulletin 161, Bishop Museum Press, Honolulu, Hawai'i.

Handy, E.S. Craighill ,and Elizabeth G. Handy
1972 *Native Planters in Old Hawai'i: Their Life, Lore, and Environment.* Bishop Museum Bulletin 233, Bishop Museum Press, Honolulu, Hawai'i.

Hawai'i TMK Service
2009 Tax Map Key [1] 8-5-008. On file at Hawai'i TMK Service, Honolulu, Hawai'i.

Hoku o Hawaii
1930 Na Anoai o Oahu Nei [Place Names of Oahu]. *Hoku o Hawaii*, Feb 11, 1970, p. 7. Hilo, Hawai'i.

Holt, Allen, Sam Kapoi, Angie Lino, Olana Kamohali'i, Moana Lee, and Ross Cordy
2002 *Archaeological Work at House Site, Site 5803, Wai'anae Valley, O'ahu.* Wai'anae High School Hawaiian Studies Program. Wai'anae, O'ahu.

Hommon, Robert J.
1978 *Wai'anae (Kamaile Complex), O'ahu 80 07 1181 and Ho'ohana Project, Wai'anae, O'ahu.* State Historic Preservation Division, Kapolei, Hawai'i.

Honolulu Advertiser, The
1978 *Wai'anae (Kamaile Complex), O'ahu 80 07 1181 and Ho'ohana Project, Wai'anae, O'ahu.* State Historic Preservation Division, Kapolei, Hawai'i.

Jackson, George E. Gresley

1884 *Waianae and Adjacent Coast Map.* Hawaiian Government Survey map by George E. Gresley Jackson, Registered Map Mo. 1348. On file at the Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu.

Jones, Kulani, and Hallett H. Hammatt

2003 *Archaeological Monitoring Report For the Mauna Lahilahi Shoreline Protection Project, Wai'anae Ahupua'a, Wai'anae, O'ahu (TMK: 8-5-017:005).* Cultural Surveys Hawai'i, Kailua, Hawai'i.

2005 *Archaeological Monitoring Report For the Maunalahilahi Beach Park Improvement Project, Wai'anae Ahupua'a, Wai'anae, O'ahu (TMK: 8-4-01:1; 8-5-17: 1-7 and 22, and 8-5-18: 1-3).* Cultural Surveys Hawai'i, Kailua, Hawai'i.

2006 *Archaeological Monitoring Report for the Board of Water Supply Water System Improvements on Wai'anae Valley Road and Connecting Streets, Wai'anae, O'ahu.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Jourdane, Elaine

1995 *Inadvertent Discovery of Human Skeletal Remains at Makaha Surfside Condominiums, Makaha, Wai'anae, O'ahu.* State Historic Preservation Division, Kapolei, Hawai'i.

Kaikala, Sam, Thomas Kaleiopu, Olana Kamohali'I, Kyle Medeiros, Miguel Perez, Marcus Langford and Ross Cordy

2001 *Archaeological Work at Site 5705 Upper Wai'anae Valley, Wai'anae Ahupua'a, O'ahu.* Wai'anae High School Hawaiian Studies Program, Wai'anae, O'ahu.

Kam, Wendell and Jason Ota

1984 *Burial Report Wai'anae Army Recreation Center, Wai'anae, O'ahu.* Division of State Parks, Department of Land and Natural Resources, Honolulu, Hawai'i.

Kamakau, Samuel Manaiakalani

1870 *Kamo'olelo O Hawai'i.*Volume I Chapter 1, Honolulu, Hawai'i.

1976 *The Works of the People of Old. Na Hana a ka Po'e Kahiko.* Bernice P. Bishop Museum Special Publication 61. Bishop Museum Press, Honolulu, Hawai'i.

1991 *Tales and Traditions of the People of Old: Nā Mo'oleleo a ka Po'e Kahiko.* Bishop Museum Press, Honolulu, Hawai'i.

1992 *Ruling Chiefs of Hawai'i.* Revised Edition. The Kamehameha Schools Press, Honolulu, Hawai'i.

Kame'eleihiwa, Lilikala

1996 *A Legendary Tradition of Kamapua'a, the Hawaiian Pig-God.* Bishop Museum Special Publication 89, Bishop Museum Press, Honolulu, Hawai'i.

Kapeliela, Kana'i

1997 *Inadvertently Discovered Human Remains at Corner of Lihue Street and Plantation Road in Wai'anae, O'ahu.* State Historic Preservation Division, Kapolei, Hawai'i.

Kawachi, Carol T.

1979 *Makaha Surfside Burial: Artifacts, KaMā'ili, Wai'anae O'ahu, TMK 8 5 17:005, State Site No. 80 07 4064.* State Historic Preservation Division, Kapolei, Hawai'i.

1992 *Burial Exposed by Hurricane Iniki, Waianae Regional Park, Waianae, Oahu, TMK 8 5 02:11.* State Historic Preservation Division, Kapolei, Hawai'i.

Kirch, Patrick, and Marshall Sahlins

1992 *Anahulu: The Anthropology of History in the Kingdom of Hawaii, Vol. I.* University of Chicago Press, Chicago, Illinois.

Kolb, Michael J., Patty Jo Conte, Michael McFadden, Christi A. Mitchell, and Ross Cordy

1995 *Archaeological Survey and excavations at Pāhe'ehe'e Ridge, Wai'anae Ahupua'a, Waianae, Oah.* State Historic Preservation Division, Kapolei, Hawai'i.

Komori, Eric

1987 *Archaeological Survey and Testing at Mauna Lahilahi, Wai'anae District, Island of O'ahu.* Department. of Anthropology, Bernice P. Bishop Museum, Honolulu, Hawai'i.

Kuykendall, Ralph

1965 *The Hawaiian Kingdom*, Vol I. Originally published in 1936. University of Hawai'i Press, Honolulu, Hawai'i.

1953 *The Hawaiian Kingdom*, Vol II. University of Hawai'i Press, Honolulu, Hawai'i.

Magnuson, Coral

2000 *Archaeological Reconnaissance for KaMā'ili Elementary School Expansion, Wai'anae, O'ahu.* International Archaeological Research Institute, Inc., Honolulu, Hawai'i.

Masse, W. Bruce

1989 *A Preliminary Reconnaissance of the Proposed Route for the Wai'anae Valley Gravity Sewer, Wai'anae, O'ahu.* Manuscript on file at the Department of Hawaiian Home Lands, Honolulu, Hawai'i.

Mays, Nicholas and Catherine Pope

1995 Rigour and qualitative research. *British Medical Journal* 311:109–112.

McAllister, J. Gilbert

1933 *Archaeology of Oahu.* Bishop Museum Bulletin 104, Bishop Museum Press, Honolulu, Hawai'i.

McGrath, Edward J., Kenneth M. Brewer and Bob Krauss

1973 *Historic Waianae: A Place of Kings.* Island Heritage Limited, Honolulu, Hawai'i.

Monsarrat, M. D.

n.d. *Waianae, Oahu Map.* Map by M. D. Monsarrat, probably dating to ca.1875-1900. Map traced in 1902, Original Map Registered Map No. 600; Traced 1902 map, Registered Map No. 2108. On file at the Hawai'i Land Survey Division, Department of Accounting and General Services, Honolulu, Hawai'i.

Mouritz, A.
1931 *Thermal Terrene Waters in Hawaii Nei*, July 5, 1934, p. 128. Bishop Museum Scrap Book Vol. 1931. Portion reprinted in Elspeth P. Sterling and Catherine C. Summers, 1978, *Sites of Oahu*, p. 68. Bishop Museum Press, Honolulu, Hawai'i.

Native Register
1846-1848 Native Register of Kuleana Claims to Quiet Land Titles in the Hawaii Islands, State of Hawai'i Archives, Honolulu, Hawai'i

Native Testimony
1846-1852 Native Testimony of Kuleana Claims to Quiet Land Titles in the Hawaii Islands, State of Hawai'i Archives, Honolulu, Hawai'i.

Neller, Earl
1982 *An Archaeological Reconnaissance Survey in a Portion of Wai'anae Kai, O'ahu.* State Historic Preservation Division, Kapolei, Hawai'i.

Nogelmeier, M. Puakea
2006 *The Epic Tale of Hi'iakaikapoliopele.* As Told by Ho'oulumāhiehie. Translated by M. Puakea Nogelmeier. Awaiaulu Press, Honolulu, Hawai'i.

Ota, Jason
1981 *Archaeological Field Report: Waianae Water Well Site for the Honolulu Board of Water Supply, Waianae, Oahu.* Division of State Parks, Department of Land and Natural Resources, Honolulu, Hawai'i.

Perzinski, David, and Hallett H. Hammatt
2004 *Archaeological Inventory Survey Report for Proposed Improvements at Mauna Lahilahi Beach Park in the Ahupua'a of Wai'anae, District of Wai'anae, Island of O'ahu.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

Pukui, Mary K., and Samuel H. Elbert
1986 *Hawaiian Dictionary.* University of Hawai'i Press, Honolulu, Hawai'i.

