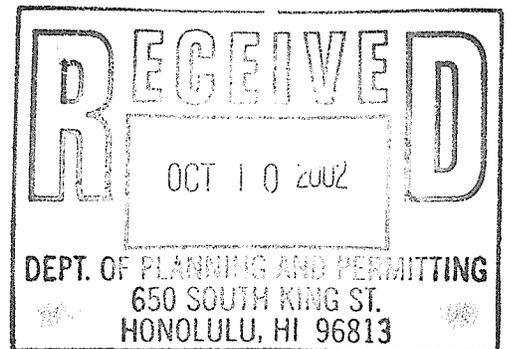


**FINAL
ENVIRONMENTAL ASSESSMENT**

**Waianae Coast
Emergency Access Road**

Waianae, Island of Oahu, Hawaii

**This document has been prepared pursuant to
Chapter 343, Hawaii Revised Statutes.**



**Prepared For:
The Department of Transportation Services
City and County of Honolulu**

**Prepared By:
Townscape, Inc.**

April 2002

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SECTION 1 INTRODUCTION AND SUMMARY

This Environmental Assessment (EA) has been prepared in accordance with the requirements of Chapter 343, "Hawaii Environmental Disclosure Law" of the Hawaii Revised Statutes and Chapter 11-200 "Environmental Impact Statement Rules" of the Hawaii Administrative Rules.

1.1 PROJECT INFORMATION SUMMARY

Proposing Agency: Department of Transportation Services
City and County of Honolulu
City Municipal Building
650 S. King Street, 2nd Floor
Contact: Mr. Mike Oshiro, Project Manager
Telephone: 808-523-4735 Fax: 808-523-4621

Project Name: Waianae Coast Emergency Access Road (WCEAR)

Location: Various developed and undeveloped land in the vicinity of Farrington Highway within the Nanakuli, Lualualei/Maili, Waianae and Makaha Valleys of the Waianae District. (Figure 1-1).

Tax Map Key (TMK): Portions of TMK Plats: 8-4-19:01, 20, 21, 22, 23, 24, 25, 26, 27; 8-4-20: 01, 02, 03; 8-5-2:16, 22, 23, 24, 25, 37, 38, 40; 8-5-3:30, 036; 8-5-6:10; 8-7-08:76, 77; 8-7-10:02, 20; 8-7-19: 01, 11, 46, 54; 8-7-21: 01, 35; 8-7-37:45; 8-9-01:02.

Environmental Assessment Prepared by: Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813
Contact: Ms. Sherri Hiraoka
Telephone: 808-536-6999 Fax: 808-524-4998

Accepting Authority: Department of Transportation Services
City and County of Honolulu
City Municipal Building
650 S. King Street
Contact: Ms. Cheryl Soon, Director
Telephone: 808-523-4125 Fax: 808-523-4730

Determination: A "Finding of No Significant Impact" (FONSI) has been given by the Department of Transportation Services.

1.2 OVERVIEW OF PROPOSED PROJECT

The City and County of Honolulu's Department of Transportation Services proposes to implement the Waianae Coast Emergency Access Road (WCEAR) in the Waianae District on the island of Oahu (Figure 1-1). The project includes the construction of six roadway segments consistent with Agricultural Road Standards within existing or new roadway lots. These new roadways (Figure 1-2) are typically referred to in this Environmental Assessment as "connector roadways."

These new connector roadways will link with existing streets to create a system of bypass routes that will allow traffic to move along the Waianae Coast when Farrington Highway is impacted by an "emergency situation." Such situations may include water main breaks, major traffic accidents or police-related activities such as hostage situations.

The WCEAR project proposes that one of the new connector roadways, the Paakea Road Extension, remain permanently open to traffic (Figure 1-2). The connector roadways proposed to only be open during emergency situations are the Nanakuli makai roadway connector, the Helelua Place extension and the Pakeke Street to Hakimo Road connector roadway. The status of the remaining two segments, the Mahinaau Road Extension and the Kaulawaha Road Improvement, has not yet been determined. Roadways that are determined to be permanently open to the public will have overhead street lighting in compliance with city lighting standards.

Construction of the proposed project could begin by the third quarter of calendar year 2002. The total estimated construction cost for the six new connector roadway improvements is \$7.9 million. The City and County of Honolulu will pay for all physical improvements and maintenance within the new roadway lots. The City intends to either acquire privately owned property or to create roadway easements, therefore allowing private owners to maintain ownership.

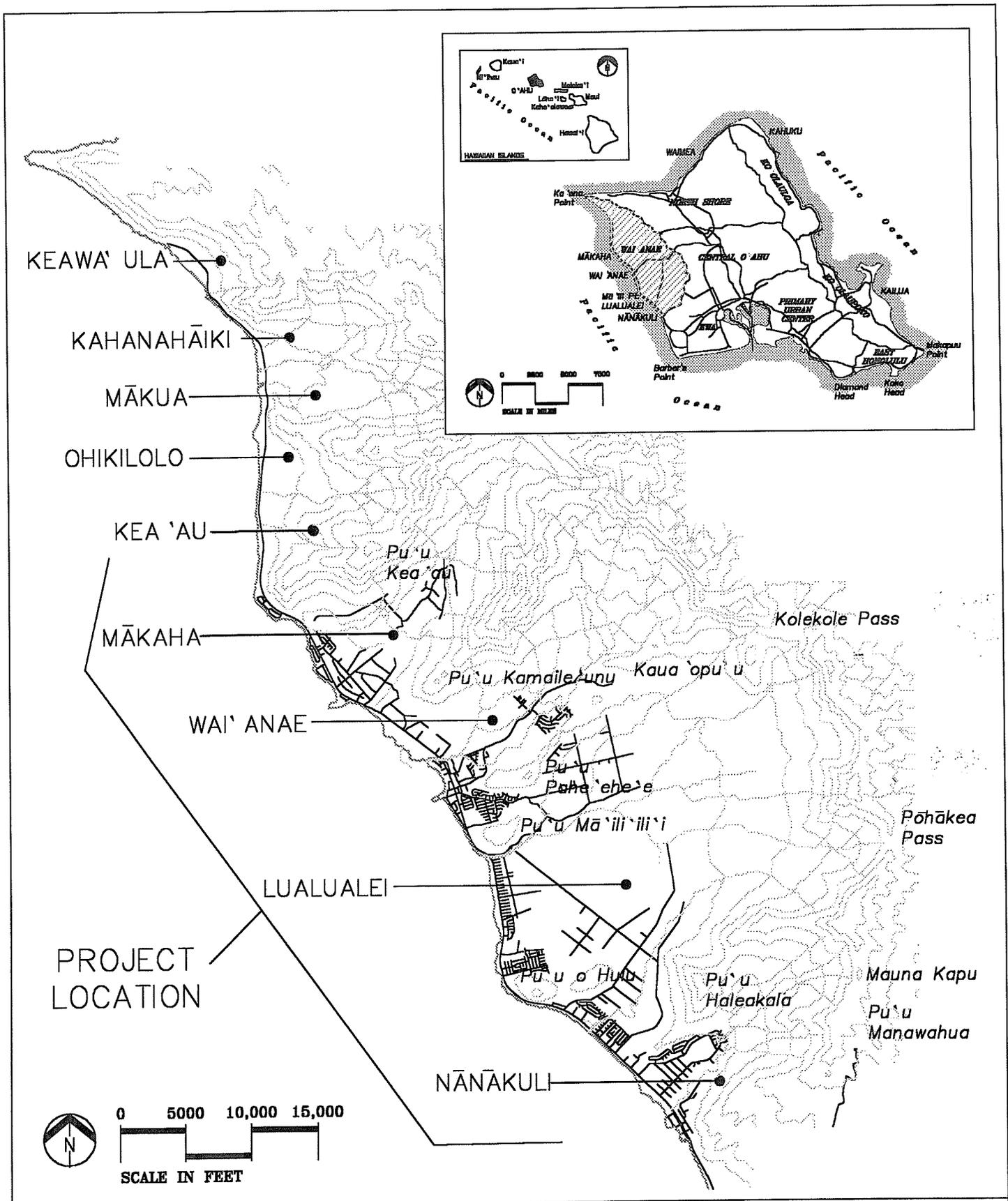
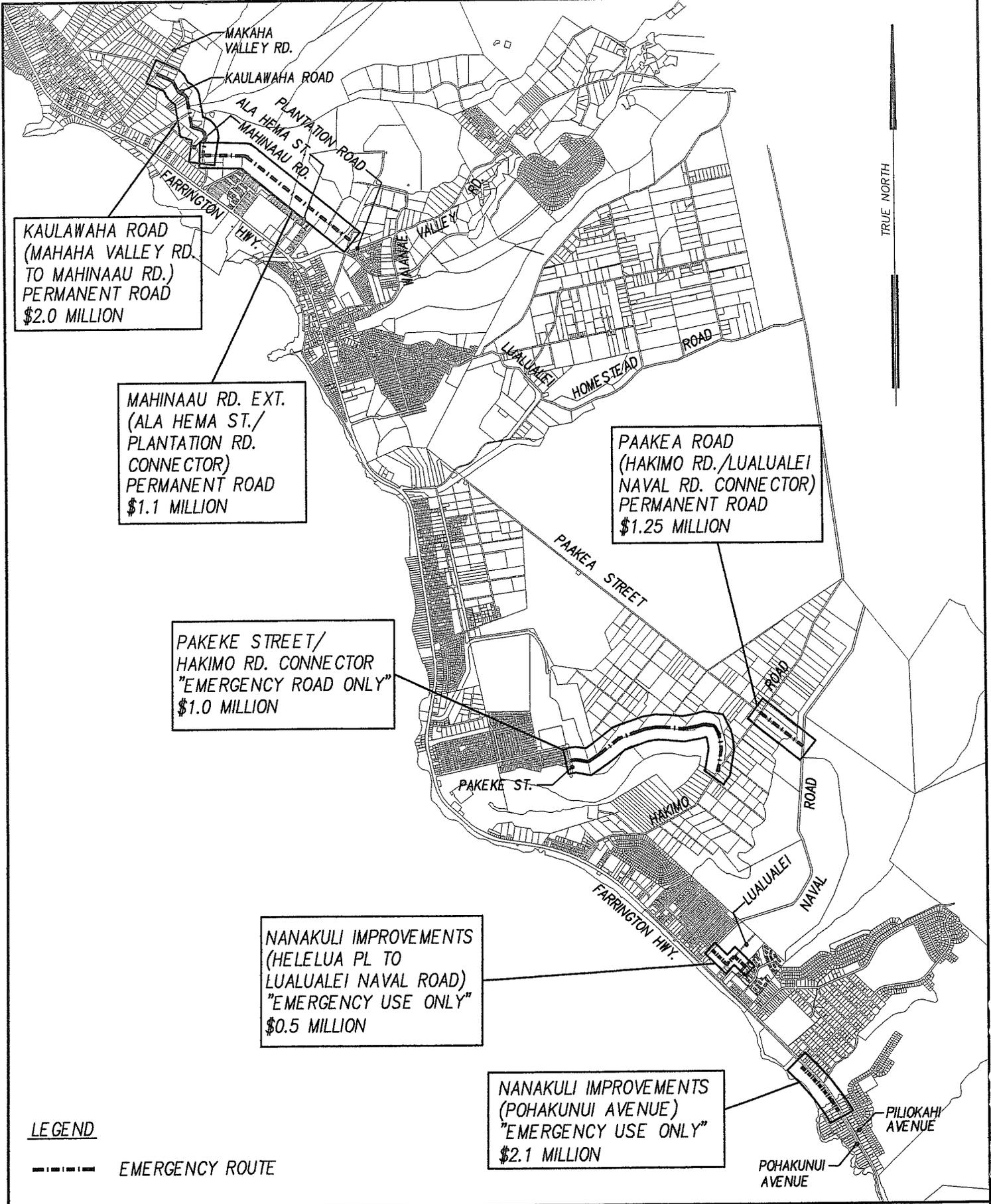


FIGURE 1 - 1
WAIANAЕ COAST EMERGENCY ACCESS ROAD
LOCATION MAP

December 2001

TOWNSCAPE, INC.
 Environmental and Community Planning
 900 Fort Street Mall
 Suite 1160
 Honolulu, HI 96813



KAULAWAHA ROAD
(MAHAHA VALLEY RD.
TO MAHINAUU RD.)
PERMANENT ROAD
\$2.0 MILLION

MAHINAUU RD. EXT.
(ALA HEMA ST./
PLANTATION RD.
CONNECTOR)
PERMANENT ROAD
\$1.1 MILLION

PAKEKE STREET/
HAKIMO RD. CONNECTOR
"EMERGENCY ROAD ONLY"
\$1.0 MILLION

PAAKEA ROAD
(HAKIMO RD./LUALUALEI
NAVAL RD. CONNECTOR)
PERMANENT ROAD
\$1.25 MILLION

NANAKULI IMPROVEMENTS
(HELELUA PL TO
LUALUALEI NAVAL ROAD)
"EMERGENCY USE ONLY"
\$0.5 MILLION

NANAKULI IMPROVEMENTS
(POHAKUNUI AVENUE)
"EMERGENCY USE ONLY"
\$2.1 MILLION

LEGEND

--- EMERGENCY ROUTE

SCALE:
1" = 4000'

CAD DRAWING:
DEA-KEYMAP

DATE:
MARCH 28, 2002

KEY MAP



Gray-Hong-Bills-Nojima & Associates, Inc
CONSULTING ENGINEERS

841 Bishop Street

Suite 1100

FIGURE

1-2

1.3 SUMMARY OF IMPACTS AND MITIGATION MEASURES

1.3.1 Environmental Impacts

The proposed project is not anticipated to have any significant long-term effects on the physical environment. No federally listed endangered or threatened plant or animal species were observed within the project corridor. Three streams will be crossed by the new roadways. All bridges will conform to FIRM flood elevations and City and County Drainage standards.

Short-term effects will include dust and noise impacts during construction. All construction activities will be restricted to the City's road right-of-way.

1.3.2 Social Impacts

The proposed project will provide alternate access along the Waianae coast. Direct and indirect jobs will be created during the construction phase of the project. The roadways will be designed to agricultural roadway standards and are therefore not expected to promote increased land development.

Three archaeological, historical or cultural sites may potentially be impacted by the proposed WCEAR project, including the OR&L Railroad right-of-way, three sinkholes located near the Helelua Place Extension right-of-way (ROW), and a human burial found in the Kaulawaha Road area. Construction will avoid the OR&L Railroad ROW. Sinkholes were found outside of the project boundaries in Nanakuli. If additional sinkholes are found within the ROW during construction, they will be investigated under the supervision of the Department of Land and Natural Resources State Historical Preservation Division, the Oahu Burial Council and members of the local community. The roadway alignment has been modified several times to avoid cultural impacts to burials, archaeological sites, and recreational venues.

There is some concern by the community over specific alignments, especially in the Kaulawaha area of Makaha, where residents are opposed to using the existing Mahinaau Road in the WCEAR project. Every effort will be made to accommodate the preferred alignment to reconstruct Kaulawaha Road but the option of using Mahinaau Road is also identified as a secondary alternative.

The City will need to acquire some private property to create roadway lots for this project. Compensation will be provided and discussions are ongoing with the private landholders.

1.3.3 Public Facilities and Services Impacts

All new roadways will be designed to accommodate public transportation (i.e. The Bus). Electricity will be required for permanently open roadways that will be equipped with overhead lighting. No other

communication systems will be required. Police protection is provided by District 8 – Waianae/Kapolei, with the District 8 Substation in Waianae providing the base of operations on the Waianae Coast. Fire protection is provided by both the Nanakuli Fire Station #28 and the Waianae Fire Station #26. Emergency Medical Services are provided by the Waianae Unit based at Waianae Fire Station #26. County Fire, Police, Emergency Services and Civil Defense departments have been consulted in the preparation of this plan in order to accommodate their specific needs.

1.4 RELATIONSHIPS TO PLANS, POLICIES AND CONTROLS

1.4.1 State Land Use

The proposed roadway alignments are designated Urban in the Nanakuli Sub-District, Agricultural and Urban in the Lualualei/Maili Sub-district, Urban in the Waianae Sub-District, and Urban and Conservation in the Makaha Sub-district. A Conservation District Use Permit will be obtained for the Kaulawaha section in the Makaha Sub-District. The Nanakuli makai roadway segment also falls within the Special Management Area Boundary. The appropriate approvals and permits will be obtained.

1.4.2 Waianae Sustainable Communities Plan

This proposed project is consistent with the Waianae Sustainable Communities Plan in that it establishes an Emergency Road “that can be used as an alternate to Farrington Highway for those times when one or more sections of Farrington Highway may be impassable due to storm damage, a severe vehicular accident, or some other cause.”

1.4.3 City and County of Honolulu Zoning

City and County Land Use Zoning designations include R-5 “Residential,” P-2 “General Preservation,” C “Country,” AG-1 “Restricted Agricultural,” I-2 “Intensive Industrial,” and AG-2 “General Agricultural.” The proposed roadway alignments will be designed to meet Agricultural Roadway Standards. Proposed permanent roadways fall within zoning designations where this standard is allowed. Additional improvements will not be necessary within the R-5 zoning because those roads within that designation are proposed for emergency access only.

1.5 APPLICABLE PERMITS AND APPROVALS

The necessary permits and approvals to construct the proposed improvements will be acquired from the appropriate Federal, State and County agencies. Permits anticipated include:

- U.S. Army Corps of Engineers Section 404 Permit
- U.S. Department of Health (DOH) National Pollution Discharge Elimination Permit
- State Department of Business, Economic Development and Tourism Coastal Zone Management Program Federal Consistency Determination
- State Department of Land and Natural Resources (DLNR) Conservation District Use Permit
- State DLNR Stream Channel Alteration Permit
- State DLNR State Historic Preservation Division Burial Treatment Plan Approval
- State Department of Transportation (DOT) New, Relocation and Modification Access Rights Into or Rights to Use State Highway Property
- State DOT Permit to perform Work Within a State Highway
- State DOH Section 401 Water Quality Certification
- State DOH Variance from Pollution Controls
- City Department of Planning and Permitting (DPP) Grubbing, Grading and Stockpiling Permit
- City DPP Public Infrastructure Map Revision
- City DPP Shoreline Setback Variance
- City DPP Sign Permit
- City DPP Special Management Area Permit
- City Department of Transportation Services Street Usage Permit for Construction

1.6 ALTERNATIVES CONSIDERED

The alternatives considered for proposed project included “No Action,” a Nanakuli Mauka Alternative, and a Nanakuli Makai Alternative. No Action would not fulfill the community need for an alternate emergency route into, out of and through the Waianae District. Existing mauka land uses and impacts to Nanaikapono Elementary School and Ulehawa Beach Park made the Nanakuli alternatives infeasible.

1.7 DETERMINATION AND FINDINGS

A “Finding of No Significant Impact” (FONSI) has been given by the City and County of Honolulu Department of Transportation Services.

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SECTION 2 PROJECT DESCRIPTION

2.1 PROJECT DESCRIPTION AND BACKGROUND

The City and County of Honolulu's Department of Transportation Services proposes to implement the Waianae Coast Emergency Access Road (WCEAR) project. This project includes the construction of six new roadway segments in the Nanakuli, Lualualei/Maili, Waianae and Makaha Valleys in the Waianae District of Oahu (Figure 1-1). New roads will be constructed within existing or new roadway lots and will be consistent with City Agricultural Road Standards. These new connector roadways will link with existing streets to create a system of bypass routes that will allow traffic to move along the Waianae Coast when Farrington Highway is impacted by an emergency situation including water main breaks, major traffic accidents or police-related activities such as hostage situations. The WCEAR route runs mauka of Farrington Highway, except for a portion in the Nanakuli sub-district where a new roadway corridor is proposed makai of the Oahu Railway and Land Company (OR&L) railroad tracks.

Farrington Highway is currently the only publicly accessible roadway into or out of the Waianae District and it is the only connector between the entire Leeward Coast and the urban center of Honolulu. Additionally, traffic can be completely locked in or out of the district when there is a major automobile accident, debris from storms on the roadway or other emergency situations. Waianae Coast residents described their need for an alternate access route to provide relief from those situations in the *Waianae Sustainable Communities Plan (June, 1999)*.

2.1.1 Community Meetings

Beginning in November of 2000, the City Department of Transportation Services sponsored a series of workshops for the Waianae District community. The purpose of the workshops was to discuss alternate routes to Farrington Highway utilizing existing streets and roadways, and the potential locations of new roadways connecting existing streets. Due to the geographical extent of the project area, workshop participants suggested meeting in smaller groups based on the sub-district boundaries of Makaha, Waianae, Lualualei/ Maili, and Nanakuli.

Each sub-district subsequently met to discuss alignment options within their area. By February 2001, each of the four groups had reached a consensus on the emergency road alignment within their particular sub-district. A General Community Meeting was held in March of 2001 when the preferred routes were presented and discussed. The next steps following that meeting consisted of preliminary engineering studies to define the physical construction requirements, development of construction cost estimates, and initiation of the environmental assessment process.

The community generally favored the use of existing streets and roads to minimize costs and impacts. However, use of private property will be required in some locations where new roadways need to be constructed to link existing streets. The WCEAR is designed to be a series of bypass routes, most of which run mauka (inland) of Farrington Highway. Traffic will only be routed around the portion of Farrington Highway impacted by an emergency situation and normal traffic patterns will resume on the Highway as soon as possible. The entire system of roadways is presented in more detail in Section 2.2.