Pukui, Mary K., Samuel H. Elbert, and Esther Mookini
1974 *Place Names of Hawai'i.* University of Hawai'i Press, Honolulu, Hawai'i.

Riford, Mary F.
1984 *Report of Archaeological Consulting Services During Repair of Sewer Lines and Replacement of Water Main Lines at Wai'anae Army Recreation Center, O'ahu, Hawaii.* Department of Anthropology, Bernice P. Bishop Museum, Honolulu, Hawai'i.

Rosendahl, Paul H.
1981 *Archaeological Reconnaissance Survey of the Wai'anae Valley Road Improvements Alignment, Wai'anae, O'ahu.* Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Rosendahl Paul H., and Margaret Rosendahl
1973 *Wai'anae Kai Silting Pond Complex.* Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Schilz, Allan J.

1994 *Subsurface Archaeological Intensive Survey and Data Recovery and Construction Monitoring and Sampling at Wai'anae Army Recreation Center (WARC), Wai'anae, O'ahu Island, Hawai'i.* Ogden Environmental and Energy Services Co., Inc., Honolulu, Hawai'i.

Schmitt, Robert C.

1973 *The Missionary Censuses of Hawaii.* Department of Anthropology, Bernice P. Bishop Museum, Honolulu, Hawai'i.

1977 *Historical Statistics of Hawaii.* University of Hawai'i Press, Honolulu, Hawai'i.

Shapiro, William, and Paul H. Rosendahl

1988 *Archaeological Reconnaissance Survey and Limited Subsurface Testing Waianae Kai Property.* Paul H. Rosendahl, Ph.D., Inc., Hilo, Hawai'i.

Shun, Kanalei, and Christi Shaw

2002 *Results of Archaeological Monitoring and Sampling During Installation of Grease Trap Interceptor and Modification of Existing Plumbing Line, Building 4065, U. S. Army Recreation Center, O'ahu Island, Hawai'i.* U.S. Army.

Sinoto, Akihiko

1975a *Archaeological Reconnaissance Survey of the Wai'anae Light draft Harbor Project Site, Wai'anae O'ahu.* Manuscript on file at the Bernice P. Bishop Museum, Honolulu, Hawai'i.

1975b *Field Inspection of Site 50 Oa C3 22; An Enclosure in Wai'anae Valley, O'ahu.* Manuscript on file at the Bernice P. Bishop Museum, Honolulu, Hawai'i.

1978 *Reassessment of 10 Acres in Wai'anae Valley, Island of O'ahu.* Manuscript on file at the Bernice P. Bishop Museum, Honolulu, Hawai'i.

1979 *Archaeological Reconnaissance Survey of Proposed Water Well, Waianae,O'ahu, Hawaii.* Manuscript on file at the Bernice P. Bishop Museum, Honolulu, Hawai'i.

Social Research Systems Co op

1988 *Wai'anae Wells I and II: Initial Cultural Resources Reconnaissance, Wai'anae, O'ahu.* Manuscript on file at the State Historic Preservation Division, Kapolei, Hawai'i.

1989 *Preliminary Archaeological Monitoring Reconnaissance of Wai'anae Wells I and II, Construction Phase I.* Manuscript on file at the State Historic Preservation Division, Kapolei, Hawai'i.

Soehren, Lloyd

2009 *Hawaiian Place Names database.* On line at http//ww.ulukau.org. Downloaded June 1, 2009.

State Historic Preservation Division

2009 *State Inventory of Historic Propoerties #3967.* On file at the State Historic Preservation Division, Kapolei, Hawai'i.

Sterling, Elspeth P.,and Catherine C. Summers (comp.)

1978 *Sites of O'ahu.* Department of Anthropology, Bishop Museum Press, Honolulu, Hawai'i.

Stearns, Harold T.

1940 *Geology and Ground-water Resources of the Island of Oahu, Hawaii.* Bulletin 5, Division of Hydrography, Territory of Hawaii, Honolulu, Hawai'i.

Tao, G.K., M. Kelly, and S. Abe

1979 *Archaeological Research for the Kū'īlioloa Heiau Restoration Project, Pōka'ī, Wai'anae, O'ahu.* Bernice P. Bishop Museum, Honolulu, Hawai'i.

Thrum, Thomas G.

1907 Heiaus and Heiau Sites throughout the Hawaiian Islands. *The Hawaiian Almanac and Annual for 1907*, pp. 36-48. Thomas G. Thrum, Honolulu, Hawai'i.

1909 Heiaus and Heiau Sites throughout the Hawaiian Islands. *The Hawaiian Almanac and Annual for 1909*, pp. 38-43. Thomas G. Thrum, Honolulu, Hawai'i.

1922 Hawaiian Place Names. In Lorrin Andrews, 1922, *A Dictionary of the Hawaiian Language*, pp. 625-674. Board of Commissioners of Public Archives of the Territory of Hawaii, Honolulu, Hawai'i.

1931 The Lure of Waianae, by an anonymous contributor. In *Hawaiian Almanac and Annual for 1931*, pp. 108-112. Thomas G. Thrum, Honolulu, Hawai'i.

Tulchin, Todd, and Hallett H. Hammatt

2004 *Archaeological Monitoring Report for BWS Farrington Highway Part III Project, Jade Street to Kaulawaha Road, Mākaha and Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu.* Cultural Surveys Hawai'i, Kailua

2007 *An Archaeological Inventory Survey for the Spotkaeff House Project, Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu, TMK: (1) 8-5-002:025.* Cultural Surveys Hawai'i, Kailua, Hawai'i.

U.S. Army Mapping Service

1950s U.S. Army Mapping Service 7.5 minute topographic map, Wai'anae Quad. Available at USGS Information Services, Box 25286, Denver, Colorado.

U.S. Geological Survey

1998 U.S. Geological Survey 7.5 minute topographic map, Wai'anae Quad. Available at USGS Information Services, Box 25286, Denver, Colorado.

1928/9 U.S. Geological Survey 7.5 minute topographic map, Wai'anae and Kaena Quads. Available at USGS Information Services, Box 25286, Denver, Colorado.

2005 U.S. Geological Service Orthoimagery, Wai'anae Quad (Aerial photograph). Available at USGS Information Services, Box 25286, Denver, Colorado.

U.S. War Department

1919 U.S. War Department 7.5 minute topographic map, Wai'anae and Nankuli Quads. Available at USGS Information Services, Box 25286, Denver, Colorado.

1943 U.S. War Department 7.5 minute topographic map, Wai'anae and Nankuli Quads. Available at USGS Information Services, Box 25286, Denver, Colorado.

Van Dyke, Robert E., and Ronn Ronck

1982 *Hawaiian Yesterdays: Historic Photographs*, by Ray Jerome Baker. Edited by. Robert E. Van Dyke, Text by Ronn Ronck, Mutual Publishing Co., Honolulu, Hawai'i.

Vancouver, George

1798 *A Voyage of Discovery to the North Pacific Ocean and Round the World Performed in the Years 1790-95.* Volume 3. G.G. and J. Robinson and J. Edwards, London, England.

Waihona 'Āina

2008 The Māhele Database. Electronic document, http://waihona.com, accessed November 18, 2008.

Yent, Martha, and Agnes Griffin

1979 *Archaeological Reconnaissance Survey of Water Well and Access Road Project in Waianae Valley, Oahu.* Division of State Parks, Department of Land and Natural Resources, Honolulu, Hawai'i.

APPENDIX B

Traffic Impact Report for the Proposed
Wai'anae Police Station Redevelopment

TRAFFIC IMPACT REPORT

FOR THE PROPOSED

WAIANAE POLICE STATION REDEVELOPMENT

Prepared for:

Bill Chang, AIA
1976 Judd Hillside Road
Honolulu, Hawaii 96822

Prepared by:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #7955-01

June 2009

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF APPENDICIES

I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the redevelopment of Waianae Police Station on the island of Oahu. The proposed project entails the redevelopment of the existing police station facilities to create a new district-level station.