2.1.2 Proposed New Roadway Corridors

The proposed alignment currently requires the construction of six new roadway connectors between:

<u>SUB-DISTRICT</u>	<u>"NEW CONNECTOR ROADWAY"</u>
Nanakuli	Makai of Farrington Highway from Laumania Avenue to Nanakuli Avenue (open during emergencies only)
Nanakuli	Mauka of Farrington Highway from Helelua Place to Lualualei Naval Road (open during emergencies only)
Lualualei/Maili	Paakea Road Extension from Lualualei Naval Road to Hakimo Road (permanently open)
Lualualei/Maili	Hakimo Road to Pakeke Street (open during emergencies only)
Waianae and Makaha	Mahinaau Road Extension to Ala Hema Street and Plantation Road (status pending)
Makaha	Kaulawaha Road Extension to Mahinaau Road (status pending)

Permanent use was considered for every new roadway in the proposed WCEAR project. However, the planning process revealed community opposition to permanent status for particular road segments due to concerns over child safety, continuation of neighborhood quality of life, access to archaeologically sensitive sites and dumping. The City determined that these community concerns outweighed the arguments for permanent status for all roadways. The connector roadways that remain permanently open will have overhead street lighting in compliance with City lighting standards. Currently, only the Paakea Road extension is scheduled for permanent public access. The Nanakuli Makai connector roadway, the Helelua Place extension to Lualualei Naval Road and the Hakimo Road to Pakeke Street connector roadway would only be open to public use during emergency situations. The status of the Mahinaau Road Extension and the Kaulawaha Road Improvements will be determined in the final design stage.

The initial community meeting phase provided direction for new roadway section design criteria. It was generally agreed upon that all new roadways should accommodate two-way traffic and public transportation. Therefore, all proposed connector roadways will meet criteria that are suitable to accommodate public transportation (i.e., The Bus System) and comply with City and County Agricultural Road Standards. The City's Agricultural Roadway standards were adopted to determine roadway specifications for construction because they are appropriate for the City zoning districts (Country,

Agriculture and Preservation Zoning Districts) where all permanently open roadway improvements may potentially be located. Those new roads located in other zoning designations are proposed for “Emergency Use Only” and will not allow regular public access.

Figure 2-1 depicts the typical agricultural roadway section proposed for the WCEAR. Elements of the typical roadway section include a 40-foot to 50-foot right-of-way (ROW), two 12-foot wide travel lanes and 8-foot to 13-foot wide grassed shoulder areas. Pavement and shoulder widths vary depending on available ROW. The existing land will be graded as needed. The road itself will consist of an 18-inch compacted sub-grade, an 8-inch base course and 2.5 inches of asphaltic concrete. Overhead street lighting will be installed for those road sections that will remain permanently open.

2.2 PHYSICAL IMPROVEMENTS PLAN FOR NEW ROADWAY CORRIDORS

The new roadway segments will allow for bypass options around traffic disruptions on Farrington Highway. This section defines the physical improvements necessary to allow implementation of the various proposed routing options described in Section 2.3.

2.2.1 Concept Introduction

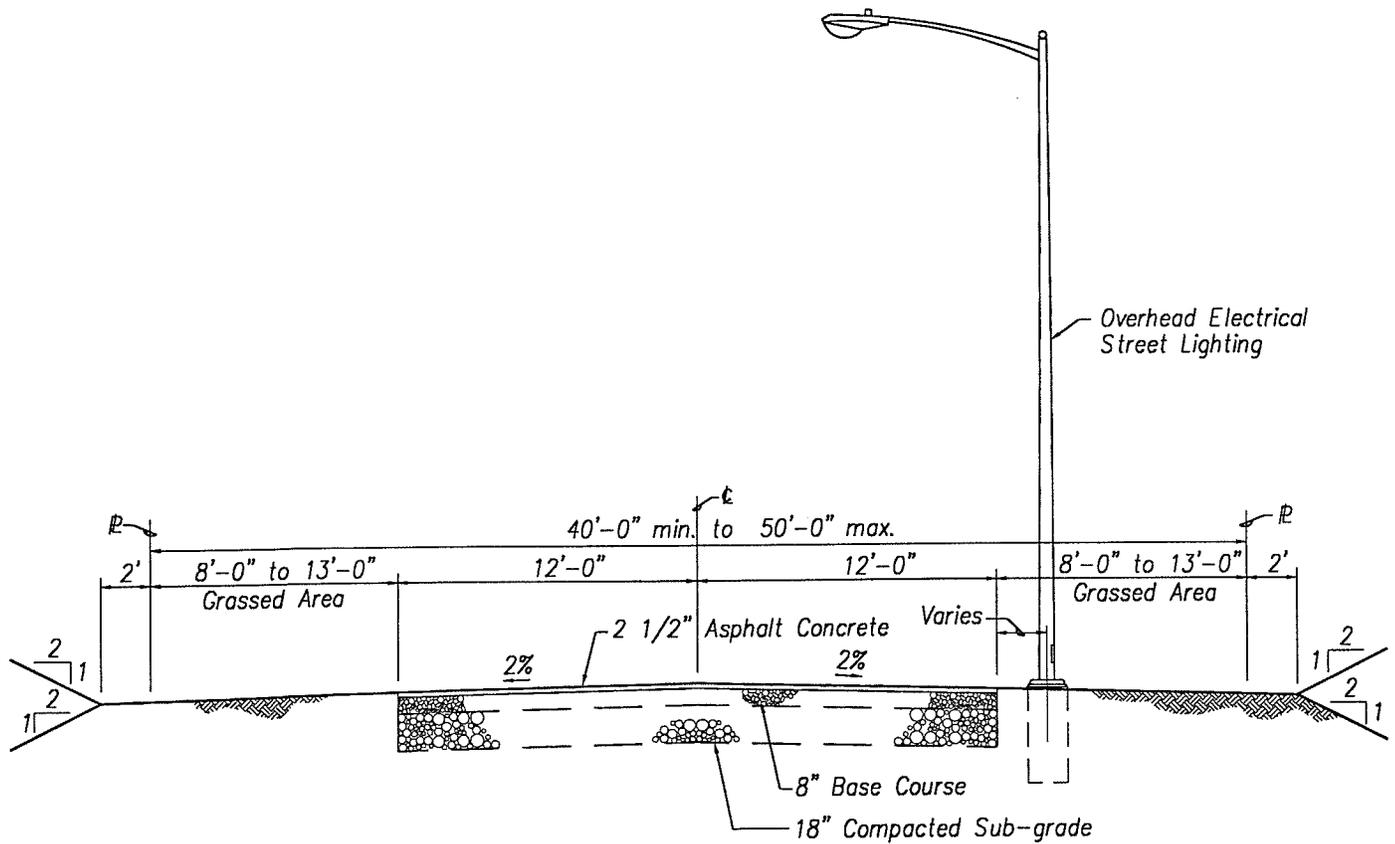
The proposed roadways are designed to facilitate traffic movement around “Emergency Situations” adversely affecting traffic flow on Farrington Highway. “Emergency Situations” may include any event inhibiting traffic movement such as water main breaks, major traffic accidents, police related activities (including hostage situations) or significant sand deposits from coastal storms.

Proposed roadway connectors will meet criteria that would accommodate public transportation (i.e. The Bus System) and comply with City and County Standards. To that end, the City’s Agricultural Roadway section has been adopted as the standard for construction. All roadway improvements potentially proposed for permanent public access are located in City and County Zoning Districts defined as Country Zoning, Agricultural Zoning or Preservation Zoning. Therefore, the use of the City’s Agricultural Roadway Standard is consistent with zoning designations. The Agricultural Roadway Section is also proposed for roadway improvements that are designated for “emergency use” only, regardless of zoning district designation. This is appropriate because “emergency use” roads will not be regularly accessible to the public and will therefore not require additional improvements. The typical agricultural roadway section is shown on Figure 2-1.

There are six roadway segments proposed for physical improvements. Figure 1-2 shows an overall key plan for the specific roadway improvements and Table 2-1 shows a summary of the proposed physical improvements. Appendix A contains a set of preliminary engineering plans for all roadway improvements. Section 2.4 provides preliminary cost estimates for each of the proposed improvements. The following narrative provides a description of the major elements of each section of new roadway.

**TABLE 2 - 1
WCEAR PHYSICAL IMPROVEMENT SUMMARY**

WCEAR ROADWAY SEGMENT	EXISTING OWNERSHIP/ MAINTENANCE	PROPOSED OWNERSHIP/ MAINTENANCE	PROPOSED RIGHT-OF-WAY (ROW)	SUBDIVISION REQUIREMENTS	USE STATUS	ESTIMATED CONSTRUCTION COST (\$)	FEATURES
NANAKULI MAKAI ROAD IMPROVEMENTS	STATE/ (NO EXISTING ROAD)	STATE/ CITY & COUNTY	44-FOOT ROW (24-FOOT PAVEMENT) (10-FOOT SHOULDERS)	YES	EMERGENCY USE ONLY	2,100,000	BRIDGE STRUCTURE AT NANAKULI STREAM SPECIAL MANAGEMENT AREA PERMIT
HELELUA PLAGE EXTENSION TO LUALUALEI NAVAL ROAD	PRIVATE/ (NO EXISTING ROAD)	CITY & COUNTY/ CITY & COUNTY	44-FOOT ROW (24-FOOT PAVEMENT) (10-FOOT SHOULDERS)	YES	EMERGENCY USE ONLY	500,000	
PAAKEA ROAD IMPROVEMENTS (HAKIMO ROAD/ LUALUALEI NAVAL ROAD CONNECTOR)	PRIVATE/ PRIVATE	CITY & COUNTY/ CITY & COUNTY	40-FOOT ROW (24-FOOT PAVEMENT) (8-FOOT SHOULDERS)	NO	PERMANENTLY OPEN	1,250,000	BRIDGE STRUCTURE AT ULEHAWA STREAM
PAKEKE STREET/ HAKIMO ROAD CONNECTOR	PRIVATE/ PRIVATE	CITY & COUNTY/ CITY & COUNTY	44-FOOT ROW (24-FOOT PAVEMENT) (10-FOOT SHOULDERS)	YES	EMERGENCY USE ONLY	1,000,000	
MAHINAAU ROAD EXTENSION (TO ALA HEMA STREET/ PLANTATION ROAD)	PRIVATE/ (NO EXISTING ROAD)	CITY & COUNTY/ CITY & COUNTY	44-FOOT ROW (24-FOOT PAVEMENT) (10-FOOT SHOULDERS)	YES	UNDETERMINED	1,100,000	USE STATUS NEEDS FINAL DETERMINATION BASED ON COMMUNITY INPUT
KAULAWAHA ROAD IMPROVEMENTS (MAKAHA VALLEY ROAD TO MAHINAAU ROAD)	PRIVATE/ PRIVATE	CITY & COUNTY/ CITY & COUNTY	50-FOOT ROW & 44-FOOT ROW (24-FOOT PAVEMENT) (10-FOOT & 13-FOOT SHOULDERS)	YES	UNDETERMINED	2,000,000	BRIDGE STRUCTURE AT EAST MAKAHA STREAM, CONSERVATION DISTRICT USE PERMIT, USE STATUS NEEDS FINAL DETERMINATION BASED ON COMMUNITY INPUT



SCALE:
NOT TO SCALE

CAD DRAWING:
DEA-2810TYP

DATE:
MARCH 28, 2002

TYPICAL AGRICULTURAL
ROADWAY SECTION PROPOSED
FOR THE WAIANAE COAST
EMERGENCY ACCESS ROAD PLAN



Gray-Hong-Bills-Nojima & Associates, Inc
CONSULTING ENGINEERS

841 Bishop Street

Suite 1100

FIGURE

2-1

2.2.2 Nanakuli Makai Roadway Improvements (Sheets 1 to 3 of 26 Appendix A) (Pohakunui Avenue from Laumania Avenue to Nanakuli Avenue, Nanakuli Sub-District)

The first Community Participation Phase of the WCEAR Project suggested that the Nanakuli Makai Roadway improvements include Pohakunui Avenue from Piliokahe Beach Park to Laumania Street (See Figure 2-2 for location). However, the Department of Hawaiian Home Lands (DHHL) has proposed and substantially completed the design of roadway improvements for this section. These plans are entitled "Nanaikapono Subdivision Upgrades." These improvements will provide a 40-foot right-of-way (ROW) with a curb-to-curb pavement width of 28 feet and 6-foot wide shoulders including a 2-foot wide planting strip and a 4-foot wide sidewalk. Sheet 2 of 26 in Appendix A shows the location of the DHHL improvements. Since the DHHL roadway improvements are consistent with the WCEAR Plan, the WCEAR only identifies roadway improvements makai of Farrington Highway from Laumania Avenue to Nanakuli Avenue. However, Pohakunui Avenue is included in the WCEAR Operation Plan, which discusses traffic re-routing around Farrington Highway.

The initial WCEAR Community Participation Process designated the Nanakuli makai segment as a roadway that should only be opened in the event of an "Emergency Situation." Therefore, gates or chains with posts located at Laumania Avenue and Nanakuli Avenue will prohibit motor vehicle access during non-emergency conditions.

Sheets 1 through 3 of Appendix A provide the preliminary engineering designs (plan and profile as well as a map identifying the affected properties) for this segment. Significant features of the proposed Nanakuli Makai segment of the WCEAR are:

1. A 40-foot ROW will be created directly adjacent to the makai side of the Oahu Railway and Land Company (OR&L) Railroad ROW to accommodate the WCEAR. The 40-foot ROW would allow construction of a 24-foot wide roadway pavement and 8-foot wide grassed shoulder sections. The only affected property is Nanakuli Beach Park, which is owned by the State of Hawaii and maintained by the City and County of Honolulu (See Property Map-Sheet 3 of 26 - Appendix A).

The City and County proposes to acquire and maintain an easement for the road ROW from the State.

2. The pedestrian bridge at Nanakuli Stream will be reconstructed into a traffic-bearing bridge. The current bridge deck will be elevated 5-6 feet to meet Flood Insurance Rate Map (FIRM) requirements and City and County Drainage Standard requirements.
3. The intersection of the new roadway with Farrington Highway at Nanakuli Avenue will be modified. Improvements include widening the pavement to 24 feet, adjusting the traffic signal standards and possibly impacting a Hawaiian Electric Company vault.

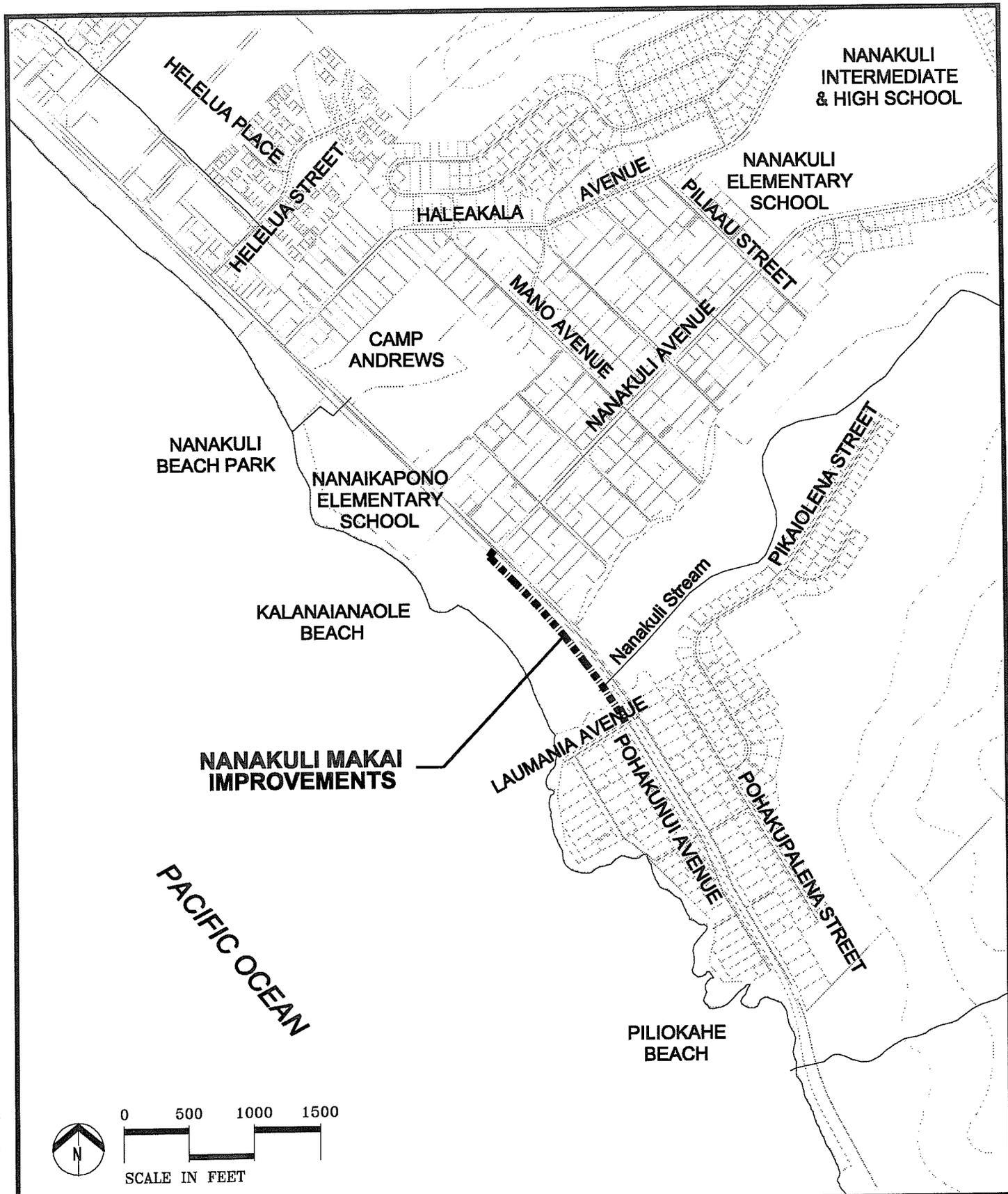


FIGURE 2 - 2
WAIANAEO COAST EMERGENCY ACCESS ROAD
NANAKULI MAKAI IMPROVEMENTS
 Laumania Avenue to Nanakuli Avenue
 "Emergency Use Only"

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4. A 40-foot wide section of the OR&L Railroad ROW will be reconstructed at the Nanakuli Makai Roadway - Farrington Highway intersection at Nanakuli Avenue. Reconstruction may include resetting the rails to match the adjusted grade.
5. This section of roadway would be used only during Emergency Situations under the direction of the Honolulu Police Department (Waianae and Kapolei Districts). The roadway would be gated during non-emergency periods.
6. A Special Management Area Permit, a Department of the Army Permit and a Stream Channel Alteration Permit are anticipated.

The estimated total cost for the Nanakuli Makai Roadway component of the WCEAR (between Laumania Avenue and Nanakuli Avenue) is \$2.12 million.

2.2.3 Helelua Place Extension (Sheets 4 and 5 of 26 - Appendix A) (Helelua Place to Lualualei Naval Road, Nanakuli Sub-District)

Comments from the WCEAR Community Participation Process originally recommended continuing the Nanakuli Makai WCEAR segment from Pohakunui Avenue to Lualualei Naval Road. However, preliminary engineering studies identified unacceptable impacts to Nanaikapono School and Ulehawa Beach Park. Therefore, the makai roadway was terminated at Nanakuli Avenue. The alternate mauka route extends from Helelua Place to Lualualei Naval Road (Figure 2-3). However, there is a 770-foot section of Farrington Highway between Haleakala Avenue and Helelua Street where no bypass route is available. Efforts to find an agreeable bypass for this section were unsuccessful.

Sheets 4 and 5 of Appendix A provide the preliminary engineering designs (plan and profile as well as a map identifying the affected properties) for this segment. Significant features of the proposed Helelua Place Extension of the Nanakuli Sub-District are:

1. A 44-foot ROW will be created with a 24-foot wide roadway pavement and 10-foot wide grassed shoulders on either side. The affected property owners are:

Puu Haleakala Community Association	8-7-37: 45
Leeward Hawaii, Inc.	8-7-08: 76
Central Pacific Development Corporation	8-7-08: 77

Land owners are identified on the Property Map in Appendix A for this segment (Sheet 5 of 26).

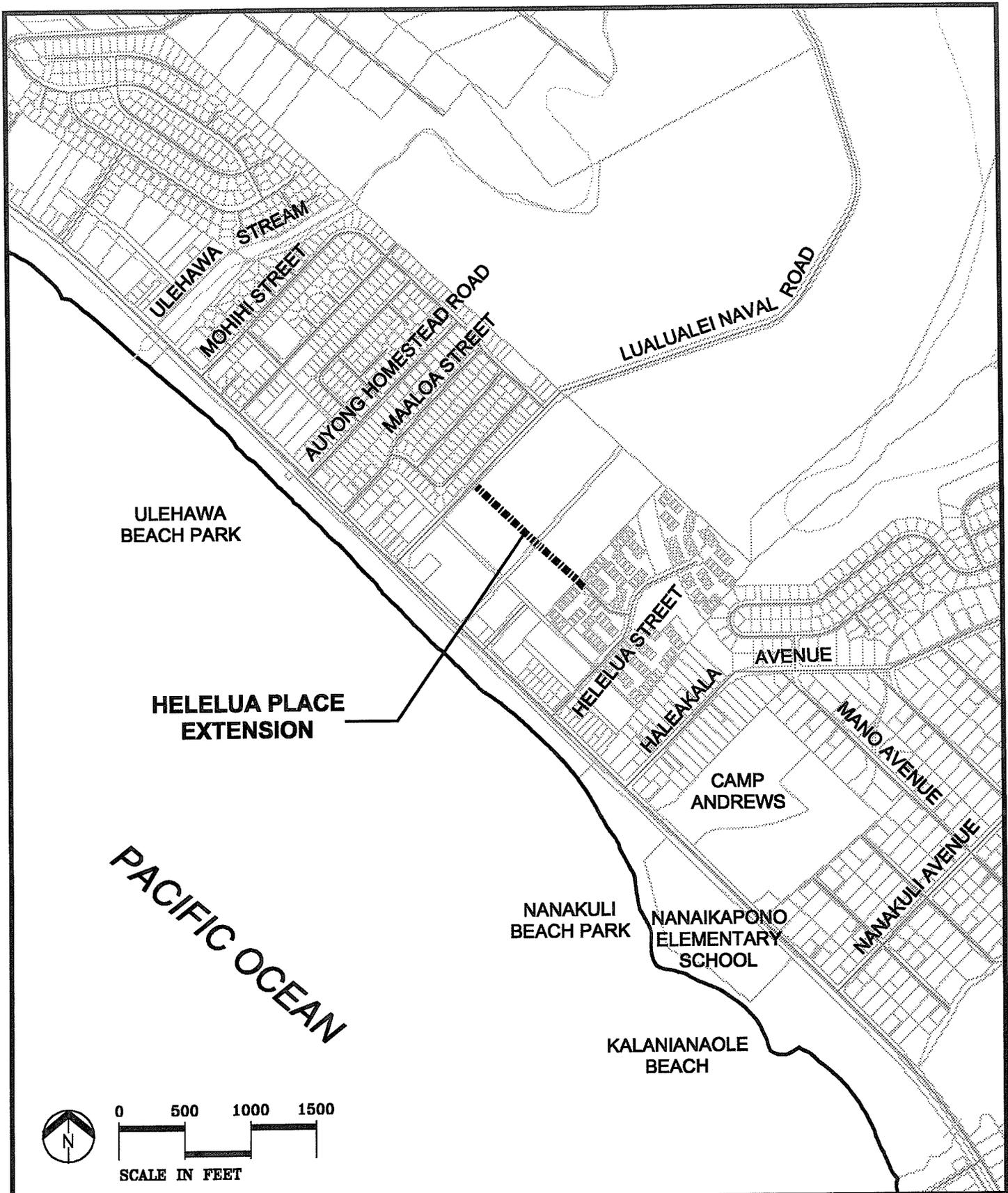


FIGURE 2 - 3
WAIANAE COAST EMERGENCY ACCESS ROAD
HELELUA PLACE EXTENSION
 Helelua Place to Lualualei Naval Road
 "Emergency Use Only"

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2. The roadway will be created through subdivision of the subject properties. The City proposes to acquire and maintain the resulting ROW.
3. This section of roadway would be used only during Emergency Situations under the direction of the Honolulu Police Department (Waianae and Kapolei Districts). The roadway would be gated during non-emergency periods.

The estimated total cost for the Helelua Place extension of the WCEAR is \$0.44 million.

2.2.4 Paakea Road Improvements (Sheets 6 through 8 of 26 - Appendix A) (Connecting Paakea Road to Lualualei Naval Road, Lualualei/Maili Sub-District)

Sheets 6 through 8 in Appendix A provide the preliminary engineering designs (plan and profile as well as a map identifying affected properties) for this segment. Significant features of the Paakea Road Improvements (Figure 2-4) of the Lualualei/Maili Sub-District WCEAR include:

1. A 24-foot wide roadway section will be reconstructed within an existing 40-foot wide roadway lot, with 8-foot wide grassed shoulders. A cut or fill bank will be extended from the grassed shoulders into the adjacent lots. Affected property owners are:

Mimoro/Merlin Saki	8-7-19: 01
Kaiser Cement and Gypsum Corp.	8-7-19: 46 8-7-21: 35
Yoshio/Grace Honda Harry/Irene Okabe	8-7-19: 54
Morito/Kimie Sawa	8-7-21: 01

The property owners are identified on the Property Map in Appendix A for this segment of roadway (See Sheet 8 of 26).

The City intends to acquire the existing roadway lots and to maintain the new roadway.

2. The Ulehawa Stream bridge will be reconstructed to accommodate a 100-year flow (as designated by FIRM) as well as City and County of Honolulu Drainage Standards. The additional height required is approximately 4 feet. The bridge will span the channel banks. Therefore, no Stream Channel Alteration Permit or Department of the Army Permit is anticipated. However, this will be verified prior to commencing with final design.

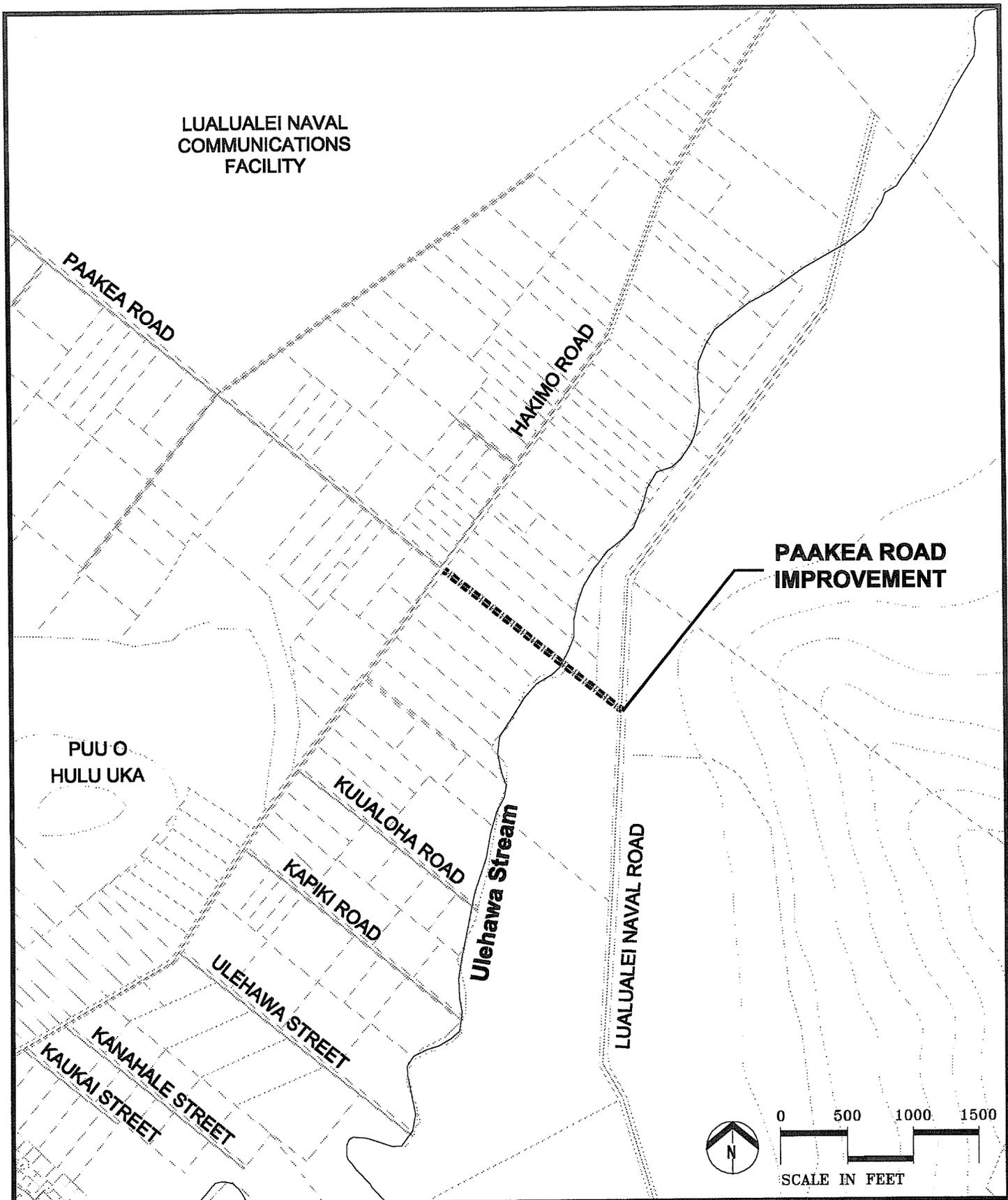


FIGURE 2 - 4
WAIANAË COAST EMERGENCY ACCESS ROAD
PAAKEA ROAD IMPROVEMENT
 Luualulei Naval Road to Hakimo Road
 "Permanent Road"

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- 3. Based on input from the community, this section of roadway is proposed for permanent status. The primary benefit of this segment is as a connector that allows bypass of Farrington Highway from the Nanakuli Sub-District to the Waianae Sub-District. Additionally, the community recognized the benefit of this segment to traffic movement in non-emergency situations.

The estimated total cost for the Paakea Road Improvement component of the WCEAR is \$1.24 million.

**2.2.5 Pakeke Street/Hakimo Road Connector (Sheets 9 through 15 of 26 - Appendix A)
(Maili/Lualualei Sub-District)**

The Maili Kai residential development adjacent to Kaukama Road resulted in a unilateral agreement as a condition of rezoning. One condition of the agreement allows emergency travel via an 18-foot wide coral access roadway from Pakeke Street to Hakimo Road. The WCEAR plan proposes to upgrade the coral roadway to asphaltic concrete that would accommodate public transportation.

Sheets 9 through 15 of 26 in Appendix A provide the preliminary engineering design (plan and profile as well as a map identifying affected properties) for this segment. Significant features of the proposed Pakeke Street/Hakimo Road connector (Figure 2-5) include:

- 1. The existing crushed coral “Emergency Roadway” will be reconstructed into a 24-foot wide all-weather asphaltic concrete pavement roadway. The right-of-way will be 44 feet wide and will include 24 feet of asphaltic concrete pavement and 10-foot wide grassed shoulders. The existing right-of-way will require expansion from 44 feet to 66 feet. Twenty-two feet of the right-of-way will remain in its existing condition for drainage purposes. The affected property owners are:

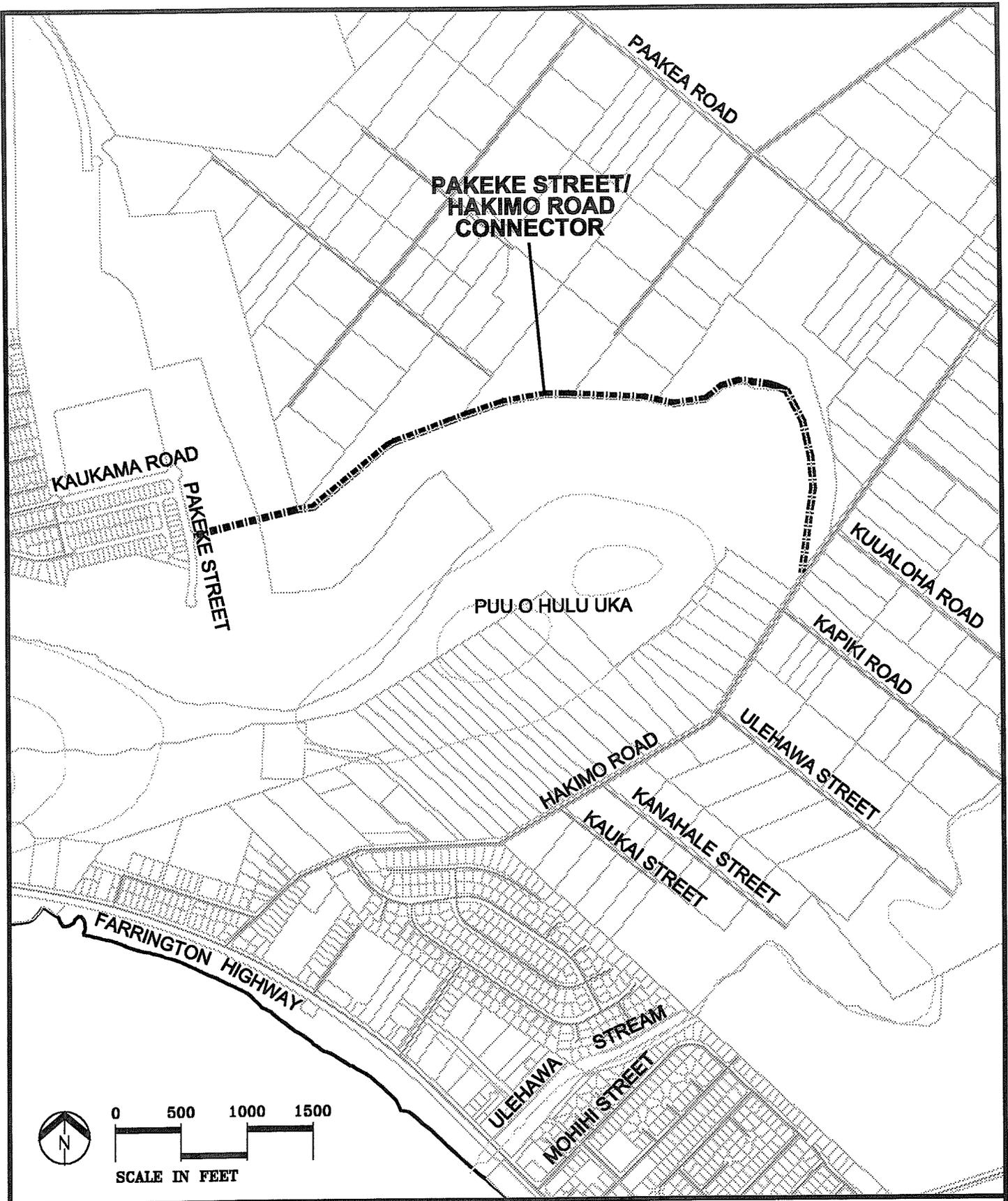
PH Property Development Corp. 8-7-10: 02
Schuler Homes Inc.

PH Property Development Corp. 8-7-10: 20

Agnes/George Fujii 8-7-19: 11

The property owners are identified on the Property Map in Appendix A for this segment of Roadway (Sheets 14 and 15 of 26).

The City intends to acquire the expanded roadway easement and to maintain the ROW.



**PAKEKE STREET/
HAKIMO ROAD
CONNECTOR**

FIGURE 2 - 5
WAIANAE COAST EMERGENCY ACCESS ROAD
PAKEKE STREET/HAKIMO ROAD CONNECTOR

"Emergency Use Only"

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2. This section of roadway would be used only during Emergency Situations under the direction of the Honolulu Police Department (Waianae and Kapolei Districts). The roadway would be gated during non-emergency periods.

The estimated total cost for this Pakeke Street to Hakimo Road Connector is \$1.02 million.

2.2.6 Mahinaau Road Extension to Ala Hema Street/Plantation Road (Sheets 16 through 21 of 26 – Appendix A) (Makaha and Waianae Sub-Districts of the WCEAR)

This is one of the primary segments of the WCEAR. Combined with the Kaulawaha Road Improvements described below, this roadway allows for the connection of Lualualei Naval Road with Makaha Valley Road without entering Farrington Highway (Figure 2-6). Sheets 16 through 21 in Appendix A provide the preliminary engineering designs (plan and profile as well as a map identifying affected properties) for this segment. Significant features of the Mahinaau Road Extension include:

1. The proposed right-of-way will be 44 feet wide and will consist of 24-feet of asphaltic concrete pavement with 10-foot wide grassed shoulders on either side. Affected property owners are:

Wu-Waianae Inc.	8-5-2: 22 8-5-3: 30
State of Hawaii, Department of Education Kamaile Elementary School (Expansion Site)	8-5-2: por 22
State of Hawaii, Department of Education Kamaile School (Existing)	8-5-2: 37
Wayne Tavares Kelley Tavares Antoinette Akana	8-5-2: 38
Alfred/Regina Ruis	8-5-2: 40
Jonelle Tanaka Trust	8-5-3: 36

The owners are identified on the Property Map for this segment in Appendix A (Sheet 21 of 26).

The City intends to acquire existing roadway lots and to create new roadway lots through subdivision, where required. The City would own and maintain the roadway segment.

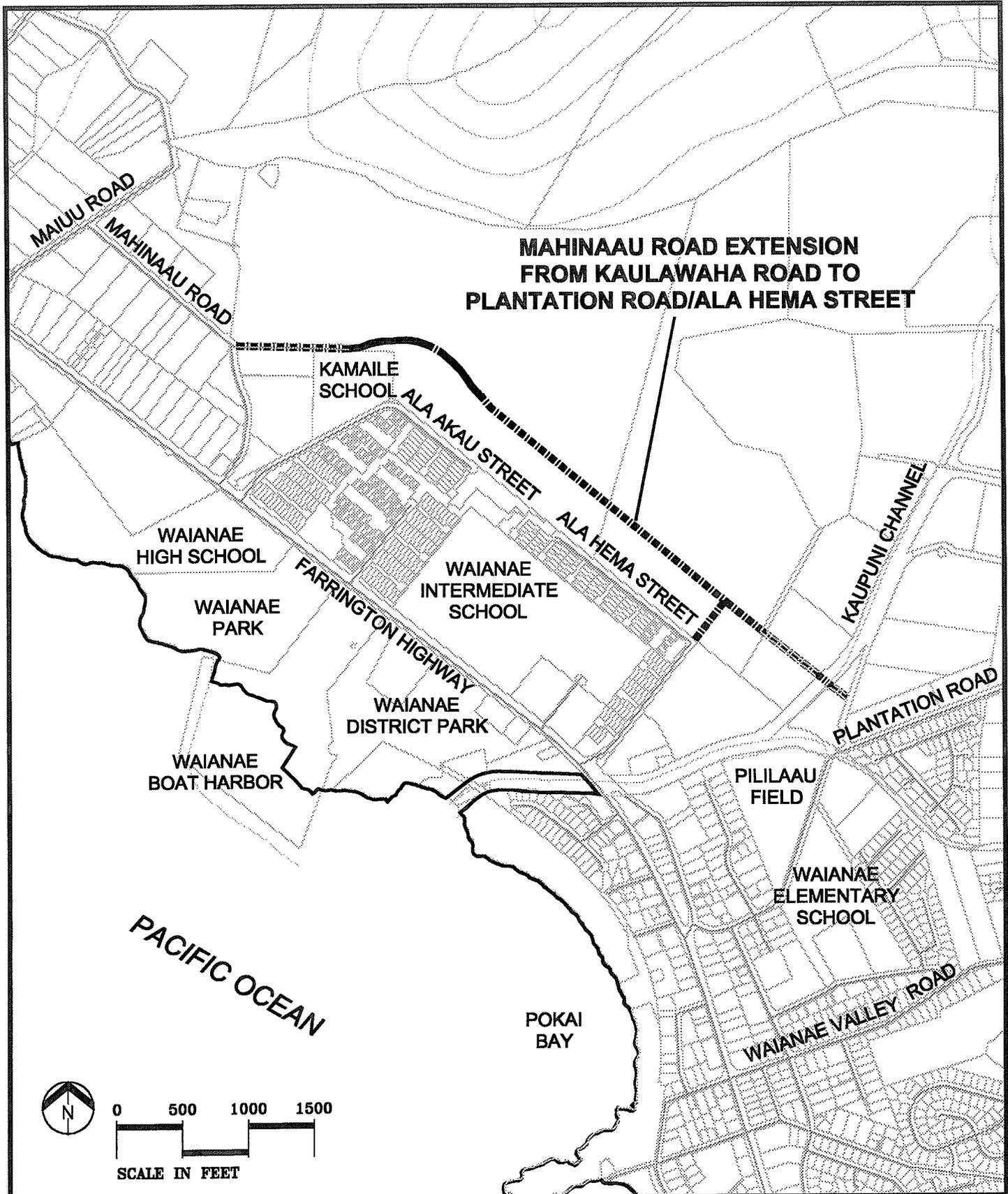


FIGURE 2 - 6
WAIAANAE COAST EMERGENCY ACCESS ROAD
MAHINAAU ROAD EXTENSION
 Kaulawaha Road to Ala Hema/Plantation Road

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2. Preliminary designs showed the Mahinaau Road Extension passing adjacent to the Eastern edge of the site proposed for the Kamaile School Expansion. The State Department of Education has been contacted to obtain the proposed expansion boundaries. The project alignment has since been adjusted to accommodate the school's plans. Ongoing coordination will be required.
3. Preliminary community input suggested designating the Mahinaau Road extension as a permanently open roadway. However, subsequent communications with the community revealed that opinions are split on whether this section of roadway should be permanently open or only available for "emergency use." Therefore, both options are still being considered. If only emergency use is allowed, the roadway will be gated and access would be under the direction of the Honolulu Police Department (Waianae and Kapolei Districts).

The estimated total cost for the Mahinaau Road Extension to Ala Hema Street/Plantation Road is \$1.16 million.

2.2.7 Kaulawaha Road Improvements (Sheets 22 through 26 of 26 - Appendix A) Mahinaau Road to Makaha Valley Road (Makaha Sub-District)

This segment of roadway (combined with the Mahinaau Road Extension, described above) is a major component of the WCEAR. It will provide access from Lualualei Naval Road to Makaha Valley Road without entering Farrington Highway (Figure 2-7).

Sheets 22 through 26 of 26 in Appendix A provide the preliminary engineering design (plan and profile as well as a map identifying affected properties) for this segment. Significant features of the Kaulawaha Road Improvements include:

1. The proposed road will follow the existing alignment of Kaulawaha Road, which is currently under private ownership. This roadway would connect to the proposed Mahinaau Roadway extension at the Mahinaau - Kaulawaha Road intersection. The existing right-of-way is 44 feet wide and is partially improved. A short section of the existing private roadway between Mahinaau Road and Makaha Valley Road is not continuous and the new roadway would generally follow an existing 20-foot wide access easement.
2. The Kaulawaha Road Extension would require a 44-foot wide ROW to accommodate 24 feet of asphaltic concrete pavement and 10-foot wide grassed shoulders. Affected property owners include:

May S. Kamakele Estate	8-4-19: 01
Santiago Oclaray Alagandro Tomas Geraldo/Adelaide Regidor Fiaavae Florendo	8-4-19: 20
John S. Souza III	8-4-19: 21
Beu-Kaakauhe Maokalani Partners	8-4-19: 22
Albert/Caridad Supnet	8-4-19: 23
Soledad Ligsay Trust	8-4-19: 24
RNI Limited Partnership	8-4-19: 25 8-4-20: 01
Makaha Valley Farms Ltd.	8-4-19: 26 (por. existing prvt roadway lot)
Alfredo Curammeng Trust	8-4-19: 27
Wing Chow/Beatrice Tam Kong Trust	8-4-20: 02 8-4-20: 03
Wu-Waianae Inc. (Por. existing private roadway lot)	8-5-02: 22 8-5-02: 23 8-5-02: 24
City and County of Honolulu, Board of Water Supply	8-5-02: 16
Salcedo Family Limited Partnership	8-5-02: 25
State of Hawaii	8-5-06: 10

The owners are identified on the Property Map in Appendix A for this segment of roadway (Sheet 25 of 26).