B. Scope of Study

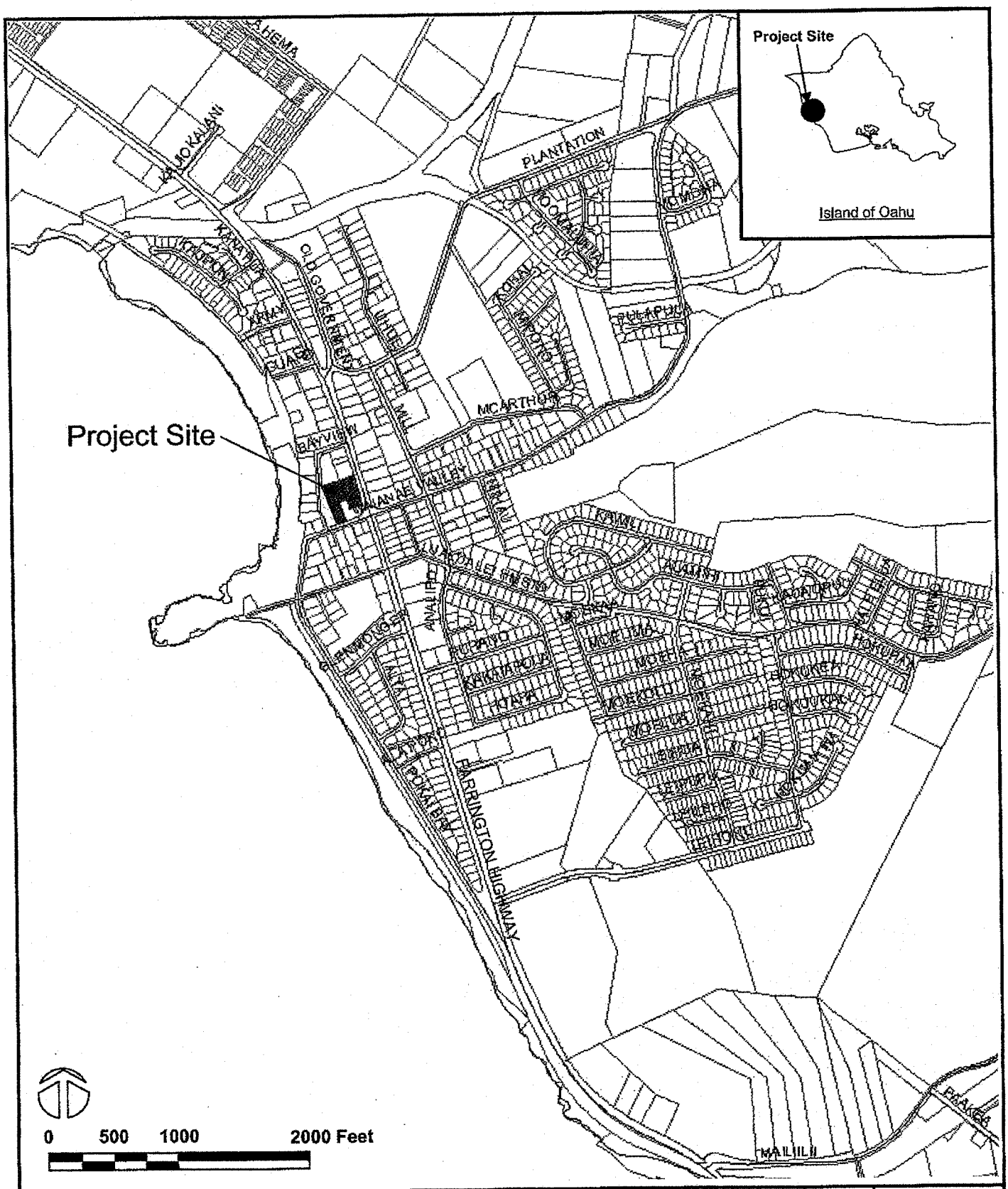
This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Analysis and development of trip generation characteristics for the proposed project.
5. Superimposing site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

II. PROJECT DESCRIPTION

A. Location

The existing Waianae Police Station is located along Farrington Highway near the intersection with Waianae Valley Road in Waianae on the island of Oahu (see Figure 1). The existing site consists of two adjacent land parcels and which are further identified as Tax Map Keys: 8-5-008:051 and 43. The proposed redevelopment will include the expansion to three vacant adjacent parcels further identified as TMKs: 8-5-008:040, 41 and 44. Access to the redeveloped police station will continue to be provided via two driveways off Farrington Highway with a new driveway provided off Waianae Valley Road.



WILSON OKAMOTO CORPORATION
ENGINEERS - PLANNERS

WAIANAE POLICE STATION

LOCATION MAP AND VICINITY MAP

FIGURE 1

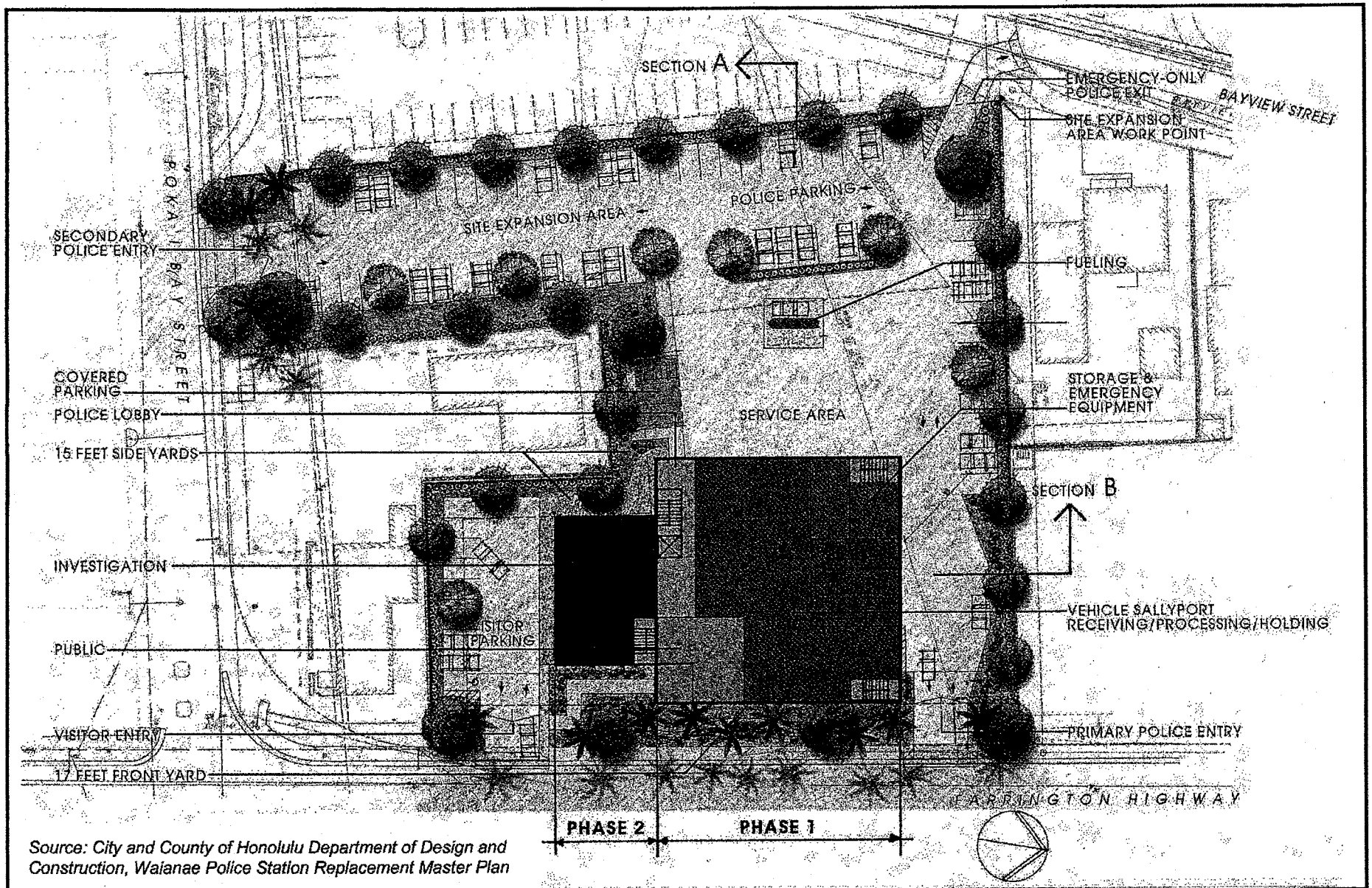
B. Project Characteristics

The existing police station is an approximately 7,000 square foot facility located adjacent to Farrington Highway. The Honolulu Police Department (HPD) plans to upgrade the existing substation facility to a district station. The proposed project will be constructed in two phases, the first of which is expected to include:

- An approximately 19,000 square foot, two-story building that will include a receiving, booking, and holding area, as well as, office, meeting, and training areas
- 9-stall visitor parking lot
- 72-stall employee parking lot
- Radio communication facilities
- Fuel station facilities

Phase 1 is expected to be completed by the Year 2012 with Phase 2 expected to be completed by the Year 2019. Phase 2 includes the construction of a 5,200 square foot, two-story addition to the Phase 1 building. Access to the visitor parking lot will be provided via an existing driveway off Farrington Highway near the south-end of the project site. Access to the employee parking lot will be provided off Farrington Highway via an existing driveway near the north-end of the project site and a new driveway off Waianae Valley Road. The driveway along Waianae Valley Road will have controlled access with traffic controlled by an automated card swipe system. Figure 2 shows the proposed project site plan.

It should be noted that in the City and County of Honolulu Department of Parks and Recreation's (DPR) Pokai Bay Beach Park Master Plan includes the expansion of the beach park's parking lot adjacent to the project site. This results to the truncation of Bayview Street and the creation of a cul-de-sac at the new terminus point of the roadway. A new emergency exit driveway connection from the police station to the proposed Bayview cul-de-sac is expected to be constructed when the master plan improvements are completed. Since the timeline for the implementation of the Pokai Bay Beach Park Master Plan improvements are not known at this time,



Source: City and County of Honolulu Department of Design and Construction, Waianae Police Station Replacement Master Plan

WILSON OKAMOTO CORPORATION
ENGINEERS - PLANNERS

WAIANAE POLICE STATION

Project Site Plan

FIGURE 2

the proposed emergency driveway for the police station is not incorporated into projected conditions.

III. EXISTING TRAFFIC CONDITIONS

A. General

The project site is located adjacent to Farrington Highway north of Waianae Valley Road. Farrington Highway is a predominately two-lane, two-way State of Hawaii roadway generally oriented in the north-south direction that serves as the main access route along the Waianae coast.

B. Area Roadway System

Adjacent to the project site, Farrington Highway intersects Waianae Valley Road. At this signalized intersection, the northbound and southbound approaches of the highway have shared through and left-turn lanes and shared through and right-turn lanes. Waianae Valley Road is a two-lane, two-way roadway generally oriented in the east-west direction. At the intersection with Farrington Highway, the Waianae Valley Road approaches have one lane that serves all traffic movements.

North of Waianae Valley Road, Farrington Highway intersects Bayview Street. Bayview Street is a two-lane, two-way roadway between Farrington Highway and Waianae Valley Road. At this unsignalized T-intersection, the northbound approach of Farrington Highway has one through lane and one shared left-turn and through lane while the southbound approach has one through lane and one shared right-turn and through lane. The Bayview Street approach has one eastbound lane that serves left-turn and right-turn traffic movements. West of the intersection with Farrington Highway, Waianae Valley Road intersects Bayview Street. At this unsignalized T-intersection, the eastbound approach of Waianae Valley Road has a shared left-turn and through lane while the westbound approach has a shared right-turn and through lane. The Bayview Street approach has one southbound lane that serves left-turn and right-turn traffic movements.

C. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted on February 24-25, 2009 and consisted of manual turning movement count surveys along Farrington Highway and Waianae Valley Road in the project vicinity. The manual turning movement count surveys were conducted between the morning peak hours of 5:30 AM and 8:30 AM, and the afternoon peak hours of 3:00 PM and 6:00 PM at the following intersections:

- Farrington Highway and Waianae Valley Road
- Farrington Highway and the existing police station driveways
- Farrington Highway and Bayview Street
- Waianae Valley Road and Bayview Street

Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Highway Capacity Software", developed by the Federal Highway Administration. The analysis is based on the concept of Level of Service (LOS).

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand

exceeds the road's carrying capacity. The LOS definitions are included in Appendix B.

2. Existing Peak Hour Traffic

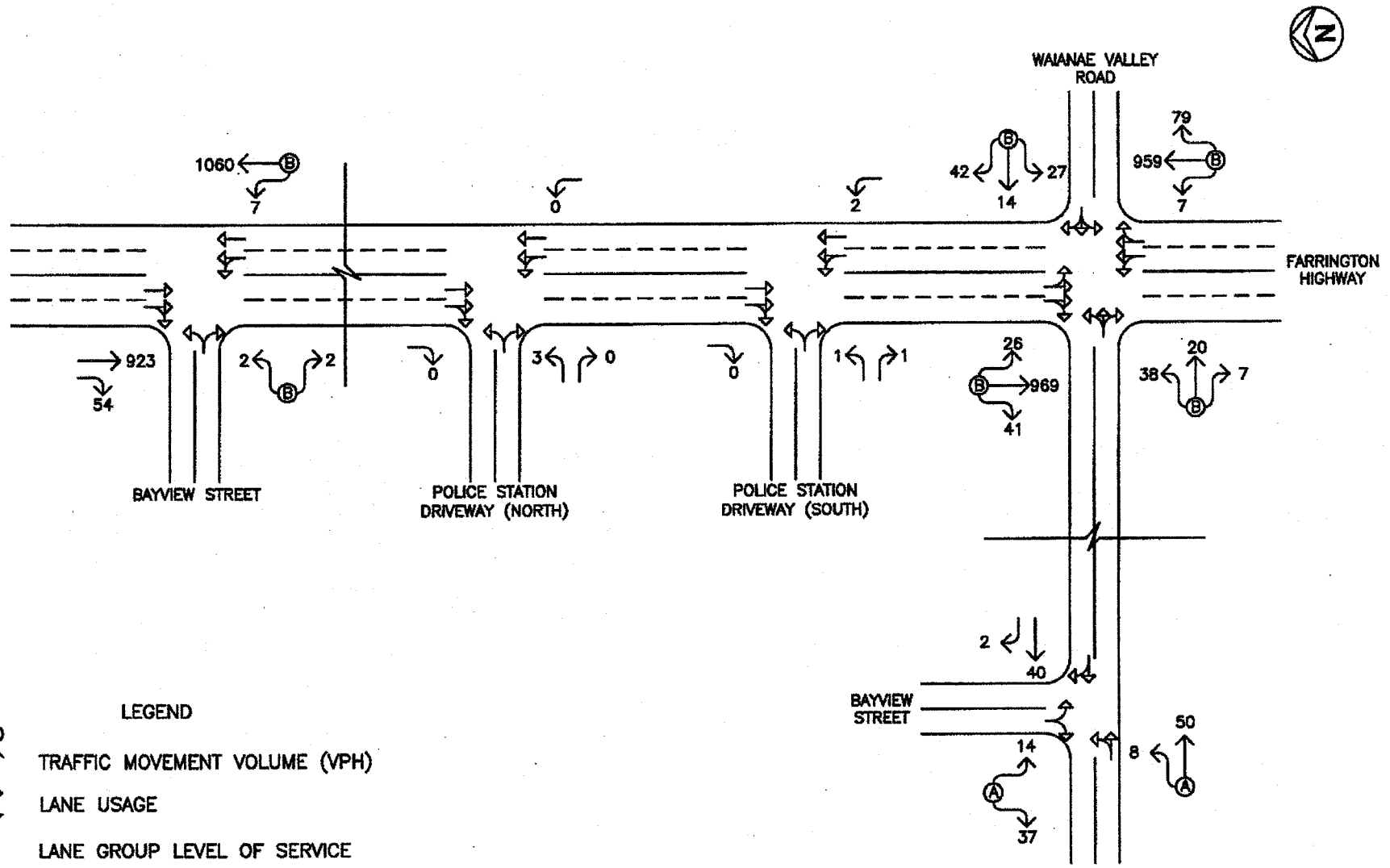
a. General

Figures 3 and 4 show the existing AM and PM peak hour traffic volumes and operating traffic conditions. The AM peak hour of traffic generally occurs between 7:15 AM and 8:15 AM in the vicinity of the proposed project. In the afternoon, the PM peak hour of traffic generally occurs between the hours of 3:00 PM and 4:00 PM. The analysis is based on these peak hour time periods to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

b. Farrington Highway and Waianae Valley Road

At the intersection with Waianae Valley Road, Farrington Highway carries 1,045 vehicles northbound and 1,036 vehicles southbound during the AM peak hour of traffic. During the PM peak hour, traffic volumes are similar with 1,164 vehicles traveling northbound and 927 vehicles traveling southbound. The northbound and southbound approaches of the highway operate at LOS "B" during the both peak periods. Vehicular queues periodically formed on the approaches of the highway. The most significant queuing occurred on the northbound approach during the PM peak period with average queue lengths of 8-10 vehicles observed. However, these queues were observed to clear the intersection after each traffic signal cycle change.