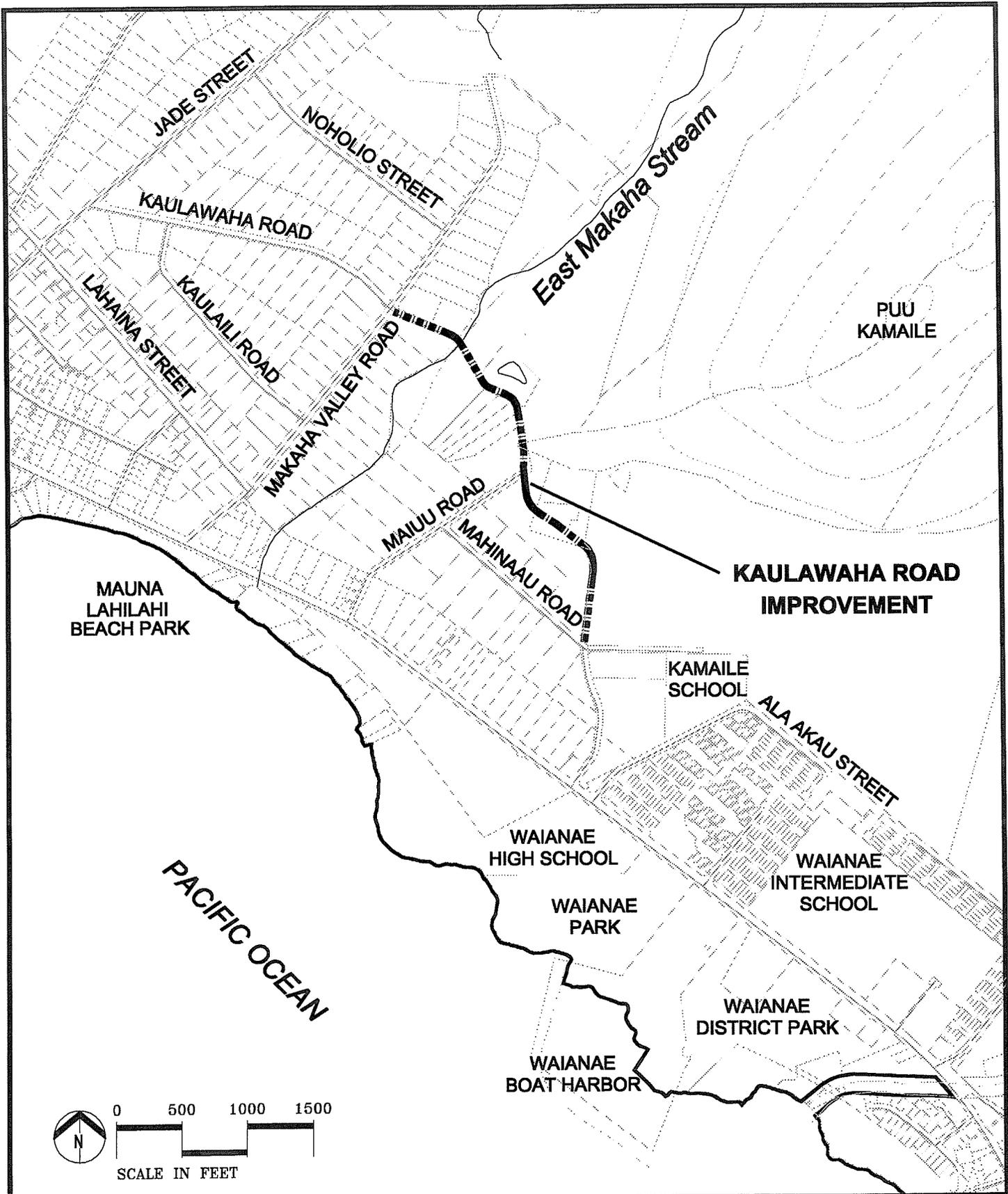


FIGURE 2 - 7
WAIANAЕ COAST EMERGENCY ACCESS ROAD
KAULAWAHA ROAD IMPROVEMENT
Makaha Valley Road to Mahinaau Road

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4. The City proposes to acquire existing roadway lots and create new roadway lots through subdivision where necessary. Realignment of a portion of the existing roadway lots is anticipated to mitigate archaeological (burial) concerns (see Section 3.2). All maintenance would be under the jurisdiction of the City & County.
5. A bridge structure will be required at the East Makaha Stream crossing to meet FIRM and City and County Drainage Standard requirements. The new bridge deck elevation will be 5-6 feet higher than the existing ground adjacent to the stream banks. The bridge will span the channel banks. Therefore, no Stream Channel Alteration Permit or Department of the Army Permit is anticipated. However, this will be verified prior to commencing with final design.
6. Additional coordination will be required between the City and the landowners of the lots adjacent to the East Makaha Stream Bridge. Existing driveways will need to be reconstructed to accommodate the 4 to 5-foot high retaining walls necessary to provide grade adjustments between the roadway lots and private property. The lots affected by these adjustments include tax map key (TMK) parcels: 8-4-19: 1, 3, 20 and 21.
7. A portion of the existing right-of-way/easements for the new connector road passes near areas that may contain Hawaiian burials. The original alignment was shifted approximately 40 feet makai to avoid excavation in the vicinity of potential burials or into the hillside area, which is associated with a heiau (see Section 3.4). The alignment in Appendix A represents the shifted alignment. No work will be completed on this section of roadway until all clearances have been received by lineal descendents, the Department of Land and Natural Resources State Historic Preservation Division (DLNR-SHPD) and the Oahu Burial Council. All physical work for this segment of roadway will be conducted under the supervision of an archaeological and/or a cultural monitor.
8. Preliminary community input suggested designating the Kaulawaha Road Improvements as a permanently open roadway. However, subsequent communications with the community revealed a number of people who are not in favor of this option due to safety and trash dumping concerns. Therefore, both options are still being considered. If only emergency use is allowed, the roadway will be gated and access would be under the direction of the Honolulu Police Department (Waianae and Kapolei Districts).
9. An alternate routing for a portion of the Kaulawaha Road extension could be the use of the existing Mahinaau Road and Maiuu Road to connect Kaulawaha Road (see Sheet 26 of 26 in Appendix A). The use of Mahinaau Road would only be considered if subsequent cultural or archaeological concerns for the proposed alignment (or modification of the alignment) shown in Appendix A can not be reconciled.

Mahinaau Road and Maiuu Road are existing 40-foot and 50-foot wide rights-of-ways, respectively. Improvements would include a 24-foot width of pavement within the existing ROW. Grassed shoulders would be 8 feet wide or 13 feet wide depending on the ROW width. No construction work would be required in private residential lots if this alternative were adopted.

The residents of Maiuu Road/Mahinaau Road oppose this alternative. Concerns expressed in public meetings include residences on Mahinaau Road with small children who would be exposed to increased traffic conditions if this alternative were adopted. Every effort will be made to find a feasible alignment for the Kaulawaha Road segment. Communications from the community have indicated that the use of a cultural monitor may be helpful in determining an appropriate path that avoids cultural and archaeological sites. Mahinaau Road will only be used if all efforts to use the Kaulawaha Road corridor fail.

The estimated total cost for the Kaulawaha Road Improvements is \$1.95 million. The estimated total cost for the alternative Mahinaau Road/Maiuu Road component is \$ 2.00 million.

2.3 OPERATIONAL PLAN

The Operational Plan provides a coordinated strategy that will be used by City agencies (Police, Civil Defense, Fire Department, etc.) to allow traffic to flow in an orderly and directed pattern under “Emergency Situations.” Emergency Situations are defined as events that stop or seriously impede traffic movement, including traffic accidents, water main breaks or other utility disruptions, major traffic accidents, police-related activities (i.e. hostage situations) and tsunami/hurricane events (i.e. sand blockage).

2.3.1 Routing

The WCEAR Project would construct previously identified roadway improvements (See Section 2.2) to connect existing roadways in order to provide a defined routing system to bypass segments of Farrington Highway. These bypasses will allow traffic movement along the Leeward Coast when the main traffic corridor (Farrington Highway) is impacted by emergency situations. The proposed Operational Plan was developed to provide a coordinated plan, recognized and used by City services (Police, Civil Defense and Fire Departments), to allow traffic to flow in an orderly and directed manner in an “Emergency Situation.” The following narrative describes the suggested routing based on the proposed roadway improvements and the existing roadway system.

A. Nanakuli Sub-District

The WCEAR identifies the improvement of Pohakunui Avenue from Laumania Avenue to Nanakuli Avenue including a re-designed connection to Farrington Highway at Nanakuli Avenue. Additional roadway improvements are also proposed for Pohakunui Avenue by the Department of Hawaiian Home Lands (DHHL) from Laumania Avenue to the Farrington Highway access at Piliokahe Beach Park. The Nanakuli Sub-District WCEAR improvements also identify a proposed roadway connector from Helelua Place to Lualualei Naval Road.

These improvements will allow “Operational Traffic Redirection” around “Emergency Situations” on Farrington Highway between the entrance to the Nanakuli Sub-District at Piliokahe Beach and Lualualei Naval Road. There is one 770-foot section of Farrington Highway between Haleakala Avenue and Helelua Street that has no alternate alignment. Use of the WCEAR by-pass roadway segments in conjunction with existing roads will allow a secondary routing through most of Nanakuli. Four routing options are shown on the Nanakuli Sub-District Operations Plan exhibit in Figures 2-8 and 2-9. Plan 3 solely identifies the 770-foot section of Farrington Highway that will have no by-pass option.

The following routing is recommended for use during emergency situations in the Nanakuli sub-district:

1. Emergency situation between Piliokahe Beach Park roadway connection with Farrington Highway and Nanakuli Avenue

Use Pohakunui Avenue (See Figure 2 - 8, Nanakuli Sub-District Plan - 1)

2. Emergency situation between Nanakuli Avenue and Haleakala Avenue

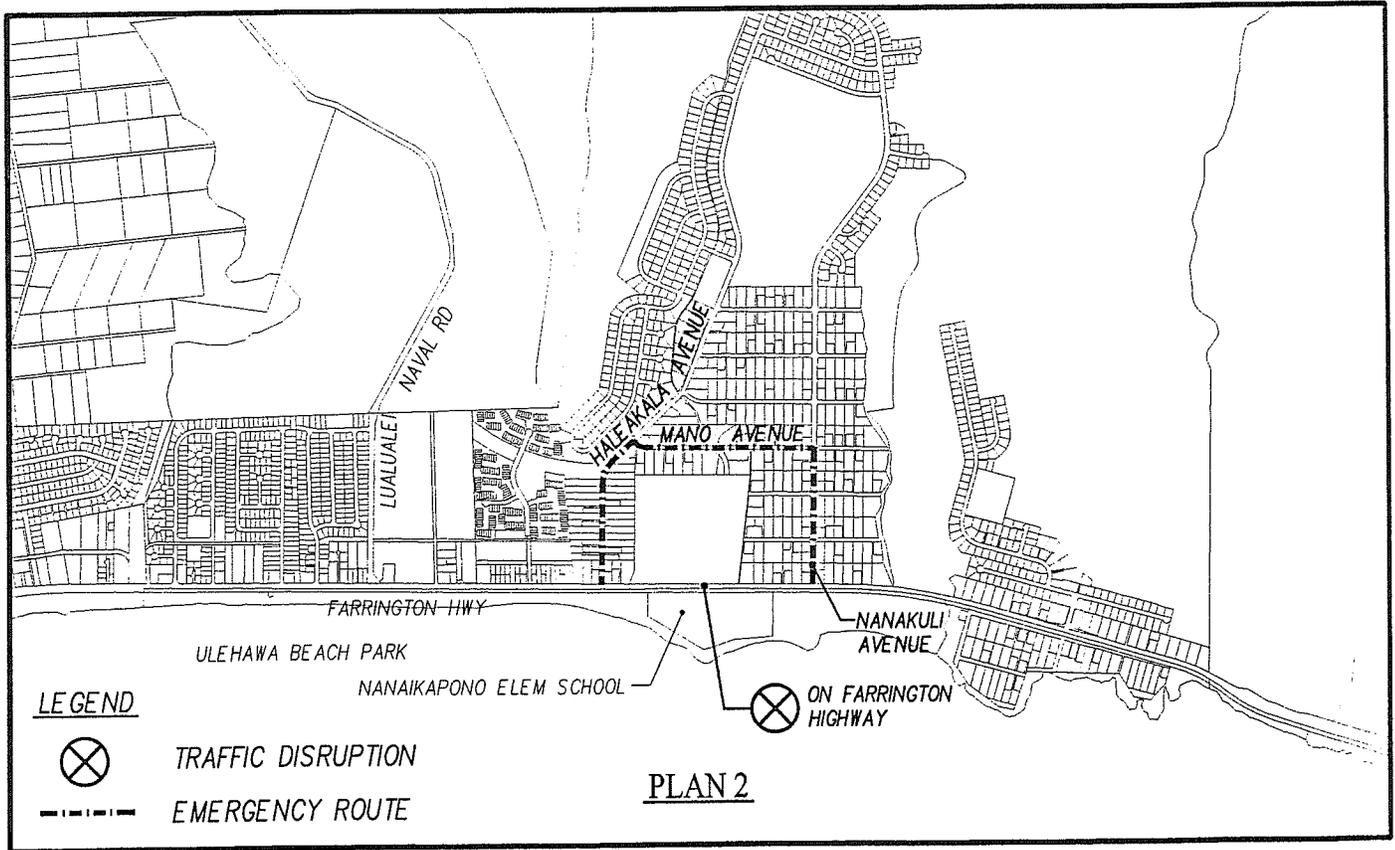
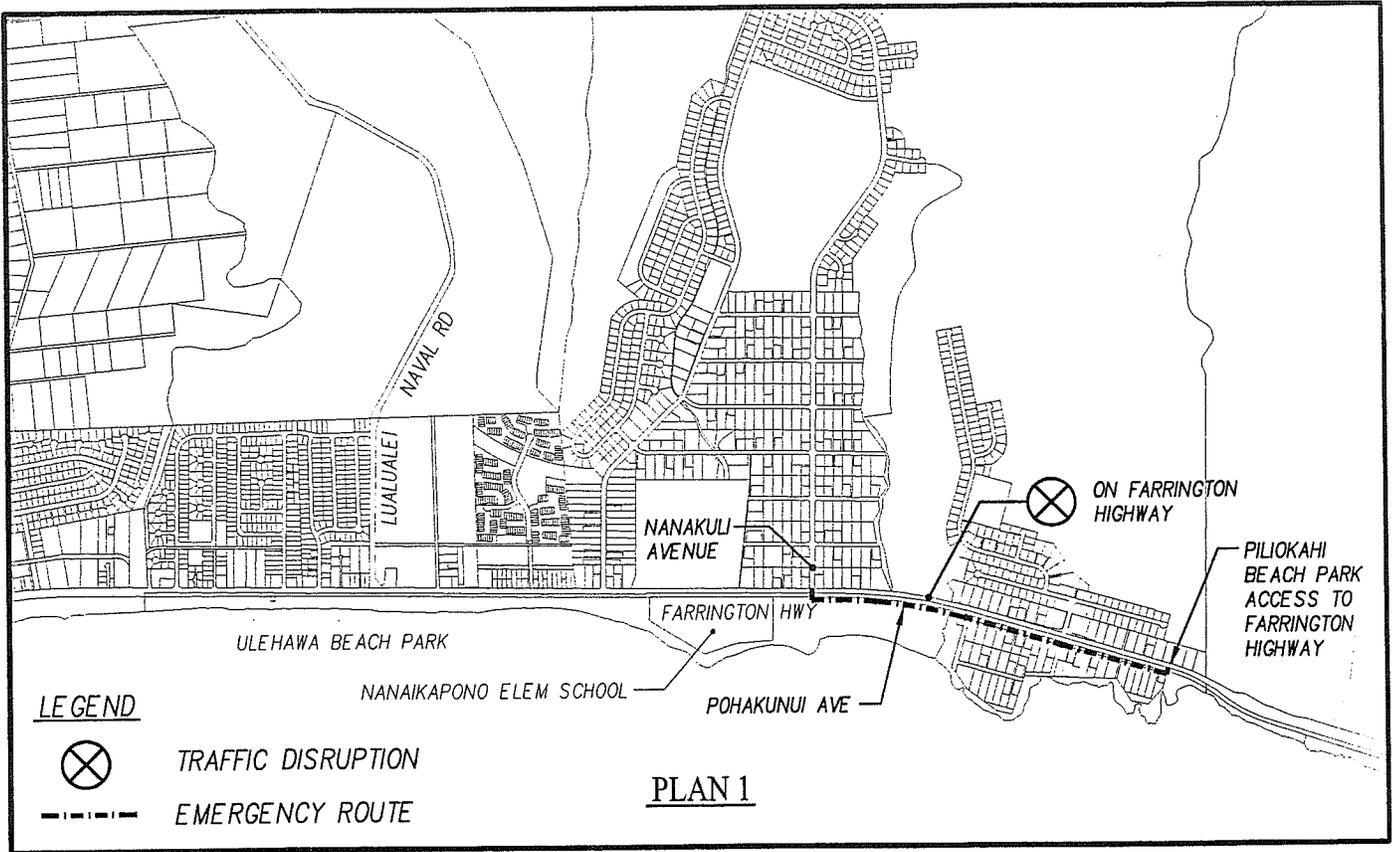
Use Nanakuli Avenue, Mano Street and Haleakala Street (See Figure 2-8, Nanakuli Sub-District Plan - 2)

3. Emergency Situation between Haleakala Avenue and Helelua Street

No emergency by-pass available (See Figure 2-9, Plan - 3)

4. Emergency situation between Helelua Street and Lualualei Naval Road

Use Helelua Street and Helelua Place (including extension) and Lualualei Naval Road (See Figure 2 - 9, Nanakuli Sub-District Plan - 4)



SCALE:
1" = 2000'