The Waianae Valley Road approach of the intersection carries 65 vehicles and 82 vehicles eastbound during the AM and PM peak hours of traffic, respectively, and operates at LOS "B" during both peak periods. The westbound approach of the intersection carries 83 vehicles and 132 vehicles during the AM and PM peak hours of traffic, respectively, and operates at LOS "B" during both peak periods of

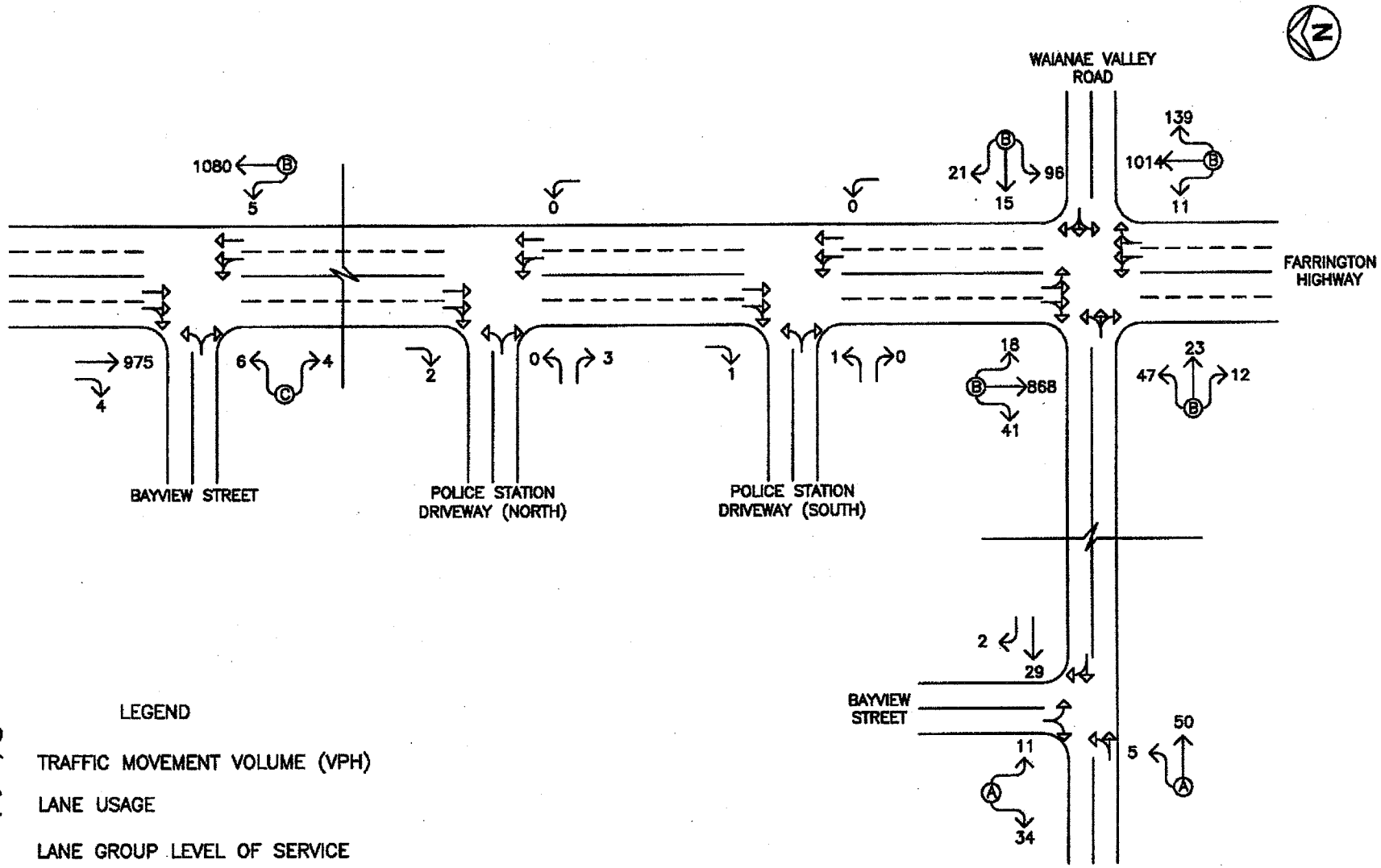


WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

EXISTING AM PEAK HOUR OF TRAFFIC

FIGURE 3



WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

EXISTING PM PEAK HOUR OF TRAFFIC

FIGURE 4

traffic. Traffic queues periodically formed on the Waianae Valley Road approaches with average queue lengths of 3-5 vehicles observed during both peak periods. These queues were observed to clear the intersection after each traffic signal cycle change.

c. Farrington Highway and Bayview Street

At the intersection with Bayview Street, Farrington Highway carries 1,067 vehicles northbound and 977 vehicles southbound during the AM peak hour of traffic. During the PM peak hour, the overall traffic volume is higher with 1,085 vehicles traveling northbound and 979 vehicles traveling southbound. The northbound approach traffic movements operate at LOS "B" during both peak periods.

The Bayview Street approach of the intersection carries a low volume of traffic during both peak periods with 4 vehicles and 10 vehicles eastbound during the AM and PM peak hours of traffic, respectively. This approach operates at LOS "B" and LOS "C" during the AM and PM peak period, respectively.

d. Waianae Valley Road and Bayview Street

At the intersection with Bayview Street, Waianae Valley Road carries 42 vehicles westbound and 58 vehicles eastbound during the AM peak period. During the PM peak period, traffic volumes are less with 31 vehicles traveling westbound and 55 vehicles traveling eastbound. Both the approaches of this intersection operate at LOS "A" during both peak periods.

The Bayview Street approach of the intersection carries 51 vehicles and 45 vehicles southbound during the AM and PM peak periods, respectively. The southbound approach of the intersection operates at LOS "A" during both peak periods.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trips generated by the proposed Waianae Police Station redevelopment were determined based upon the anticipated number of employees and visitors. The police station is staffed 24 hours a day, seven days a week with 3 work shifts per day and 30 employees per shift. For the purpose of this report, shift changes are conservatively assumed to occur during the AM and PM peak periods.

The total number of visitor-related trips to/from the site was based upon the provided number of visitor parking stalls (9 stalls). The visitor parking lot is assumed to be 100% occupied with all stalls conservatively assumed to turn over during the AM and PM peak periods. Table 1 summarizes the project site trip generation characteristics applied to the AM and PM peak hours of traffic to measure the impact resulting from the redeveloped Waianae Police Station.

Table 1: Peak Hour Trip Generation

EMPLOYEES		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	30
	EXIT	30
	TOTAL	60
PM PEAK	ENTER	30
	EXIT	30
	TOTAL	60
VISITORS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	9
	EXIT	9
	TOTAL	18
PM PEAK	ENTER	9
	EXIT	9
	TOTAL	18

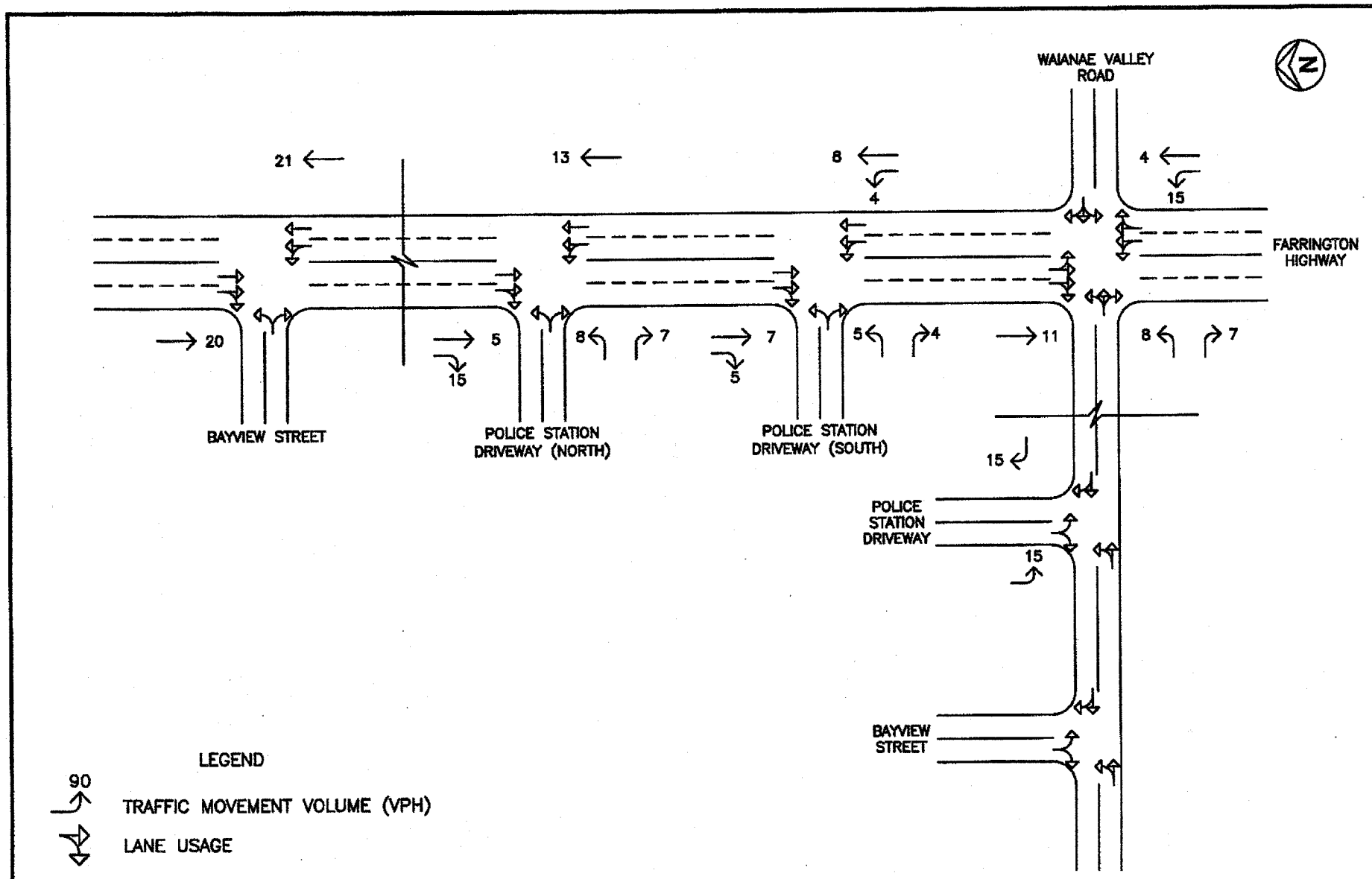
Table 1: Peak Hour Trip Generation (Cont'd)

TOTALS		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	39
	EXIT	39
	TOTAL	78
PM PEAK	ENTER	39
	EXIT	39
	TOTAL	78

2. Trip Distribution

Figures 5 and 6 show the distribution of site-generated vehicular trips at the study intersections during the AM and PM peak hours of traffic. Access to the proposed project will continue to be provided via the two existing driveways along Farrington Highway, as well as a new driveway off Waianae Valley Road. The directional distribution of site-generated vehicles was based upon the prevailing directional distribution of traffic along Farrington Highway. As such, 49.6% of the vehicles were assumed to be traveling northbound during the AM peak period while 50.4% were assumed to be traveling southbound. During the PM peak period, 50.9% were assumed to be traveling northbound while 49.1% were assumed to be traveling southbound.