CAD DRAWING:
DEA-OP12

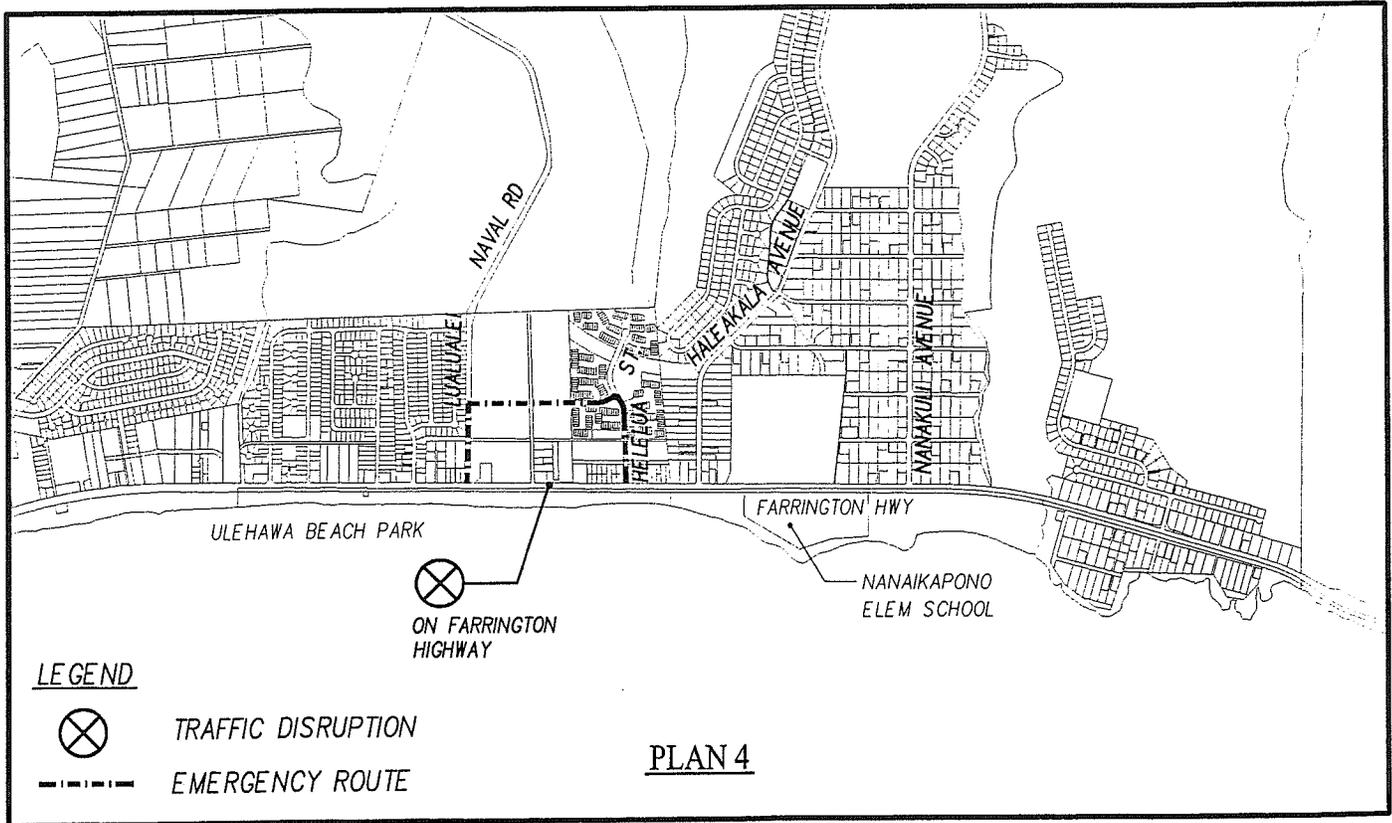
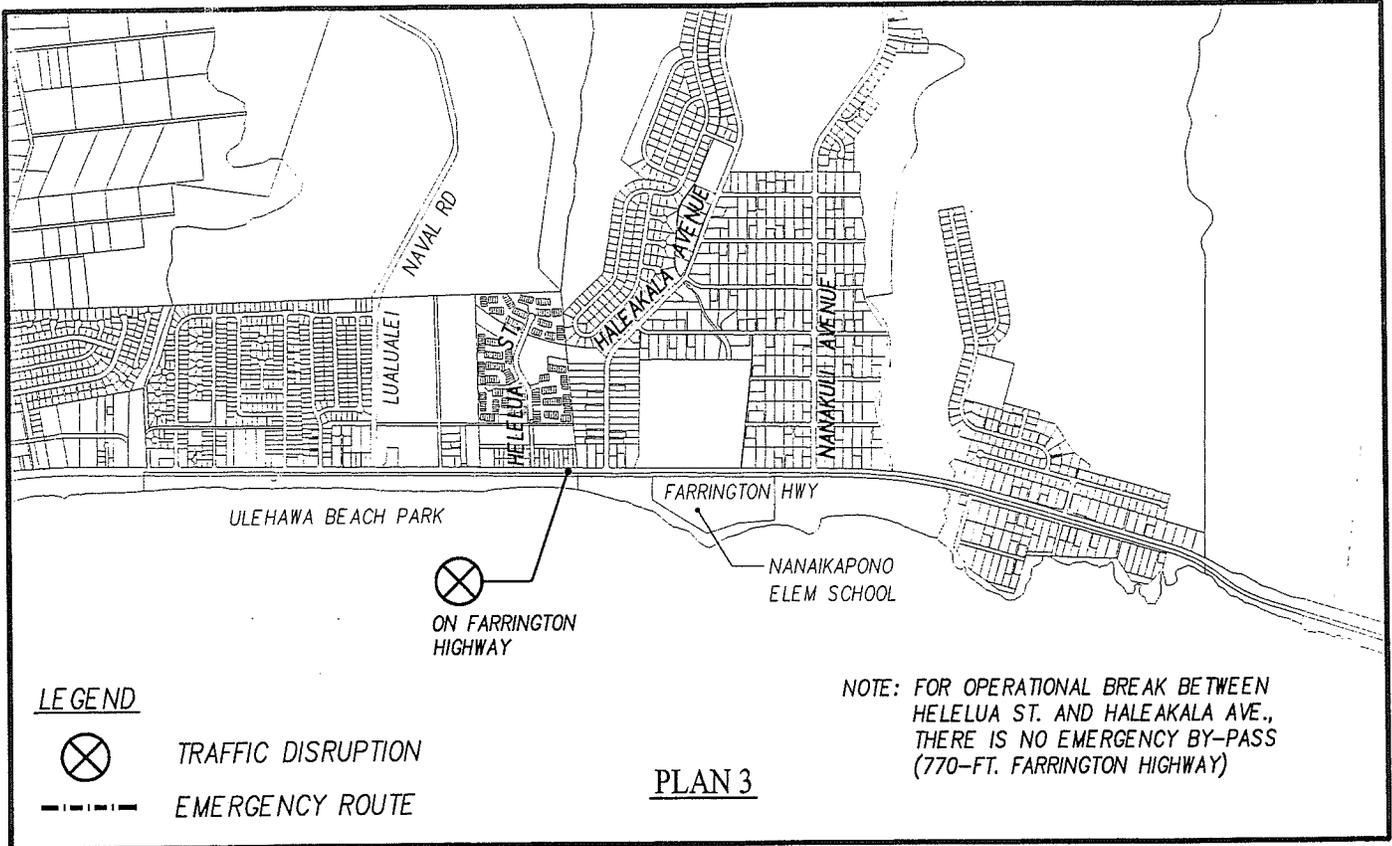
DATE:
NOV 17, 2001

**OPERATION PLANS
NANAKULI SUB-DISTRICT**



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CONSULTING ENGINEERS
841 Bishop Street Suite 1100

**FIGURE
2-8**



SCALE:
1" = 2000'

CAD DRAWING:
DEA-OP34

DATE:
NOV 17, 2001

**OPERATION PLANS
NANAKULI SUB-DISTRICT**



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**FIGURE
2-9**

The Nanakuli Sub-District Operational Plan primarily benefits “Emergency Situations” related to traffic accidents and utility disruptions and has limited benefits related to police activities (i.e., hostage situations) and weather events (i.e., coastal storms) due to its proximity to Farrington Highway and the coastline, respectively.

The U.S. Navy requested notification prior to the activation of the WCEAR system including the use of Lualualei Naval Road. This request will be conveyed to the Operational Plan Team and every effort will be made to comply with this request.

Traffic control during activation of the WCEAR is anticipated to be under the direction of the Police Department (the responsible agency).

B. Lualualei/Maili Sub-District

The WCEAR identifies two roadway segment improvements in the Lualualei/Maili sub-district. These include connectors from Lualualei Naval Road to Paakea Road and from Hakimo Road to Pakeke Street.

These improvements will allow “Operational Traffic Redirection” for “Emergency Situations” occurring at varying points on Farrington Highway between Lualualei Naval Road and Mailiilii Road.

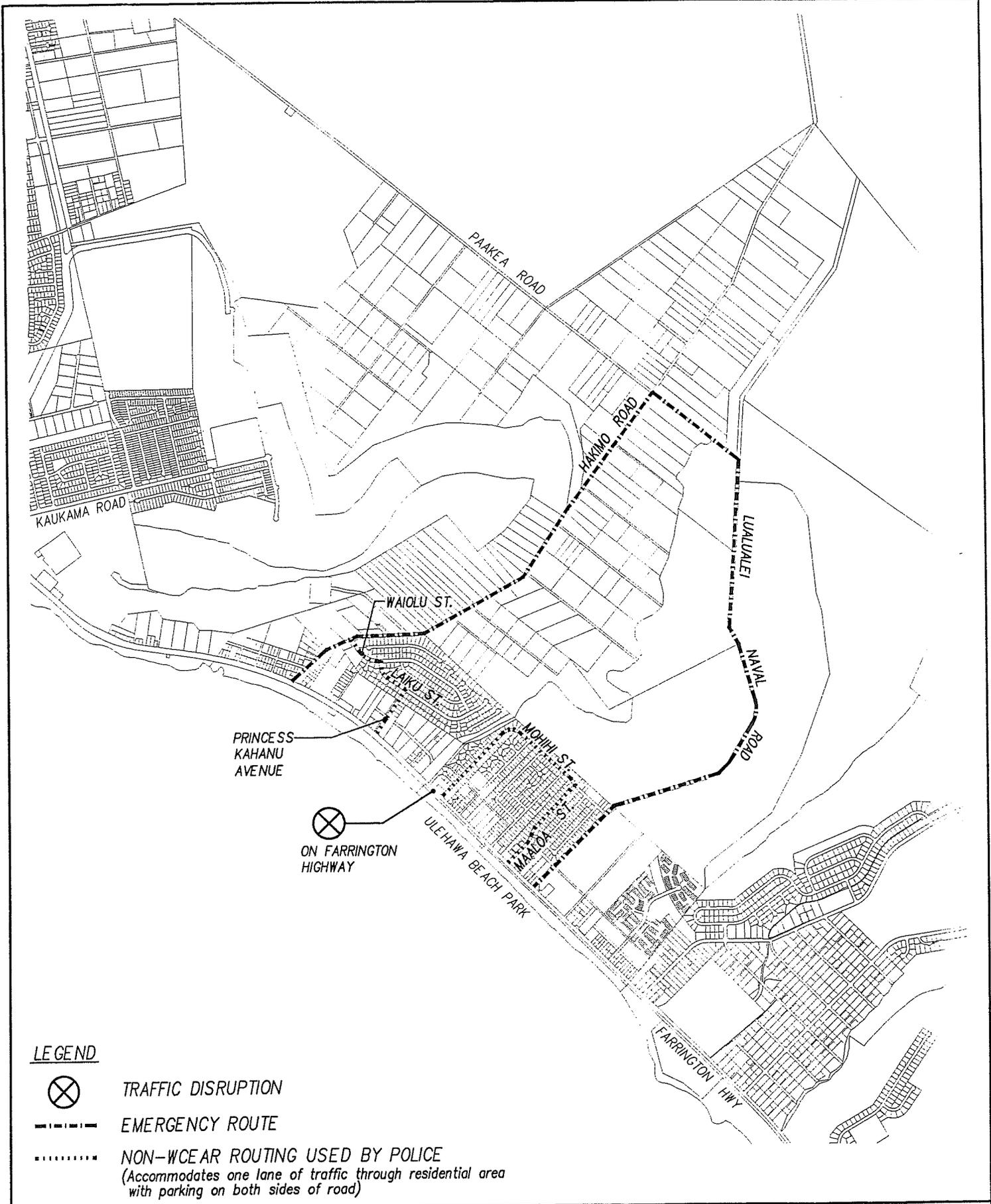
The following routing is recommended for use during emergency situations in the Lualualei/Maili sub-district:

1. Emergency situation between Lualualei Naval Road and Hakimo Road

Use Lualualei Naval Road, the new Paakea Road Improvements and Hakimo Road. (See Figure 2 – 10, Lualualei/Maili Sub-District Plan-1)

2. Emergency situation affecting Farrington Highway between Hakimo Road and Kaukama Road

Use permanently open roadway segments including Lualualei Naval Road, Paakea Road and Mailiilii Road to by-pass blocked sections of Farrington Highway. The proposed Pakeke Street to Hakimo Road connector roadway could be used as an alternative or as a supplement. (See Figure 2 – 11, Lualualei/Maili Sub-District Plan-2)



LEGEND

-  TRAFFIC DISRUPTION
-  EMERGENCY ROUTE
-  NON-WEAR ROUTING USED BY POLICE
(Accommodates one lane of traffic through residential area with parking on both sides of road)

SCALE:
1" = 2000'

CAD DRAWING:
DEA-MAIL1

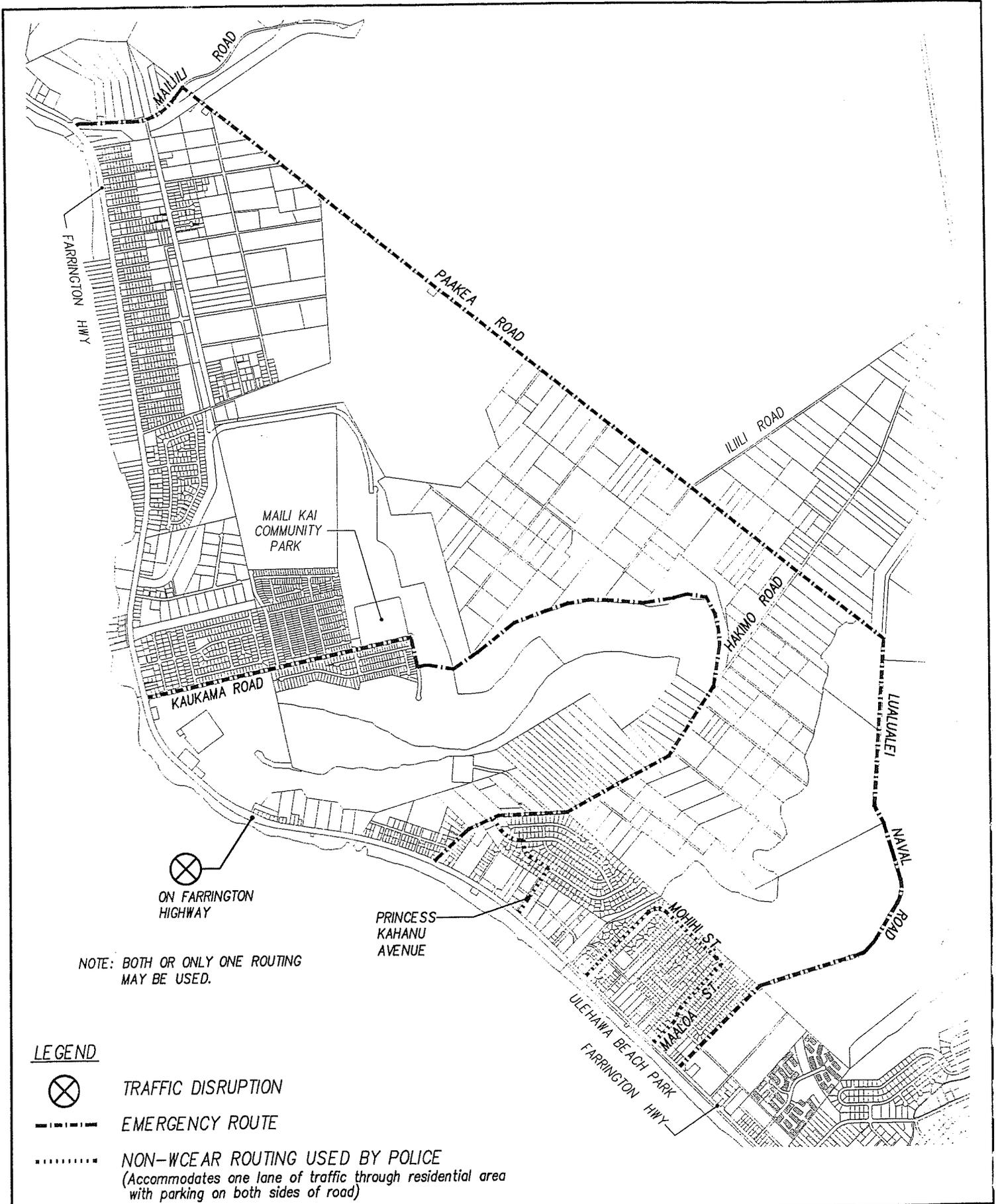
DATE:
NOV 17, 2001

**OPERATION PLANS
LUALUALEI / MAILI
SUB-DISTRICT PLAN - 1**


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**FIGURE
2-10**



SCALE:
1" = 2000'

CAD DRAWING:
DEA-MAILI2

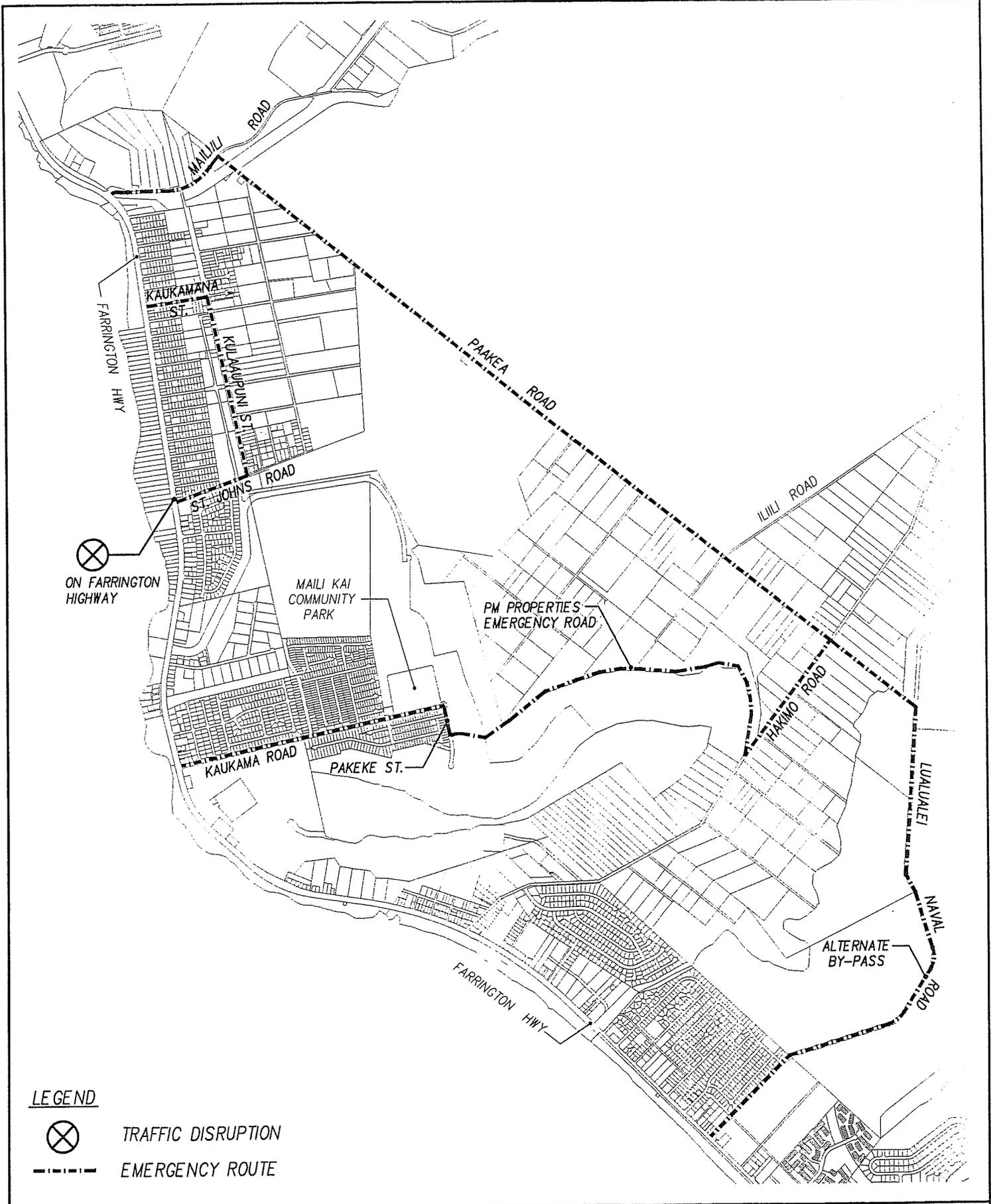
DATE:
NOV 17, 2001

**OPERATION PLANS
LUALUALEI / MAILI
SUB-DISTRICT PLAN - 2**


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**FIGURE
2-11**



SCALE:
1" = 2000'

CAD DRAWING:
DEA-MAIL3

DATE:
NOV 17, 2001

OPERATION PLANS
LUALUALEI / MAILI
SUB-DISTRICT PLAN - 3



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FIGURE
2-12

3. Emergency Situation on Farrington Highway between Kaukama Road and Mailiilii Road

Use Kaukama Road, Pakeke Street, the Pakeke Street to Hakimo Road connector, Hakimo Road, Paakea Road and Mailiilii Road (See Figure 2 – 12, Lualualei/Maili Sub-District Plan-3)

However, it should be noted that use of Lualualei Naval Road, Paakea Road and Mailiilii Road is another by-pass option using permanently open roadway segments.

In the event of an “Emergency Situation” on Farrington Highway between Kaukamana Street and St. Johns Road another by-pass is available using Kulaaupuni Street. This shorter by-pass section is shown on Plan 3.

Traffic control during activation of the WCEAR is anticipated to be under the direction of the Police Department (the responsible agency).

C. *Waianae Sub-District*

The WCEAR identifies existing roadways that are suitable for two-way traffic (including public transportation - The Bus) to by-pass Farrington Highway. The by-pass options extend between Mailiilii Road and Old Government Road. There is also an option to use existing roads makai of Farrington Highway in this sub-district.

The following routing is recommended for use during emergency situations in the Waianae sub-district:

1. Emergency situation between Mailiilii Road and Waianae Valley Road/Old Government Road

Use Mailiilii Road connecting to Lualualei Homestead Road, Puhawai Road, Halona Street connecting back to Lualualei Homestead Road, Mill Street to Waianae Valley Road or Old Government Road (using a short leg of Plantation Road (See Figure 2 – 13, Waianae Sub-District Plan -1).

2. Emergency situation between Leihoku Street and Waianae Valley Road/Bayview Street

Use Pokai Bay Street (See Figure 2 - 13, Waianae Sub-District Plan - 1)

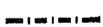
Traffic control during activation of the WCEAR for both Waianae Sub-District scenarios is anticipated to be under the direction of the Police Department (the responsible agency).



LEGEND



TRAFFIC DISRUPTION



EMERGENCY ROUTE

SCALE:
1" = 2000'

CAD DRAWING:
DEA-WAIANAЕ1

DATE:
NOV 17, 2001

OPERATION PLANS
WAIANAЕ SUB-DISTRICT
PLAN - 1



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FIGURE

2-13

D. Waianae/Makaha Sub-District

The WCEAR identifies two roadway improvement segments that overlap both the Waianae Sub-District and the Makaha Sub-District. Therefore, the “Operational Plan” description for the Waianae and Makaha Sub-Districts also has a section that describes the combined Sub-District Operational Plans.

The Waianae/Makaha WCEAR improvements consist of a connector roadway between Makaha Valley Road and Mahinaau Road and a further extension to Plantation Road/Ala Hema Street.

The existing roadway network combined with the two proposed roadways, provides for “Operational Traffic Redirection” around an “Emergency Situation” affecting Farrington Highway between Waianae Valley Road and Makaha Valley Road.