Employee-related trips were distributed between the two driveways for the employee parking lot, one along Farrington Highway and one along Waianae Valley Road. All entering trips from the north were assumed to utilize the driveway along Farrington Highway, while the entering trips from the south were assumed to utilize the driveway along Waianae Valley Road. All exiting trips were distributed between the two driveways based upon the relative distribution of parking stalls within the parking lot. As such, 50% of vehicles exiting the site are assumed to utilize the driveway along Farrington Highway while 50% are assumed to utilize the driveway along Waianae Valley Road. With regards to visitor-related trips, all entering and exiting

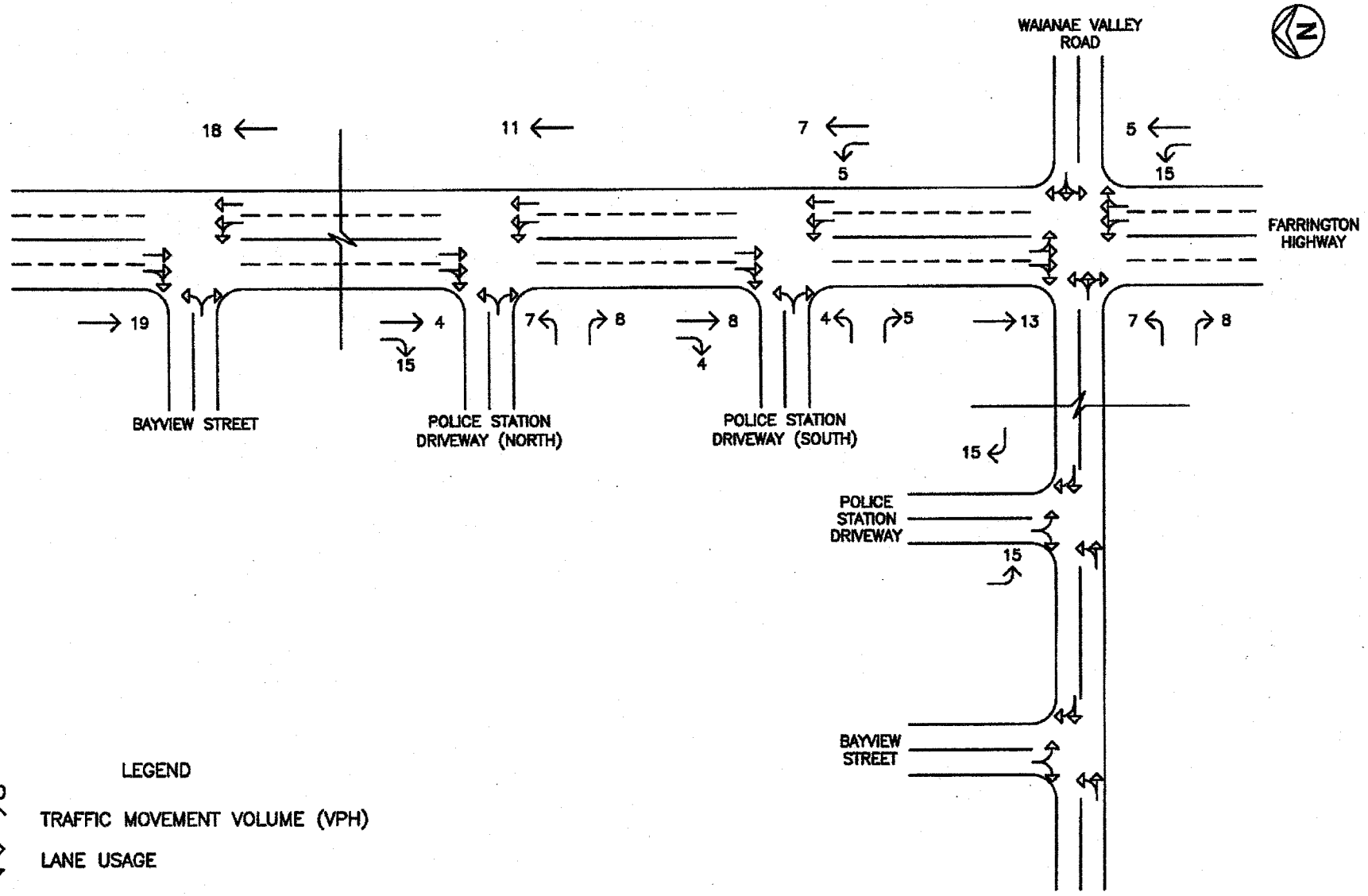


WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

DISTRIBUTION OF SITE-GENERATED VEHICLES AM PEAK HOUR OF TRAFFIC

FIGURE 5



WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

DISTRIBUTION OF SITE-GENERATED VEHICLES PM PEAK HOUR OF TRAFFIC

FIGURE 6

trips were assumed to access the visitor parking lot via the existing driveway along Farrington Highway near the south-end of the project site.

B. Through Traffic Forecasting Methodology

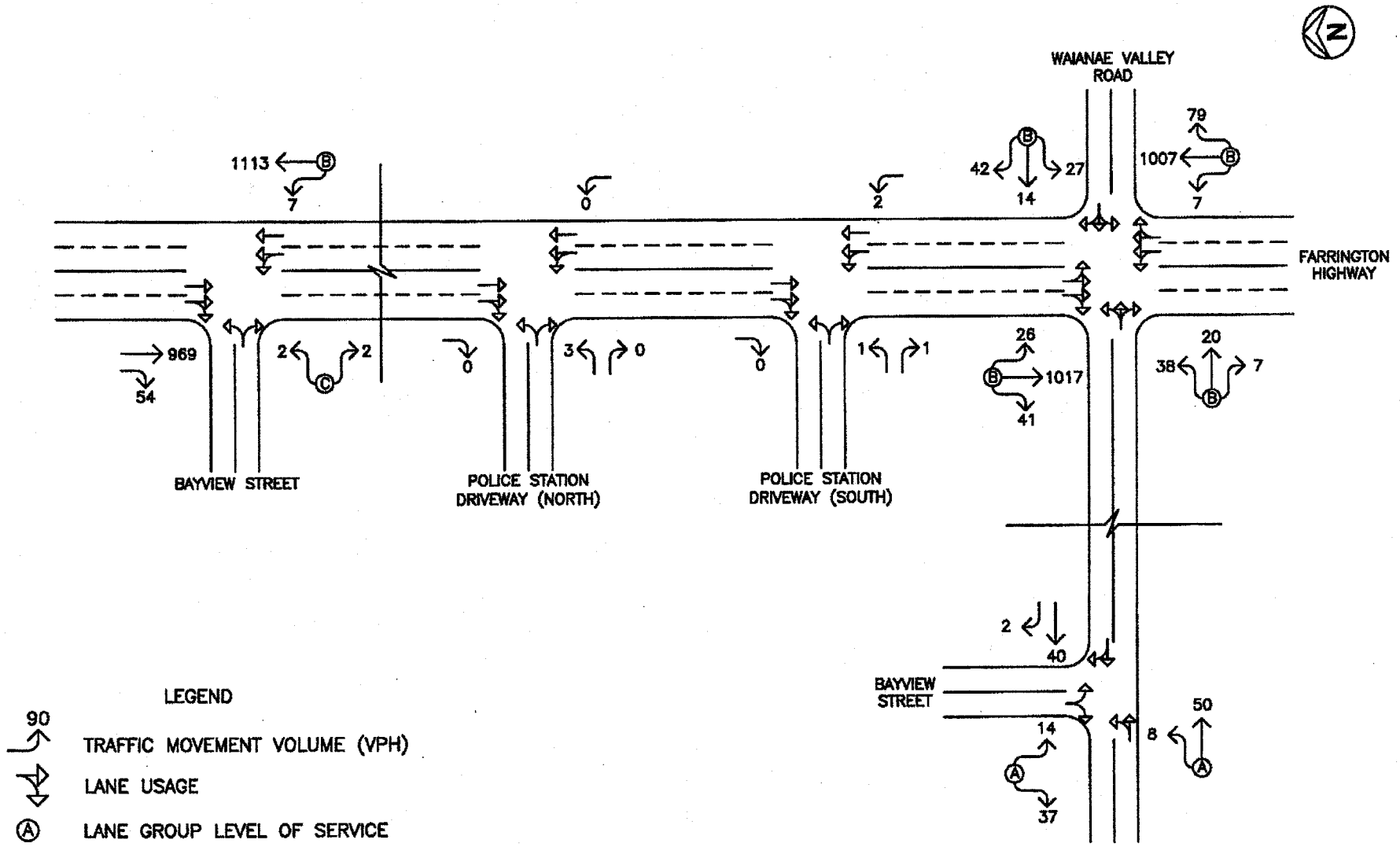
Typically, travel forecasts are developed based upon historical traffic count data obtained from the State Department of Transportation (SDOT), Highway Division survey stations. However, there was insufficient SDOT data in the project vicinity to derive an appropriate growth rate with a reasonable level of accuracy or certainty in the traffic forecast. As such, the travel forecast developed for this study conservatively assumes the existing traffic volumes along Farrington Highway will increase at a rate of 0.5% per year to the Year 2019. Using 2009 as the Base Year, a growth factor of 1.05 was applied to the existing through traffic demands along Farrington Highway to achieve the projected Year 2019 traffic demands.

C. Total Traffic Volumes Without Project

The projected Year 2019 AM and PM peak hour traffic volumes and operating conditions in the project vicinity without the redevelopment of the Waianae Police Station are shown on Figures 7 and 8, and summarized in Table 2. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

Table 2: Existing and Projected (Without Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement		AM		PM	
			Exist	Year 2019 w/out Proj	Exist	Year 2019 w/out Proj
Farrington Hwy/ Waianae Valley Rd	Eastbound	LT-TH-RT	B	B	B	B
	Westbound	LT-TH-RT	B	B	B	B
	Northbound	LT-TH-RT	B	B	B	B
	Southbound	LT-TH-RT	B	B	B	B

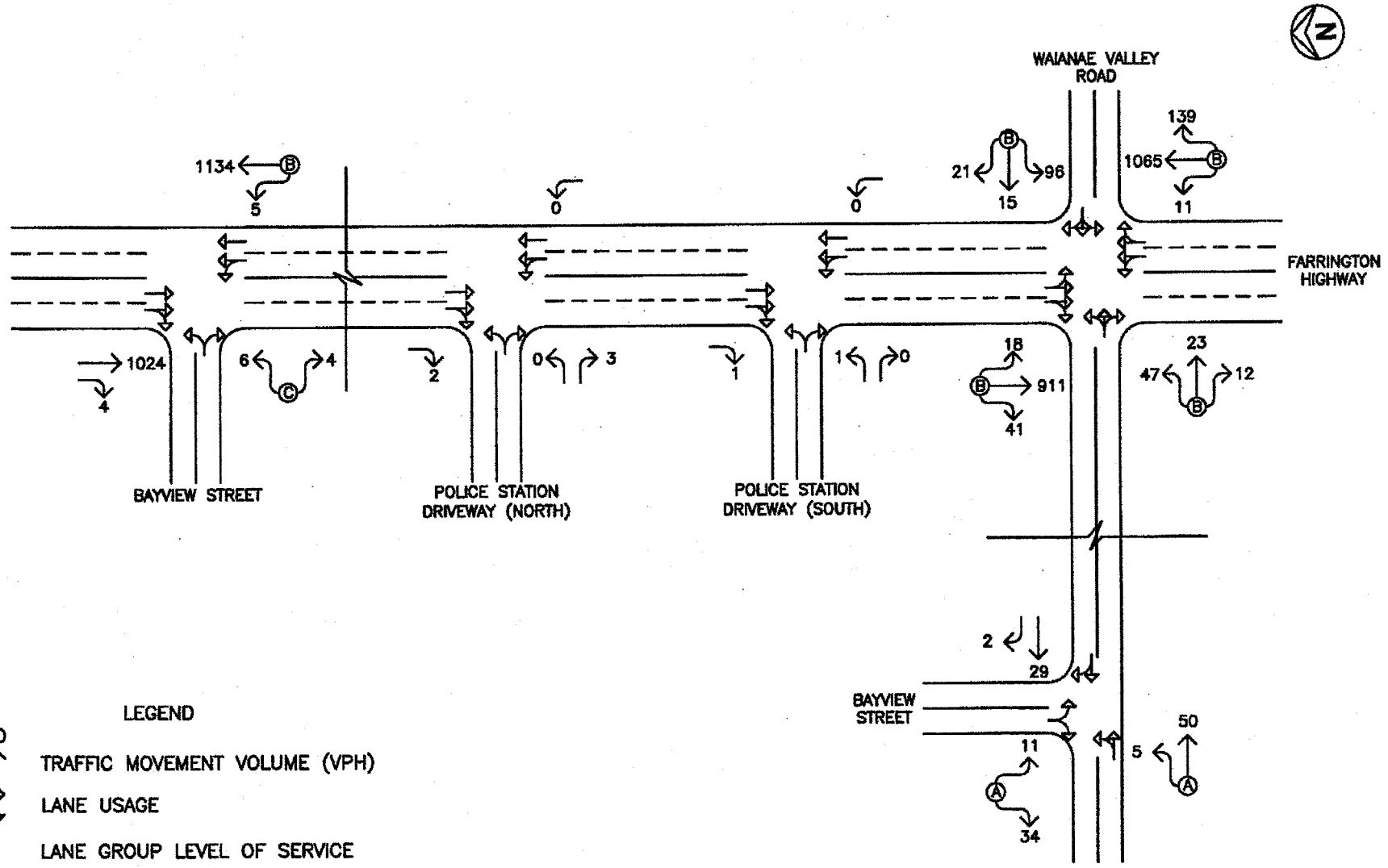


WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

WAIANAE POLICE STATION

YEAR 2019 AM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 7



WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

WAIANAE POLICE STATION

YEAR 2019 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 8

Table 2: Existing and Projected (Without Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Critical Traffic Movement		AM		PM	
			Exist	Year 2019 w/out Proj	Exist	Year 2019 w/out Proj
Farrington Hwy/ Bayview St	Eastbound	LT-RT	B	C	C	C
	Northbound	LT-TH	B	B	B	B
Waianae Valley Rd/Bayview St	Eastbound	LT-TH	A	A	A	A
	Southbound	LT-RT	A	A	A	A

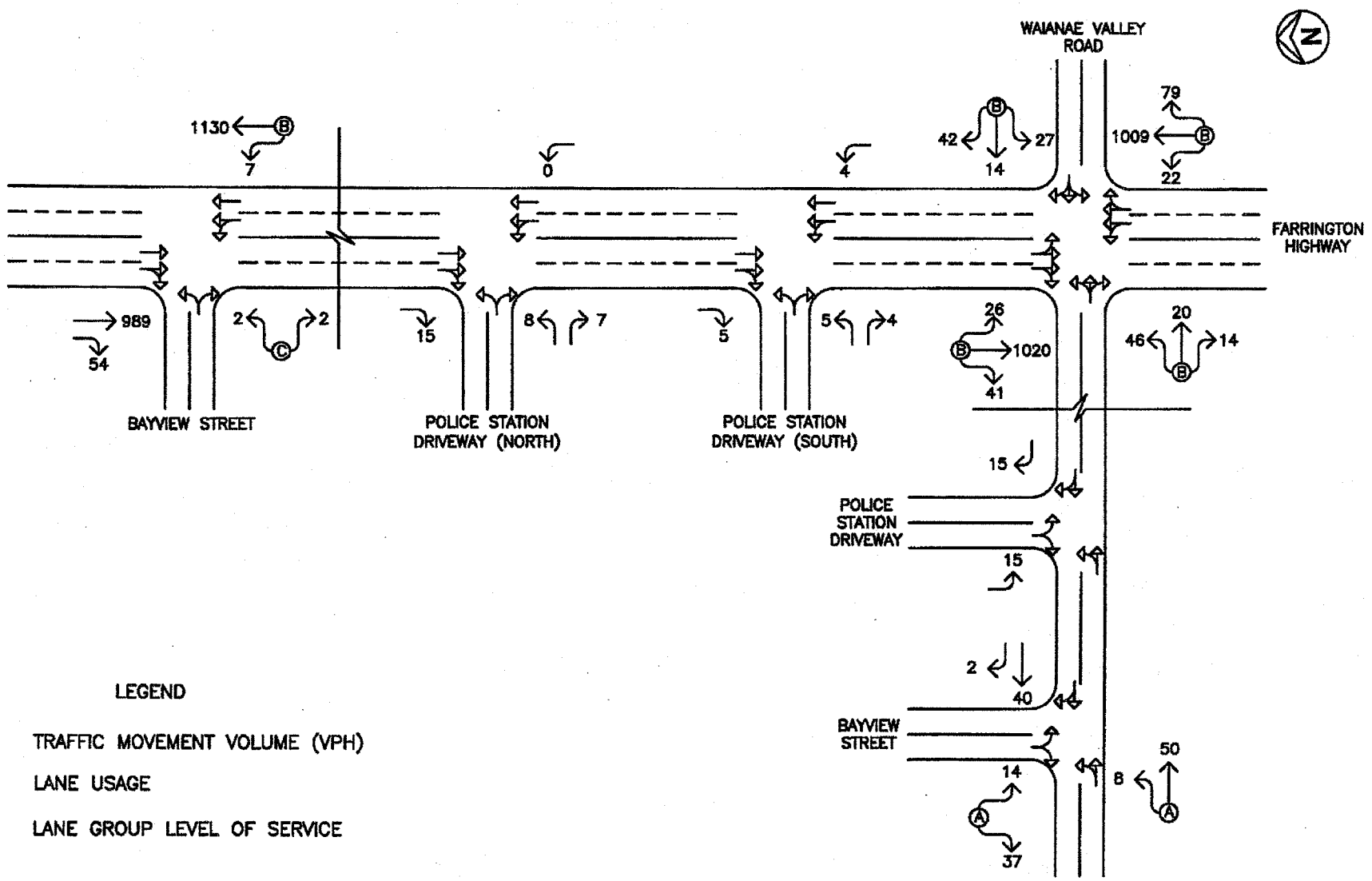
Traffic operations under Year 2019 without project conditions are expected, in general, to remain similar to existing conditions during both peak hours of traffic. At the intersection of Farrington Highway with Bayview Street, the eastbound approach of Bayview Street is expected to deteriorate from LOS "B" to LOS "C" during the AM peak period due to ambient growth in traffic along Farrington Highway. The other critical traffic movements at that intersection, as well as, the remaining study intersections are anticipated to continue operating at levels of services similar to existing conditions.