The following routing is recommended for use during emergency situations in the Waianae/Makaha sub-district:

1. Emergency Situation between Ala Hema Street and Makaha Valley Road

Use new Ala Hema Street, the new Mahinaau Road Extension, the Kaulawaha Road Improvement and Makaha Valley Road to move traffic. (See Figure 2 – 14, Waianae/Makaha Sub-District Plan-1)

2. Emergency Situation between Waianae Valley Road and Ala Hema Street

Use Ala Hema Street, a portion of the new Mahinaau Road Extension, and Plantation Road connecting to Waianae Valley Road to move traffic. (See Figure 2 – 14, Waianae/Makaha Sub-District Plan-2)

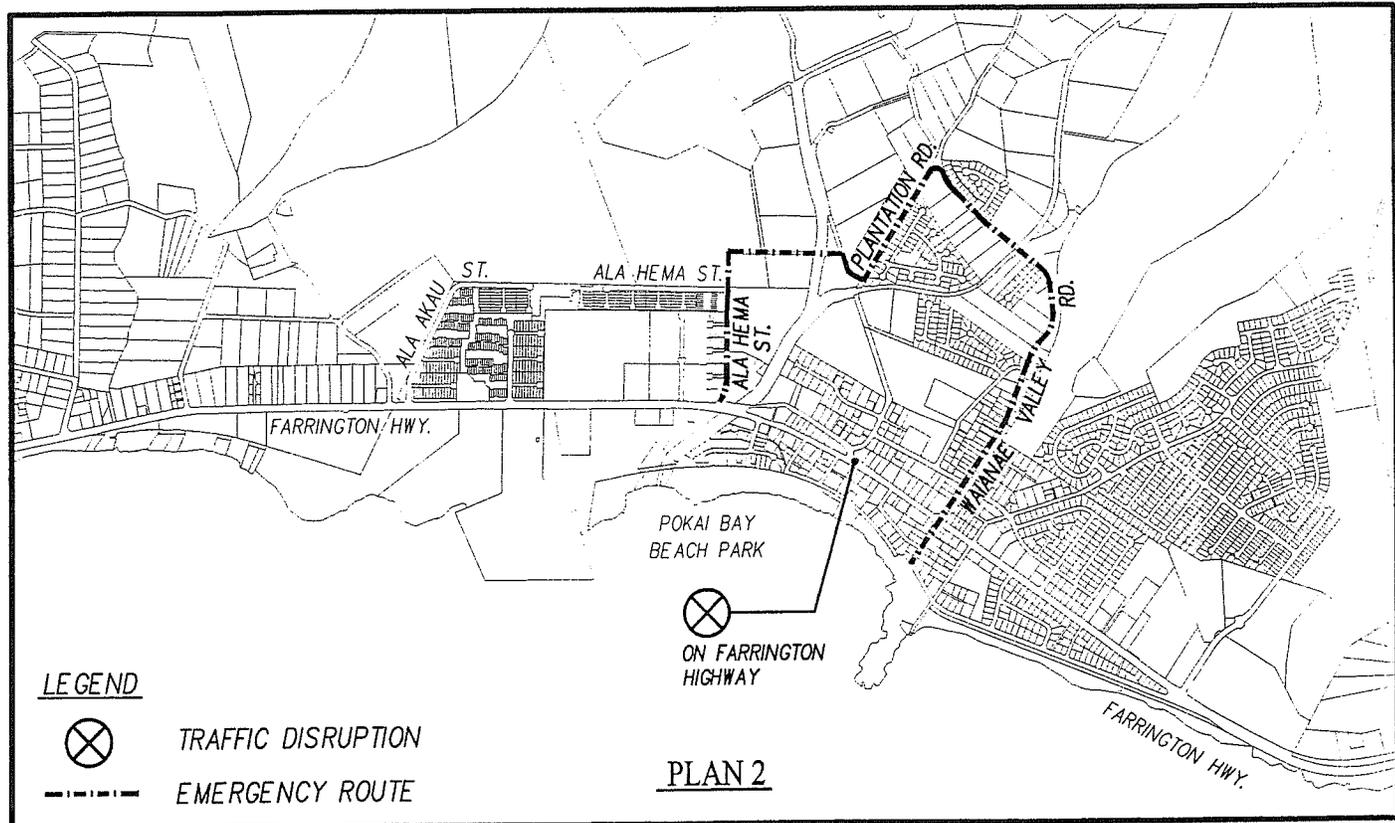
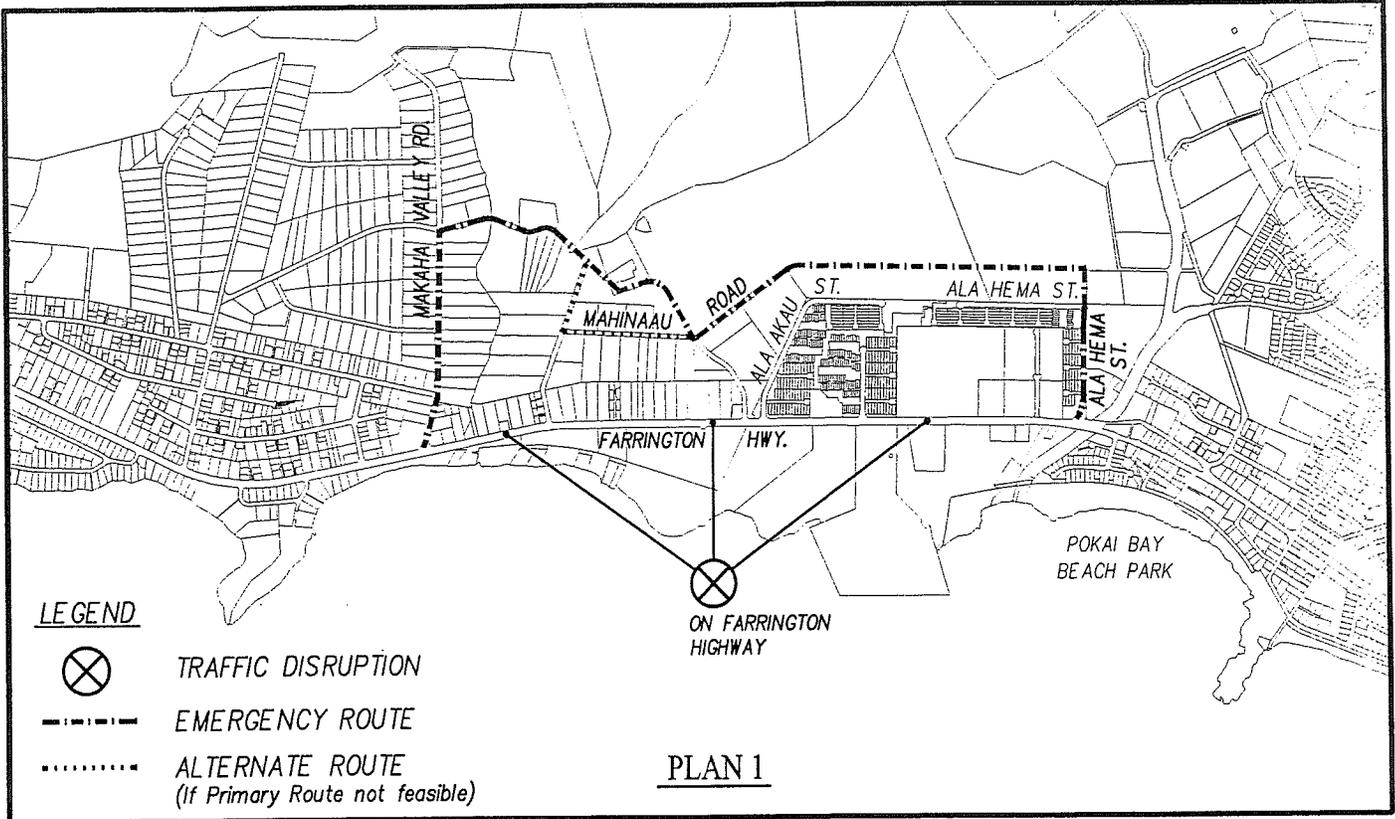
Traffic control during activation of the WCEAR is anticipated to be under the direction of the Police Department (the responsible agency).

E. Makaha Sub-District

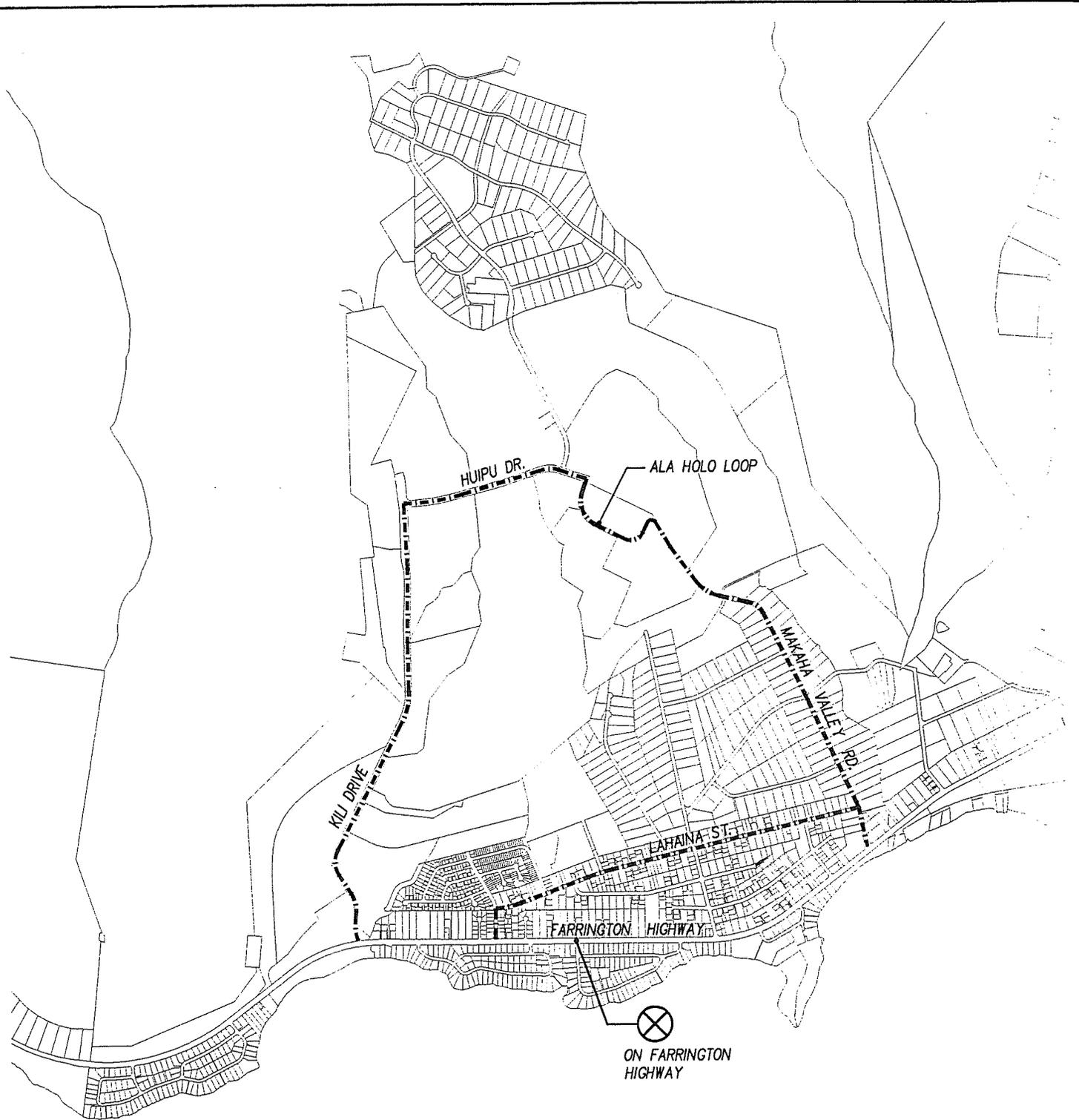
The WCEAR recognizes existing roadways that are suitable for two-way traffic (including public transportation - The Bus) to bypass Farrington Highway between Makaha Valley Road and Kili Drive. There is also an intermediate option between Makaha Valley Road and Water Street.

1. Emergency situation between Makaha Valley Road and Kili Drive

Use Makaha Valley Road, Ala Holo Loop, Huipu Drive and Kili Drive (See Figure 2 – 15, Makaha Sub-District Plan -1)



<p>SCALE: 1" = 2000'</p> <p>CAD DRAWING: DEA-WAIANAЕ</p> <p>DATE: NOV 17, 2001</p>	<p>OPERATION PLANS WAIANAЕ / MAKAHA SUB-DISTRICT</p>	 <p>Gray-Hong-Bills-Nojima & Associates, Inc CONSULTING ENGINEERS</p> <p>841 Bishop Street Suite 1100</p>	<p>FIGURE 2-14</p>
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LEGEND



TRAFFIC DISRUPTION



EMERGENCY ROUTE

SCALE:

1" = 2000'

CAD DRAWING:

DEA-MAKAHA

DATE:

NOV 17, 2001

OPERATION PLANS
MAKAHA SUB-DISTRICT
PLAN - 1



Gray-Hong-Bills-Nojima & Associates, Inc
CONSULTING ENGINEERS

841 Bishop Street

Suite 1100

FIGURE

2-15

2. Emergency situation between Makaha Valley Road and Water Street

Use Makaha Valley Road, Lahaina Street and Water Street (See Figure 2 – 15, Makaha Sub-District Plan - 1)

Traffic control during activation of the WCEAR is anticipated to be under the direction of the Police Department (the responsible agency).

F. Overall Leeward Coast Emergency Event

“Emergency Situations” affecting multiple sections of Farrington Highway between Kili Drive and Lualualei Naval Road can occur. This applies to events such as hurricanes, tsunamis and their resulting damage including sand deposition on Farrington Highway. The following emergency routing is proposed to accommodate traffic in an overall Leeward Coast “Event.”

The use of Kili Drive, Huipu Drive, Ala Holo Loop, Makaha Valley Road, the new Kaulawaha Roadway Improvement, the new Mahinaau Road Extension, Plantation Road, Waianae Valley Road, Mill Street, Lualualei Homestead Road, Halona Road, Puhawai Road, Lualualei Homestead Road, Mailiili Road, Paakea Road and the new Paakea Road Improvement (to Lualualei Naval Road) allows traffic movement along the Leeward Coast without using Farrington Highway (See Figure 2 – 16, Operation Plan-Overall Leeward Coast).

However, it should be recognized that under this scenario, further traffic movement is dependant on the accessibility of Farrington Highway through Nanakuli. If any portion of roadway through Nanakuli is impassable, the only roadway available to move traffic out of Leeward Oahu is Lualualei Naval Road connecting to Kolekole Road and exiting the Leeward Coast via Kolekole Pass.

Traffic control is anticipated to be under the direction of the Police Department if traffic can be redirected through the Nanakuli Sub-District. However, if Kolekole Pass must be utilized, joint traffic control must be established and implemented by both the Police Department and the U.S. Navy. The Kolekole Pass option is not an official part of the WCEAR and its use is solely up to the discretion of the U.S. Navy.

The benefit of the Waianae Coast Emergency Road system under major emergency situations is that emergency relief efforts can be focused on the Nanakuli area rather than on multiple sections of Farrington Highway.

2.3.2 Implementation

The preceding section describes the routing options that are available to by-pass Farrington Highway. However, an equally important task of the plan is implementation. To that end operational plan meetings have been held among the following agencies:

- Honolulu Police Department (Kapolei and Waianae Districts)
- Honolulu Fire Department
- Department of Transportation Services-Public Transit Division (The Bus)
- Oahu Civil Defense
- Emergency Services Department (Ambulance)
- Board of Water Supply

The purpose of the meetings was to identify the WCEAR emergency routing plans and to establish a policy for implementation and coordination. The following operational plan implementation policy has been proposed:

The Honolulu Police Department is the primary party responsible for activating the WCEAR routing around Farrington Highway. Rerouting will be implemented upon the Police Department's arrival and assessment. The Police Department will station personnel at by-pass roadway intersections and at major turns to direct traffic flow.

When rerouting is activated, the only plan scenarios that will be used are those identified in Section 2.3.1. Previously used rerouting options that varied considerably and may not have been capable of accommodating public transportation will be abandoned in favor of the operational plan routing proposed in the Operational Plan exhibits.

Depending on the emergency incident, either two lanes of by-pass traffic flow (one lane in each direction) or one lane (one direction only) will be established. If traffic flow in one direction on Farrington Highway is still possible only one lane of Farrington Highway by-pass traffic may be implemented. This decision is left to the discretion of the Police Department.

Certain sections of the WCEAR by-pass system are gated and only available for use in emergency situations. Keys for all gated sections will be kept at the Kapolei Police Station. A duplicate set of keys will also be kept at the Waianae Police Station.

Supporting agencies will coordinate with the Police Department. Coordination activities include:

1. The Bus System - The WCEAR by-pass routes are capable of accommodating standard City Buses used by The Bus. However, they are not capable of accommodating the Country Express

articulated buses. The transfer coordination that will be required between the Police Department and the Department of Transportation Services already occurs in emergencies and will continue.

2. Utility agencies such as the Board of Water Supply must keep the Police Department informed of the length of disruption and general overall coordination required during an emergency situation.
3. The U.S. Navy has requested to be notified prior to activating WCEAR segments including use of Lualualei Naval Road, which is currently owned by the Navy. Correspondence has been ongoing regarding conveyance of Lualualei Naval Road to the City. Regardless of ownership, notification of WCEAR activation is still requested, as Lualualei Naval Road will continue to be used as a primary access route for the support of Naval Operations in Lualualei. The Police Department in conjunction with the Oahu Civil Defense Office will contact the U. S. Navy.

A public information document identifying the by-pass routing options will be developed. This could be distributed to all Waianae Coast residents through mailings, postings in public locations or by creating an insert for the phone book.

2.4 PROJECT PHASING AND COST

The estimated construction costs for all six connector roadway improvements total approximately \$7.93 million (Table 2-2). The total estimated construction cost would be approximately \$7.97 million if the Mahinaau Road alternative is constructed in place of the Kaulawaha Road improvements between Kaulawaha Road and Maiuu Road.

Construction costs do not include land acquisition costs. Specific costs will be discussed with each landowner in the final design stage. Expected costs include Nominal transfer fees of \$10 for park land and existing roadway lots and \$2 per square foot for agricultural land.

Construction could begin in the third quarter of calendar year 2002. A community meeting held on September 12, 2001 identified the preferred order of construction for the various connector roadways. Priority fell on the Nanakuli connectors and moved sequentially up the coast from Lualualei/Maili to Waianae to Makaha.

TABLE 2 - 2
WAIANAE COAST EMERGENCY ACCESS ROAD
PHYSICAL IMPROVEMENTS COST ESTIMATES

ITEM NO.	EST. QTY.	DESCRIPTION	UNIT PRICE	
<u>NANAKULI MAKAI ROADWAY IMPROVEMENTS</u>				
1	2.5	Acres, Clearing and grubbing.	\$ 2,000	<u>\$ 5,000</u>
2	4,300	Sq. Yds., Asphaltic concrete pavement, 2-1/2" thick, in place complete.	\$ 15	<u>\$ 64,500</u>
3	4,300	Sq. Yds., Base course, 8" thick, in place complete.	\$ 25	<u>\$ 107,500</u>
4	2,200	Cu. Yds., Select borrow subbase, including removal of unsuitable material (to be used only as directed or approved by the Engineer), in place complete.	\$ 40	<u>\$ 88,000</u>
5	9,000	Cu. Yds., Unclassified embankment, including excavation and hauling from borrow site, (excavation = 2,000 cu. yds.), in place complete.	\$ 25	<u>\$ 225,000</u>
6	1	Ea., Bridge structure with headwall piers and roadway grading, in place complete.	\$ 1,500,000	<u>\$ 1,500,000</u>
7	1	Ea., HECO vault relocation and Nanakuli traffic signal modification, in place complete.	\$ 125,000	<u>\$ 125,000</u>
TOTAL ESTIMATE				<u><u>\$ 2,115,000</u></u>
<u>HELELUA PLACE EXTENSION</u>				
1	1.2	Acres, Clearing and grubbing.	\$ 2,000	<u>\$ 2,400</u>
2	2,000	Sq. Yds., Asphaltic concrete pavement, 2-1/2" thick, in place complete.	\$ 15	<u>\$ 30,000</u>
3	2,000	Sq. Yds., Base course, 8" thick, in place complete.	\$ 25	<u>\$ 50,000</u>
4	1,500	Cu. Yds., Select borrow subbase, including removal of unsuitable material (to be used only as directed or approved by the Engineer), in place complete.	\$ 40	<u>\$ 60,000</u>
5	12,000	Cu. Yds., Unclassified embankment, including excavation and hauling from borrow site, (excavation = 0 cu. yd.), in place complete.	\$ 25	<u>\$ 300,000</u>
TOTAL ESTIMATE				<u><u>\$ 442,400</u></u>

TABLE 2 - 2 (CONTINUED)
WAIANAE COAST EMERGENCY ACCESS ROAD
PHYSICAL IMPROVEMENTS COST ESTIMATES

ITEM NO.	EST. QTY.	DESCRIPTION	UNIT PRICE	
PAAKEA ROAD EXTENSION				
1.8	Acres,	Clearing and grubbing.	\$ 2,000	\$ <u>3,600</u>
800	Cu. Yds.,	Concrete pavement removal.	\$ 50	\$ <u>40,000</u>
4,600	Sq. Yds.,	Asphaltic concrete pavement, 2-1/2" thick, in place complete.	\$ 15	\$ <u>69,000</u>
4,600	Sq. Yds.,	Base course, 8" thick, in place complete.	\$ 25	\$ <u>115,000</u>
2,300	Cu. Yds.,	Select borrow subbase, including removal of unsuitable material (to be used only as directed or approved by the Engineer), in place complete.	\$ 40	\$ <u>92,000</u>
4,000	Cu. Yds.,	Unclassified embankment, including excavation and hauling from borrow site, (excavation = 0 cu. yd.), in place complete.	\$ 25	\$ <u>100,000</u>
1	Ea.,	Bridge structure with headwall piers and roadway grading, in place complete.	\$ 750,000	\$ <u>750,000</u>
1,700	Lin. Ft.,	Overhead street lighting, in place complete.	\$ 40	\$ <u>68,000</u>
		TOTAL ESTIMATE		\$ <u><u>1,237,600</u></u>
PAKEKE STREET TO HAKIMO ROAD				
1	6.3	Acres, Clearing and grubbing.	\$ 2,000	\$ <u>12,600</u>
2	14,027	Sq. Yds., Asphaltic concrete pavement, 2-1/2" thick, in place complete.	\$ 15	\$ <u>210,405</u>
3	14,027	Sq. Yds., Base course, 8" thick, in place complete.	\$ 25	\$ <u>350,675</u>
4	7,015	Cu. Yds., Select borrow subbase, including removal of unsuitable material (to be used only as directed or approved by the Engineer), in place complete.	\$ 40	\$ <u>280,600</u>
5	6,000	Cu. Yds., Unclassified embankment, including excavation and hauling from borrow site, (excavation = 0 cu. yd.), in place complete.	\$ 25	\$ <u>150,000</u>
6	10	Lin. Ft., 48" Drain pipe, including unclassified excavation, backfill & pipe cushion, in place complete.	\$ 300	\$ <u>3,000</u>
7	100	Sq. Ft., Rip-rap lining for pipe outlet, in place complete.	\$ 100	\$ <u>10,000</u>
		TOTAL ESTIMATE		\$ <u><u>1,017,280</u></u>