D. Total Traffic Volumes With Project

Figures 9 and 10 show the Year 2019 cumulative AM and PM peak hour traffic conditions resulting from the projected external traffic and the proposed redevelopment of the Waianae Police Station. The cumulative volumes consist of site-generated traffic superimposed over Year 2019 projected traffic demands. The traffic impacts resulting from the proposed project are addressed in the following section.

V. TRAFFIC IMPACT ANALYSIS

The Year 2019 cumulative AM and PM peak hour traffic conditions with the redevelopment of the Waianae Police Station are summarized in Table 3. The existing and projected Year 2019 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix E.

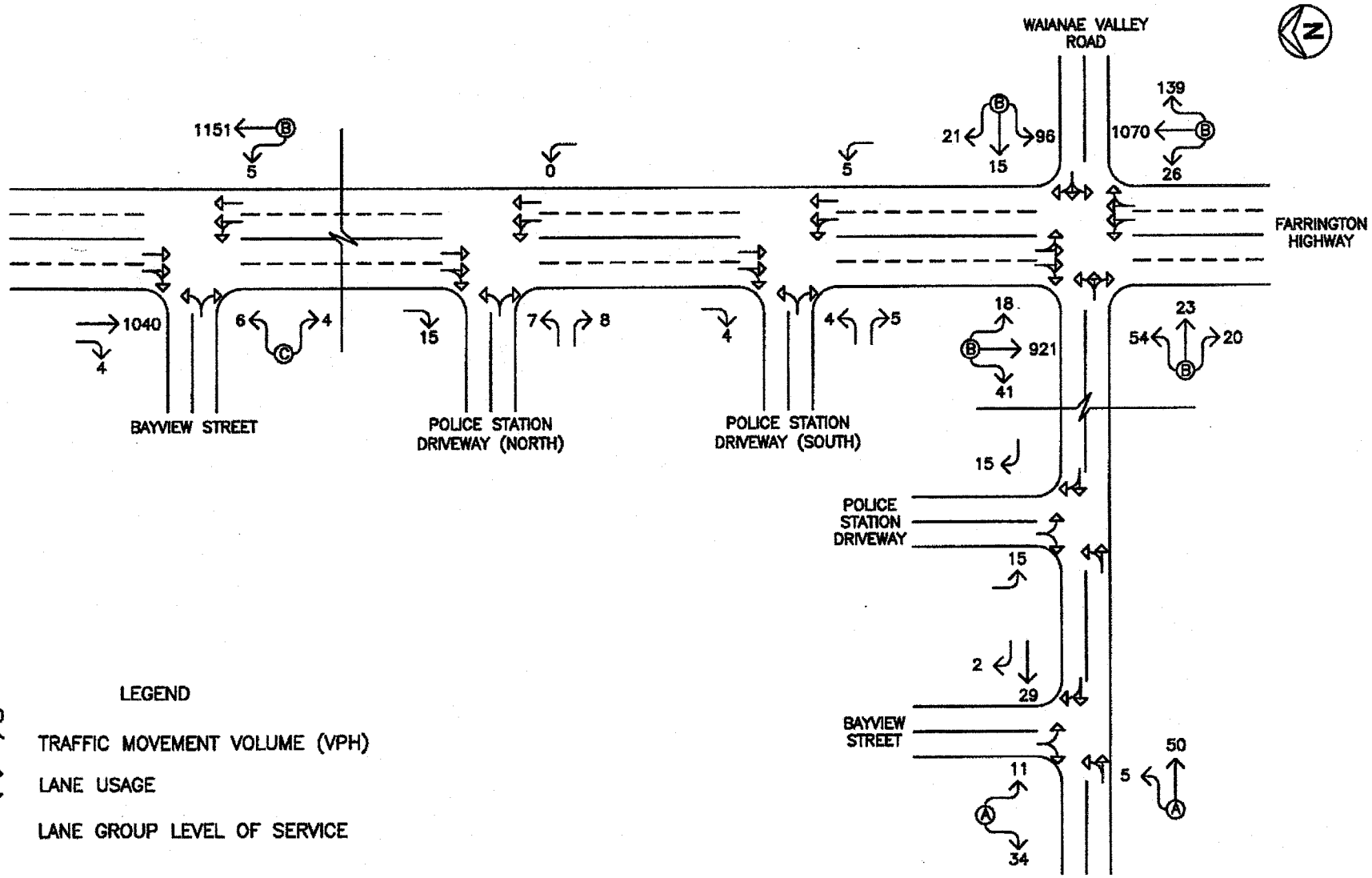


WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

WAIANAE POLICE STATION

YEAR 2019 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 9



WILSON OKAMOTO CORPORATION
ENGINEERS · PLANNERS

WAIANAE POLICE STATION

YEAR 2019 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 10

Table 3: Existing and Projected (Without and With Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement		AM			PM		
				Year 2019			Year 2019	
			Exist	w/out Proj	w/ Proj	Exist	w/out Proj	w/ Proj
Farrington Hwy/ Waianae Valley Rd	Eastbound	LT-TH-RT	B	B	B	B	B	B
	Westbound	LT-TH-RT	B	B	B	B	B	B
	Northbound	LT-TH-RT	B	B	B	B	B	B
	Southbound	LT-TH-RT	B	B	B	B	B	B
Farrington Hwy/ Bayview St	Eastbound	LT-RT	B	C	C	C	C	C
	Northbound	LT-TH	B	B	B	B	B	B
Waianae Valley Rd/ Bayview St	Eastbound	LT-TH	A	A	A	A	A	A
	Southbound	LT-RT	A	A	A	A	A	A

Traffic operations in the project vicinity are expected to remain similar to existing and Year 2019 without project conditions despite the addition of site-generated vehicles to the surrounding roadway network. At the intersections of Farrington Highway with Waianae Valley Road, the critical traffic movements are expected to continue operating at LOS "B" during both peak periods. At the intersection of Farrington Highway with Bayview Street, the critical traffic movements are expected to continue operating at LOS "C" or better during both peak periods. At the intersection of Waianae Valley Road with Bayview Street, the critical traffic movements are expected to continue operating at LOS "A" during both peak periods.

VI. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study:

1. Maintain sufficient sight distance for motorists to safely enter and exit all project driveways/roadways.

2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.

3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.

4. Provide sufficient turning radii at all project driveways/roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

VII. CONCLUSION

The proposed redevelopment of the Waianae Police Station is not expected to have a significant impact on the traffic operations in the project vicinity. The critical traffic movements at the intersections in the project vicinity are anticipated to continue operating at levels of service similar to existing and without project conditions. In addition, the total traffic volumes entering the intersections along Farrington Highway are expected to increase by less than 2% during both peak periods. These increases in the total traffic volumes are in the range of daily volume fluctuations along those roadways and represent a minimal increase in the overall traffic volumes.