TABLE 2 - 2 (CONTINUED)
WAIANAE COAST EMERGENCY ACCESS ROAD
PHYSICAL IMPROVEMENTS COST ESTIMATES

ITEM NO.	EST. QTY.	DESCRIPTION	UNIT PRICE	
<u>MAHINAAU ROAD EXTENSION TO ALA HEMA/PLANTATION ROAD</u>				
1	6.5	Acres, Clearing and grubbing.	\$ 2,000	<u>\$ 13,000</u>
2	13,000	Sq. Yds., Asphaltic concrete pavement, 2-1/2" thick, in place complete.	\$ 15	<u>\$ 195,000</u>
3	13,000	Sq. Yds., Base course, 8" thick, in place complete.	\$ 25	<u>\$ 325,000</u>
4	6,500	Cu. Yds., Select borrow subbase, including removal of unsuitable material (to be used only as directed or approved by the Engineer), in place complete.	\$ 40	<u>\$ 260,000</u>
5	7,000	Cu. Yds., Unclassified embankment, including excavation and hauling from borrow site, (excavation = 0 cu. yd.), in place complete.	\$ 25	<u>\$ 175,000</u>
6	4,900	Lin. Ft., Overhead street lighting, in place complete.	\$ 40	<u>\$ 196,000</u>
		TOTAL ESTIMATE		<u><u>\$ 1,164,000</u></u>
<u>KAULAWAHA ROAD IMPROVEMENTS TO MAHINAAU ROAD</u>				
1	4.5	Acres, Clearing and grubbing.	\$ 2,000	<u>\$ 9,000</u>
2	8,600	Sq. Yds., Asphaltic concrete pavement, 2-1/2" thick, in place complete.	\$ 15	<u>\$ 129,000</u>
3	8,600	Sq. Yds., Base course, 8" thick, in place complete.	\$ 25	<u>\$ 215,000</u>
4	4,300	Cu. Yds., Select borrow subbase, including removal of unsuitable material (to be used only as directed or approved by the Engineer), in place complete.	\$ 40	<u>\$ 172,000</u>
5	22,000	Cu. Yds., Unclassified embankment, including excavation and hauling from borrow site, (excavation = 0 cu. yd.), in place complete.	\$ 25	<u>\$ 550,000</u>
6	1	Ea., Bridge structure with headwall piers and roadway grading, in place complete.	\$ 750,000	<u>\$ 750,000</u>
7	3,200	Lin. Ft., Overhead street lighting, in place complete.	\$ 40	<u>\$ 128,000</u>
		TOTAL ESTIMATE		<u><u>\$ 1,953,000</u></u>
		ALTERNATE USING MAIUU STREET/MAHINAAU ROAD		<u><u>\$ 2,000,000</u></u>

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SECTION 3 DESCRIPTION OF AFFECTED ENVIRONMENT, IMPACTS & MITIGATION

3.1 AIR QUALITY

Existing Conditions

Air pollution generators within the project corridor include natural sources such as sea spray, and man-made sources such as vehicle emissions from Farrington Highway and its various feeder roads. Prevailing winds are trade winds from the northeast.

Anticipated Impacts and Mitigative Measures

Potential sources of air pollution as a result of the project include short-term generation of motor vehicle and heavy equipment emissions, and particulate matter and fugitive dust from the removal or placement of asphalt, concrete and soil during the construction phase. Motor vehicle emissions may temporarily increase on designated roads when the emergency access route is active.

The project is not anticipated to significantly impact long-term air quality because daily traffic patterns are not expected to change (see Section 3.14 for traffic-related impacts). Dust control practices in accordance with applicable State Department of Health Administrative Rules, Title 11, Chapter 60.1, "Air Pollution Control" would be followed to mitigate construction-related impacts. Frequent watering of the soil would reduce the amount of dust emissions that are generated during construction, and planting landscaping as soon as possible would help to reduce dust emissions from exposed soils.

Those land uses adjacent to the roads included in the WCEAR routing may experience temporary increases in motor vehicle emissions during those times when a particular section of bypass route is activated. However, this impact is expected to be temporary, infrequent, and restricted to emergency situations.

The WCEAR does not include elements that would permanently increase airborne pollutants, such as housing that would generate increased traffic (see Section 3.11). The Project goal is to move traffic more efficiently during emergency situations, which will result in less pollution emission during those times due to shorter periods vehicles will spend idle in traffic. No mitigative measures are proposed.

3.2 ARCHAEOLOGICAL, HISTORICAL AND CULTURAL SITES

The complete findings of an Archaeological Inventory Survey for the project area are detailed in the report titled, An Archaeological Inventory Survey Report for the Waianae Coast Emergency Access

Road, Waianae District, Island of Oahu (Archaeological Consultants of the Pacific, Inc., November 2001), which is included as Appendix B. The findings are summarized below.

The purpose of these archaeological investigations was to determine if significant historic and/or cultural properties exist within the project limits, to properly document them, and to evaluate their significance, including their eligibility for inclusion in the National Register of Historic Places. The investigations also recommend mitigation of potential impacts future construction activities may have upon potentially significant historic resources.

The tasks performed meet the requirements specified by Section 106 of the National Historic Preservation Act of 1966 (NHPA) as well as those of the State of Hawaii, Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD).

Methodology

Archaeological Consultants of the Pacific conducted archaeological investigations in June, July and October, 2001. Fieldwork methods consisted of both surface and subsurface investigations. A Cultural Monitor from Nanakuli accompanied the field crew during the subsurface (trenching) investigations.

Investigations took the form of a 100% pedestrian (surface) survey of the subject properties and the excavation of thirty-six backhoe trenches. The purpose of the pedestrian survey was to identify all potentially significant historic and cultural sites that may be located on the surface of the subject property. This was done by having the field crew sweep the subject properties on foot following transects spaced approximately 5 to 10 meters apart. Transects ran along the path of the project roadway corridors. Visibility was good with sparse, knee to waist high grasses covering the terrain. Through the use of this procedure, a 100% surface survey of the subject properties was completed and potentially significant historic and cultural properties were identified.

Subsurface investigations were conducted within the Kaulawaha Road Improvement corridor and the Nanakuli Makai roadway corridor between Nanakuli Avenue and Pohakunui Avenue. An area of potential effect (APE) of 40 feet (12.2 m) on either side of the road centerline was established for these corridors. Trenching consisted of two backhoe trenches within the Kaulawaha Road corridor spaced 30 meters apart, and a series of thirty-four backhoe trenches within the Nanakuli roadway corridor generally spaced 50 meters apart. The trenches generally ranged from 2 to 4 meters (6 to 12 feet) in length and had a maximum depth of 100 to 180 centimeters (3.3 – 5.9 feet) below the surface. Representative profiles of the trenches and a detailed listing of the findings for each trench may be found in the full report in Appendix B. The purpose of conducting subsurface excavations was to determine if cultural deposits were present and to examine the soil stratigraphy. The results of these investigations could be used to evaluate the identified sites and to help determine their placement on the National and State Registers of Historic Places.

A variety of data analysis techniques and laboratory analyses were conducted according to standard scientific and archaeological methods and were recorded on standardized analysis forms. Descriptions of soils were made according to United States Department of Agriculture standards of composition and color. The report (Appendix B) provides complete descriptions of the investigation including written accounts, placement of features and trenches on plans drawn to scale, and profiles depicting stratigraphic deposits encountered. The methods utilized aided in developing a determination of site significance, as well as estimating the potential impact of future construction activities.

Findings and Evaluation of Site Significance

The investigations identified two sites of historic or cultural significance within the proposed Kaulawaha Road extension corridor between Makaha Valley Road and Mahinaau Road in the Kamaile area of the Waianae sub-district. These two sites, 50-80-07-5949 and 50-80-07-5950 (Figure 3-1), are referred to in this document as Sites 5949 and 5950.

Nanakuli Backhoe Trenches

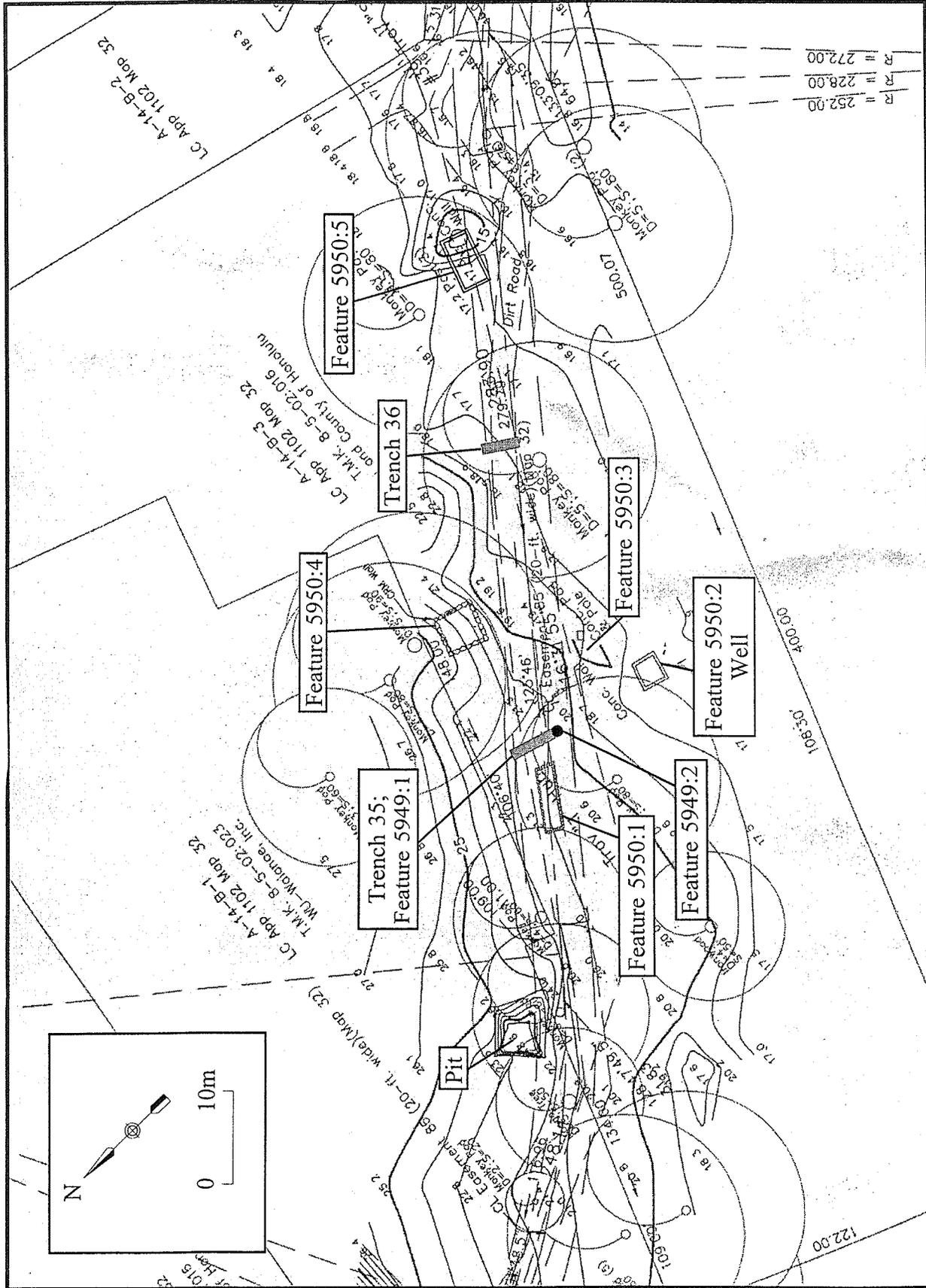
Trenching in Nanakuli was conducted for the original roadway alignment, which ran makai of Farrington Highway and the Oahu Railway and Land Company (OR&L) railroad tracks from Pohakunui Avenue to Lualualei Naval Road. From these excavations, a significant amount of previous disturbance was observed along the subject corridor in that area. Twenty-one (21) out of the thirty-four (34) trenches were entirely comprised of fill soils, while the remaining trenches contained at least some or nearly all fill soils. The fill is likely related to a deeply buried sewer line that runs much of the length of the proposed Nanakuli Avenue to Pohakunui Avenue corridor.

The native soil consisted of sand, loamy sand and sandy loam. No cultural materials were observed in these sandy soils. No historical or cultural sites were identified in any of the trenches along the proposed Nanakuli Avenue to Pohakunui Avenue corridor, aside from Site 9714 – the OR&L Railroad tracks, which is listed in the National Register of Historic Places (NRHP) (Figure 7 of Appendix B).

Helelua Place Extension

No archaeological sites were identified on the Helelua Place Extension corridor. However, three sinkhole openings were identified in the general vicinity of the project boundaries (see Appendix B). Sinkholes are naturally occurring features formed when the downward percolation of water erodes underlying limestone and coral rock. Humans may modify these sinkholes to accommodate particular uses such as temporary shelters, agricultural plots, and interment of human remains. None of the three sinkholes had any modifications around their openings. Additionally, they are located outside of the project boundaries and were therefore not explored or subject to testing.

FIGURE 3 - 1 Historic Sites 5949 and 5950, Waianae Subdistrict



Waianae Coast Emergency Access Road

source: Gray, Hong, Bills, Nojima & Associates Inc. 2001

Waianae (Kamaile) Backhoe Trenches

The two trenches (Trenches 35 and 36) excavated at the Kaulawaha roadway corridor in Kamaile revealed important information pertaining to the use of this area over time. Trench 35 was excavated within the existing dirt trail that follows the project route. The presence of traditional features beneath this existing dirt trail/roadway implies that this path was either established in connection with the sugar plantation camp or with the nearby pumping station. Deposits relating to traditional Hawaiian use of the area (Site 5949) along with disturbances relating to the historic use of the property (Site 5950) were identified and are discussed below.

Trench 36 was comprised almost entirely of fill soils. The native soil at the base of the trench consisted of clay. From this trench it is apparent that this area has been subjected to a substantial amount of earth-moving disturbance.

Site 5949

Site 5949 was identified during the excavation of Trench 35 and consists of disturbed subsurface deposits containing two features: 5949:1, a traditional permanent habitation (likely pre-Contact to early-Contact era) and 5949:2, a human burial. This site is considered to be associated with the previously documented Waianae (Kamaile) Complex (Site 1181, placed on the NHRP in 1972. This complex includes Kamaile Heiau (Site 161), Kukaaauau Cave, (Site 1185), a cluster of stone platforms and a C-shaped enclosure (Site 1190) which have been previously documented (Hommon 1978) and are listed on the NRHP.

Feature 5949:1 revealed the presence of what appears to be a buried stone platform or pavement. Historic materials such as ceramics, tile, and metal were present but not collected. Given the presence of midden material in the soil, Feature 5949: 1 is presumed to have been a habitation feature, rather than a burial feature, and may be dated at any time from relatively early in the pre-Contact period to the mid-eighteen hundreds. Subsurface portions of this site likely continue along and outside the Kaulawaha roadway corridor, as well as beyond the project corridor boundaries. From the research on the historic background of Kamaile, it appears that this traditional deposit is that of the Hawaiian village once located there. No standing traditional features were identified on the ground surface within the Kaulawaha roadway corridor.

Feature 5949:2 consists of human osteological remains of one individual encountered near the edge of the stone paving (Feature 5949:1) at the south end of Trench 35. The burial was observed to have suffered prior disturbance, as the remains were previously fractured and were scattered, including some only a few centimeters below the ground surface. No distinct pit could be observed around the remains.

Due to the substantial amount of disturbance, both prior and present, the *in situ* remains were not further excavated. All loose osteological material was retrieved from the backdirt, placed in a paper bag and reinterred at the base of the trench below the *in situ* remains. Materials including shell and animal bone were also present in the trench but were not collected. No further excavations were conducted in this area

due to the presence of the human remains near the stone pavement/platform. Therefore, the horizontal extent of Feature 5949:1 was not determined. Staff from the DLNR-SHPD visited the site and treatment of the burial was conducted following the direction of the DLNR-SHPD and the Oahu Burials Program.

Stone terraces and enclosures were present on the hillside of Kamaileunu Ridge just above and outside of the Kaulawaha roadway corridor, some of which are post-Contact (containing concrete sluices), though most of which are of indeterminate age. Some of these may be traditional features that were modified during the post-Contact era.

Kukaauau Cave (Site 1185) and Kamaile Heiau (Site 161) were visited as part of the Waianae (Kamaile) Complex investigations, of which Site 5949 is included. Midden was noted on the ground surface of the cave, and a few small pits were observed in the back of cave, likely from looters. The heiau was in good condition with coral still present in some places on the surface, and with internal enclosures still visible.

Site 5949 qualifies for consideration as significant under Criterion D (site has yielded, or is likely to yield, information important in prehistory or history) of the National Register of Historic Places criteria, and Criterion E (site has cultural significance) of the Hawaii Register of Historic Places criteria (refer to Table 3-1).

Site 5950

Site 5950 is located in the Kaulawaha corridor in Kamaile. It consists of a portion of a sugar plantation camp associated with the Waianae Plantation (ca. late 1800s to early 1900s), as well as features relating to the plantation water pumping station. Several concrete and mortared basalt foundations and a mortared basalt well were identified within the roadway corridor and are likely those already noted by previous archaeological studies. The site continues beyond the proposed roadway corridor. Portions of Sites 5949 and 5950 that lie outside the subject property were not addressed during the current investigations.

The well (Feature 5950:2) is likely one of the wells constructed by the Waianae Plantation. A large pit was present along the project roadway corridor, which may have been a failed attempt at tapping artesian waters. Feature 5950:4 may be the original water pumping station. Materials indicative of historic habitation, such as ceramics, bottle glass and metal were present on the ground surface and within Trench 35. Only two items were collected, including an old (perhaps early form of rubber) washer, and a piece of willowware ceramic.

Site 5950 qualifies for consideration as significant under Criterion A (site associated with events contributing to broad patterns in history) and D (site has yielded, or is likely to yield, information important in prehistory or history) of the National Register of Historic Places criteria (see Table 3-1).

Table 3-1: Summary of Archaeological Site Significance Evaluations

Site	Description	Function	Significance Evaluation
1181 (5949)	Subsurface traditional deposit containing a stone platform/pavement and a burial.	B and H	D and E
5950	Waianae Plantation Camp and pumping station structures.	Ag and H	A and D

Functional Interpretations

- Ag: Agriculture
 B: Burial
 H: Habitation

Code for Significance Evaluation Criteria

- A: Site is associated with events that have made a significant contribution to the broad patterns of history.
 B: Site is associated with the lives of persons significant in the past.
 C: Site embodies the distinctive characteristics of a type, period, or method of construction; or is the work of a master; or possesses high artistic values; or represents a significant and distinguishable entity.
 D: Site has yielded or is likely to yield information important in prehistory or history.
 E: Site has Cultural Significance (heiau, shrine, burial, etc.).
 NS: Not Significant.
 NLS: No Longer Significant.

Criteria A-D represent National Register of Historic Places criteria.
 Criterion E presents Hawaii Register of Historic Places criterion.
 NS and NLS represent designations acceptable to the DLNR-SHPD.

Recommendations

Pohakunui Avenue to Nanakuli Avenue Connector Roadway Corridor

Archaeological Consultants of the Pacific, Inc. (ACPI) concluded that construction activities along the proposed Nanakuli Makai connector roadway will have an indirect impact on the OR&L Railroad (Site 9714) because of their immediate adjacency to one another. Therefore, ACPI recommends that a determination be made that future construction activities would have an “adverse effect” on significant historic property at Site 9714, and care should be taken to avoid this site. This portion of the WCEAR will be makai of the railroad and will not encroach on to the OR&L ROW. Construction activities including stockpiling will also not occur on the railroad tracks or within the track ROW.

Impact on the OR&L Railroad will occur only at one place where there is already a designated crossing. These crossings are standard and are necessarily associated with all railroads. Construction and operation of this segment of the WCEAR should not interfere with plans to reopen the tracks and resume train operations. Additionally, the Hawaiian Railway Society has offered recommendations to minimize impacts to the railroad. Coordination with the Hawaiian Railway Society and the DLNR-SHPD will continue through the duration of the project.

Helelua Place Extension Corridor

The three sinkholes identified during the investigation are outside of the project corridor and therefore, are not expected to be impacted. However, there is the possibility that additional sinkholes are present below the fill deposit on the property. Additional sinkholes discovered during construction should be treated as inadvertent finds and inspected by an archaeologist. Appropriate action will be taken based on the presence or absence of cultural materials. No further archaeological investigations are recommended.

Kaulawaha Road Extension Connector Roadway Corridor

Archaeological Consultants of the Pacific, Inc. advises that future construction activities would have an “adverse effect” on significant historic properties at Site 1181 (5949) under the Advisory Council Regulations, 36 CFR 800. Data Recovery and a Burial Treatment Plan are recommended for Site 1181 (5949). Staff from the DLNR-SHPD were contacted immediately following the discovery of the burial (Site 5949:2). Subsequent treatment of the site, including stopping further excavations and reinterment of the osteological remains, have been under the direction of the DLNR-SHPD and the DLNR’s Oahu Burials Program. Additionally, members of the local community have been contacted and discussions are ongoing to ensure proper handling of the remains.

The DLNR-SHPD has also indicated that the Kaulawaha Road area may have additional archaeological features. Every effort will be made to avoid and/or minimally impact any identified and potentially identified sites. If this segment is not feasible due to archaeological constraints, the City holds the option of using Mahinaau Road as an alternate route through this area. However, Mahinaau Road is not the preferred alignment due to potential impacts on the residents of that street. Maps of any new alignments

will be submitted to the DLNR-SHPD for review. Additional subsurface testing may be required. A trained archaeologist will be retained for additional work in this section.

Paakea Road Extension, Pakeke Street to Hakimo Road Connector Corridors and Mahinaau Road Extension to Plantation Road/Ala Hema Street

No sites were identified within the three other connector roadway corridors.

Overall Route

The community has suggested that a cultural monitor may assist in the final determination of road alignments to lay out the route that is least likely to encounter archaeological sites. A qualified archaeologist will also be retained for any additional survey work as needed and to monitor construction activities in the Kaulawaha Road and Nanakuli Makai sections, as recommended by the DLNR-SHPD.

3.3 CLIMATE AND GEOGRAPHY

Existing Conditions

The Waianae Coast Emergency Access Road (WCEAR) project area is located along the Leeward Coast of Oahu. A background report developed by Townscape, Inc. for the *Waianae Sustainable Communities Plan*, in July of 1999 generally identified the coastal areas of the district as semiarid. The climate becomes cooler and wetter in the upper sections of the valleys and into the Waianae Mountains. Average annual rainfall ranges from less than 20 inches per year along the coast, to 30 inches along the upper parts of the valley, to 40 inches on the lower slopes of the Waianae Mountains, to more than 80 inches near the summit of Mount Kaala. Mount Kaala is the highest peak on Oahu at 4,025 feet, and is visible from much of the Waianae coast. Most of the year's precipitation occurs during a few major storms, predominantly during the winter months.

The prevailing wind pattern results from northeasterly trades. Coastal low temperatures range from 62°F in the winter to 70°F in the summer. The average high temperatures range from 80°F in the winter to 88°F in the summer. The higher elevations experience lower average temperatures.

Anticipated Impacts and Mitigative Measures

The project is not expected to impact climate and geography, therefore no mitigative measures are proposed.

3.4 CULTURAL RESOURCES

In compliance with Act 50, which was passed by the 20th Hawaii State Legislature and signed into law in April of 2000, a cultural practices assessment of portions of the Waianae District that may be impacted by

the Waianae Coast Emergency Access Road project was conducted by Cultural Surveys Hawaii. The full document, A Traditional and Cultural Practices Assessment for Portions of the Proposed Waianae Coast Emergency Access Road at Nanakuli, Lualualei, Maili, Waianae and Makaha, Waianae District, Island of Oahu, may be found in Appendix C of this Environmental Assessment.

Historical documents and maps were researched to obtain background information on the project area. Approximately 100 Hawaiian organizations, agencies and community members were contacted to identify knowledgeable individuals “with cultural expertise and/or knowledge of the project area and the surrounding vicinity” and to discuss cultural concerns regarding the proposed project. This research and interview process was conducted between June and August of 2001 and was supplemented by additional fieldwork in the Helelua Place to Lualualei Naval Road area in October of 2001.

Existing Conditions

Burials

The community’s greatest concern was over burials. In particular, the Nanakuli Makai segment between Pohakunui Avenue and Nanakuli Avenue was of the greatest concern due to the presence of sand dunes, which are known to contain burials and cultural materials. Previous experiences with *iwi* (bones) becoming uncovered in the areas makai of Farrington Highway also triggered concerns. Of additional concern was the Kamaile area where Kaulawaha Road is proposed for extension to Plantation Road in the Waianae subdistrict. Consultation on this area suggested the potential for burials due to the presence of sinkholes, which were commonly used for such purposes.

Other Archaeological Concerns

There was some concern that the new WCEAR roadway segments would allow increased accessibility to archaeological sites, especially in the Paakea Road, Hakimo Road to Pakeke Road and Kaulawaha Road extension areas. Increased accessibility into those areas may tempt drivers to stop and look for archaeological or cultural artifacts.

Religious Sites

Some concern was raised over the Kane i ka Pualena heiau, which by some accounts was located at the base of Puu Kamaile (also known as Puu Kamaileunu) in the Waianae subdistrict. The original stones from the heiau are no longer present, but the foundation may still be present and used in the future for possible reconstruction. The original roadway alignment would run through the edge of the puu.

Hawaiian Trails

Several consultations resulted in references to a night marcher trail in the vicinity of Mahinaau Road in the Waianae subdistrict. Night marchers are believed to be the souls of those who have passed on. Those souls continue to travel and play in the general vicinity of areas they frequented when they had physical bodies. Night marcher paths usually travel from mauka to makai after sunset and from makai to mauka before dawn breaks. No exact location could be determined for the Mahinaau night marcher path.

A modern foot trail exists in the vacant lots where the proposed Helelua Place to Lualualei Naval Road connector roadway would be constructed. The trail runs from the Puu Haleakala residential community to the remnants of the Nakatani Housing that was located on the northwest corner of parcel 77 behind the Pacific Shopping Mall. The trail is used as a short-cut between homes and the Sack-n-Save market and the bus stop on Farrington Highway.

Historic Sites

The OR&L Railroad is listed on both the National and State Register of Historic Places. The railroad ROW is the longest stretch of continuous railroad track in Hawaii and one of the longest stretches of narrow-gauge track in the United States. The Nanakuli to Honouliuli ROW is also the longest remaining continuous stretch of the historic OR&L narrow gauge railroad. Community members and the Hawaiian Railway Society expressed some concern regarding both proper construction around the railroad and the current Leeward Bikeway project within the OR&L Railroad easement.

Other Concerns

Other concerns that might not be considered specifically under the heading of “cultural resources” were also recorded. These included concern over the loss of space by Nanaikapono Elementary School if the school fenceline were moved 40 feet makai of its current location. Also, the stretch of Farrington Highway between Haleakala Avenue and Auyong Homestead Road was recognized as being prone to flooding. This was a concern because the current alignment of the WCEAR does not have an alternate alignment to Farrington Highway for a portion of this area. Additionally, there was concern that unexploded ordnance from World War II may be found makai of Farrington Highway. This is a possibility due to the heavy military use of Nanakuli during that war. Unexploded ordnance was previously found makai of the OR&L Railroad tracks.

Anticipated Impacts and Mitigative Measures

Burials

Archaeological assessments of the proposed roadway corridors were conducted to determine the presence of burials and other archaeological features. A summary of the findings may be found in Section 3.2 and the full archaeological report may be found in Appendix B. One human burial was discovered in the Kamaile complex in the Kaulawaha Road extension corridor in the Waianae subdistrict. To avoid disturbing this burial, the roadway alignment has been moved makai. The Oahu Burial Council, the Department of Land and Natural Resources State Historic Preservation Division (DLNR-SHPD) and members of the local community have been contacted regarding this burial. Further steps regarding reinterment procedures and protocols will be guided by these two entities as well as by consultation with the local community. A cultural monitor was recommended during any physical work done on the Nanakuli makai and Kaulawaha Road (Kamaile) sites and was present during archaeological fieldwork. A qualified archaeologist and a cultural monitor will also be present during the construction phase of the project. Should other burials be discovered during construction, work will immediately stop and the DLNR-SHPD will be notified.

Other Archaeological Concerns

Community consultations resulted in recommendations that the Kaulawaha Road extension, the Paakea Road extension and the Pakeke Road to Hakimo Road connector be closed and locked when the WCEAR is inactive. This would reduce the likelihood of motorists stopping and exploring for archeological sites in these areas. The Hakimo Road to Pakeke Road connector is already planned as a roadway that would only be open during emergency situations on Farrington Highway. The community participation process discussed in Section 2.1 resulted in a consensus that the Paakea Road and Kaulawaha Road extensions be permanently open to the public. Permanently accessible roadways would allow convenient travelways for local residents, especially those commuting between the Makaha Valley Road to Mahinaau Road area and Kamaile Elementary School. However, subsequent community input revealed that opinions are split on whether the Kaulawaha Road improvements should be permanently open or only available for “emergency use.” Therefore, both options are still being considered.

Religious Sites

While there are no known associated cultural practices identified with Puu Kamaile, it is still a sensitive issue to some community members whose family oral traditions locate the Kane I ka Pualena heiau at its base. The archaeological fieldwork for the project suggested realigning a portion of the Kaulawaha Road Extension in order to avoid excavating the hillside of the puu. This section of roadway has subsequently been moved in the makai direction to avoid the puu. The proposed alignment shown on Sheet 23 in Appendix A identifies the section where realignment is proposed.

Hawaiian Trails

A night marcher trail is reported to go through Mahinaau Road in the Waianae subdistrict. Despite several references to the night marcher’s trail, no one could provide specific details on the trail or identify its exact path. Mahinaau Road is currently not the preferred alternative for that section. The preferred alignment is the extension of Kaulawaha Road, from Makaha Valley Road to the Mahinaau Road – Kaulawaha Road intersection. However, Mahinaau Road is still being explored as an alternate alignment should additional burials or other archaeological features render the Kaulawaha extension infeasible. In this event, recommendations were made to bless the Mahinaau segment to cleanse the path and to not cause injury to those traveling there.

A foot trail exists between the Puu Haleakala residential community and the Sack-n-Save market in Nanakuli, on the lots where the Helelua Place to Lualualei Naval Road connector roadway is proposed. The trail is used by current residents as a shortcut to the market and the bus stop on Farrington Highway. The proposed roadway segment will be open to vehicular traffic only during emergencies and will be locked at all other times.

Historic Sites

The OR&L Railroad is a listed site on both the Federal and State Register of Historic Places. The Hawaiian Railway Society made several recommendations concerning the railroad: designated crossing

points to ensure proper track alignment, no stockpiling or construction related activities on the tracks, no encroachment into the 40-foot ROW and coordination with the Hawaiian Railway Society and the DLNR-SHPD. The WCEAR segment connecting Nanakuli Avenue with Pohakunui Avenue makai of Farrington Highway in Nanakuli will be designed to fit outside of the Railroad ROW. Therefore, there will be no encroachment. Construction activities including stockpiling will not occur on the railroad tracks and crossing points will be designated for construction equipment as well as for vehicles using the finished WCEAR segment. Coordination with the Hawaiian Railway Society and the DLNR-SHPD will continue through the duration of the project.

Other Concerns

The original WCEAR Nanakuli subdistrict alignment would have required relocating the Nanaikapono Elementary School fenceline 40 feet makai of its current position. To avoid this and other impacts, the makai section was terminated at Nanakuli Avenue and rerouted mauka of Farrington Highway. Therefore, the Nanaikapono School fence will remain intact.

The stretch of Farrington Highway between Haleakala Avenue and Auyong Homestead Road is prone to flooding. The current WCEAR does not have an alternate alignment to Farrington Highway for the portion of this area between Helelua Street and Haleakala Avenue. Various options were considered for this area, including a route makai of Farrington Highway and one mauka but physical constraints and social impacts eliminated those options. Therefore, should an event such as flooding make the section of Farrington Highway between Haleakala Avenue and Helelua Street impassable, there is no feasible bypass route. Similarly, the WCEAR would not provide an alternate route if a major car accident between Haleakala Avenue and Helelua Street blocked traffic flow. However, should a large scale disruption of Farrington Highway occur, the WCEAR project would allow emergency crews to concentrate on clearing and/or repairing a relatively short portion of Highway in Nanakuli while traffic is rerouted using the WCEAR in the Lualualei/Maili, Waianae and Makaha Sub-districts.

There was concern that unexploded ordnance from World War II may be found makai of Farrington Highway. Construction work makai of Farrington Highway has been drastically reduced since original plans outlined a route from Pohakunui Avenue to Lualualei Naval Road. Now, construction will only occur between Pohakunui Avenue and Nanakuli Avenue. There is still some potential for discovering ordnance since construction will occur in sandy areas near the shoreline, although this is unlikely since the trenching performed during the archaeological survey indicated a large amount of fill material and found no ordnance. Construction crews will be alerted to this possibility and the necessary precautions will be taken.

3.5 FAUNA

Existing bird and mammal resources within the project area are documented in the Avifaunal and Feral Mammal Field Survey for the Proposed Waianae Coast Emergency Access Road, Oahu (Phil Bruner,

Environmental Consultant, October 2001), which is included in Appendix D. The findings are summarized below.

Existing Conditions

The survey was conducted over several days in late June, early August and October of 2001. The entire proposed route was covered by driving the existing roads and walking the areas not accessible by vehicle.

The avifaunal survey within the proposed connector roadway corridors identified a Black-Crowned Night Heron (*Nycticorax nycticorax*), the only native waterbird identified, along the shoreline in the Nanakuli Sub-District. This species is not endangered or threatened. Previous surveys in this region found little suitable habitat for waterbirds.

The only native land bird that might occur in the area is the Short-Eared Owl (*Asio flammeus sandwichensis*) or Pueo. This species is listed by the State of Hawaii as endangered on Oahu. None were recorded on this survey, but the species is known to occur in Nanakuli and Lualualei. No other native land birds would be expected in this area due to the absence of appropriate habitat for these species.

Migratory birds identified within the project area include the Pacific Golden Plover (*Pluvialis fulva*), the Wandering Tattler (*Heteroscelus incanus*), and the Ruddy Turnstone (*Arenaria interpres*). None of these species are listed as endangered. Eighteen non-native introduced bird species were recorded during the survey and are listed in Appendix D. The array of species encountered on the survey are those typically found in this region of the island.

Mammalian species identified during the survey included Indian mongoose (*Herpestes auro-punctatus*), roof rats (*Rattus rattus*) and domesticated cats and dogs. The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) is rare on Oahu and was not observed during this survey.

Anticipated Impacts and Mitigative Measures

The birds and mammals found in the proposed project area were those that typically occur in the Waianae District. No endangered species were observed, although the Short-eared Owl and the Hawaiian Hoary Bat might occasionally be seen in this region. The proposed project should have no impacts on these two species and will not likely affect the relative abundance of introduced birds in this region of Oahu. No mitigative measures are proposed.

3.6 FLORA

Existing botanical resources within the project area are documented in the Botanical Resources Assessment – Waianae Coast Emergency Access Road (WCEAR), Waianae District, Oahu (Winona P. Char, Char & Associates, October 2001), Appendix E. The findings are summarized below.

Existing Conditions

A reconnaissance site visit and two field studies were completed in June 2001. A supplemental field study was conducted in October 2001. The objective of the field studies was to provide a general description of the vegetation along the proposed new roadway corridors and to search for threatened and endangered species, as well as species of concern.

Much of the project area and proposed connector roadway corridors have been previously disturbed. These areas are dominated by introduced or alien species such as plumeria, mango, coconut, hibiscus and monkeypod, which are used for landscaping. Those areas that are not maintained or are undeveloped support kiawe and koa haole interspersed with buffel grass and Guinea grass. Undeveloped areas exhibit evidence of previous disturbance such as bulldozing, fires and dumping of trash or construction materials.

Four indigenous species, native to Hawaii and elsewhere, were identified in the project areas. These include the ilima (*Sida fallax*), uhaloa (*Waltheria indica*), hoary abutilon (*Abutilon incanum*), and kipukai (*Heliotropium curassavicum*). Ilima, uhaloa and hoary abutilon were found in previously disturbed areas of the Lualualei/Maili Subdistrict in the Pakeke Street to Hakimo Road connector area. These three plant types were also found in the Kaulawaha Road connector corridor in the Waianae/Makaha Sub-district. More specifically, these plants were found in the areas mauka of Ala Hema and Ala Akau Streets and Kamaile Elementary School. Kipukai, also known as nena, was found in the Nanakuli Subdistrict near the mauka boundary of Nanaikapono School.

Three endemic species, or species native to only the Hawaiian Islands, were also identified. A patch of kaunaoa (*Cuscuta sandwichiana*) was found in the Paakea Road extension area in the Lualualei/Maili Subdistrict. A few shrubs of the Hawaiian Cotton or mao (*Gossypium tomentosum*) were located in the area proposed for the Pakeke Street to Hakimo Road connector roadway. A single plant of the native caper, maiapilo (*Capparis sandwichiana*) was also observed in one of the parcels proposed for the Helelua Place to Lualualei Naval Road connector.

The U.S. Fish and Wildlife Service does not list or propose for listing any of the plants identified within the project connector roadway corridors as a threatened or endangered species. However, the Hawaiian Cotton (mao) and the caper (maiapilo) are considered species of concern, which means that more biological and/or taxonomic information is necessary to determine the future conservation requirements of the species. At present, both mao and maiapilo are considered low priority items by the U.S. Fish and Wildlife Service.

Anticipated Impacts and Mitigative Measures

The vegetation along the proposed roadway corridors where construction will occur is dominated by introduced or alien plant species. Undeveloped areas support kiawe forest and koa haole thickets with buffel and Guinea grass as the common ground cover. Existing dirt and coral-lined roads that cross private properties support weedy, mostly herbaceous species.

Most, if not all, of the undeveloped areas exhibit evidence of past disturbances including bulldozing, fires and dumping of trash or construction materials. The kipukai mauka of Nanaikapono School in Nanakuli would have required removal for the connector roadway between Pohakunui Avenue and Lualualei Naval Road. However, the current alignment will only extend to Nanakuli Avenue and will not pass mauka of Nanaikapono School. The kaunaoa patch would be impacted by the Paakea Road extension. Two or three mao shrubs may be disturbed by the proposed roadway corridor that would link Hakimo Road with Pakeke Street in the Lualualei/Maili Sub-district. No mitigation is required. However, efforts will be made to relocate the plants near their present locations. The proposed project will not impact listed or proposed endangered or threatened species. No mitigative measures are proposed.

3.7 LAND USES AND GENERAL LAND OWNERSHIP

Most of the existing development in the Waianae District is located near Farrington Highway. The valleys support primarily agricultural or military functions, but the steeper ridges and mountains are generally undeveloped grasslands and forest. Land uses and ownership for the areas surrounding the proposed new WCEAR roadway connectors include undeveloped private, City and County of Honolulu and State of Hawaii lots, private residential areas, Kamaile Elementary School, and Kalaniana'ole Beach Park. Section 2.2 identifies all affected landowners.

3.7.1 Relationship to Land Use Plans and Policies

The Honolulu County General Plan calls for protecting people and property from natural disasters and other emergencies by reducing hazardous traffic conditions, and developing civil defense plans and programs to protect and promote public health, safety and welfare.

The Waianae Sustainable Communities Plan calls for a long-range vision that is built on a process that is based on the community's cultural values and rural qualities. Additionally, the Plan states that "There is a need to establish an Emergency Road or Emergency Access/Egress route that can be used as an alternate to Farrington Highway for those times when one or more sections of Farrington Highway may be impassable due to storm damage, a severe vehicular accident, or some other cause. An emergency route may include sections of private roads, which would require special provisions for public use in times of emergency."

Anticipated Impacts and Mitigative Measures

The proposed project is consistent with and supports the General Plan objectives and policies pertaining to Transportation and Utilities and Public Safety as well as the Waianae Sustainable Communities Plan that recognizes the need to establish an emergency access route. The WCEAR project is also included in the City's six-year Capital Improvement Program budget, the Oahu Metropolitan Planning Organization's 2025 Oahu Regional Transportation Plan and the Waianae Public Infrastructure Map.

3.7.2 State Land Use Designations

Generally, the lands in the shoreline areas and around the puus (hills) of the WCEAR corridors are designated as State Conservation. The existing Farrington Highway corridor is designated as Urban, as well as the lower valley of Nanakuli and most of Makaha Valley. The mid to upper valleys are designated as Agriculture.

All of portions of Farrington Highway located within the project boundaries are included in the Special Management Area (SMA). Of the proposed new connector roadways, only the Nanakuli Makai corridor between Pohakunui Avenue and Nanakuli Avenue is located within the SMA (Figure 3-2).

Anticipated Impacts and Mitigative Measures

The project is not expected to impact state land use designations. An SMA permit will be required for the Nanakuli Makai connector roadway. All required approvals and permits will be acquired when necessary.

3.7.3 City and County of Honolulu Land Use Zoning

In general, the City and County of Honolulu's zoning designation for the land makai of Farrington Highway is P-2, General Preservation. The exceptions are the Department of Hawaiian Home Land's Nanaikapono Subdivision in Nanakuli, which is zoned R-5 Residential, and the Waianae Kai Military Reservation Beach (U.S. Army), which is zoned F-1, Military and Federal. Those areas directly mauka of Farrington Highway are zoned either R-5 or R-20, Residential; B-1 Neighborhood Business; or A-1 or A-2, Apartment. Areas further mauka are designated P-1, Restricted Preservation; P-2, General Preservation; Ag-1 or AG-2, Restricted Agriculture; C, Country; F-1, Military and Federal where the Lualualei Naval Communications Facility is located; and Resort, where the Makaha Valley Country Club and the Sheraton Makaha Resort West Golf Club is located.

Zoning designations for the four connector roadway corridors are listed below. The final zoning designations for each connector roadway corridor will need to be verified when the final design and surveyed roadway lots delineations have been completed:

Pohakunui Avenue to Nanakuli Avenue

R-5	Residential
P-2	General Preservation

Helelua Place to Lualualei Naval Road

C	Country
R-5	Residential

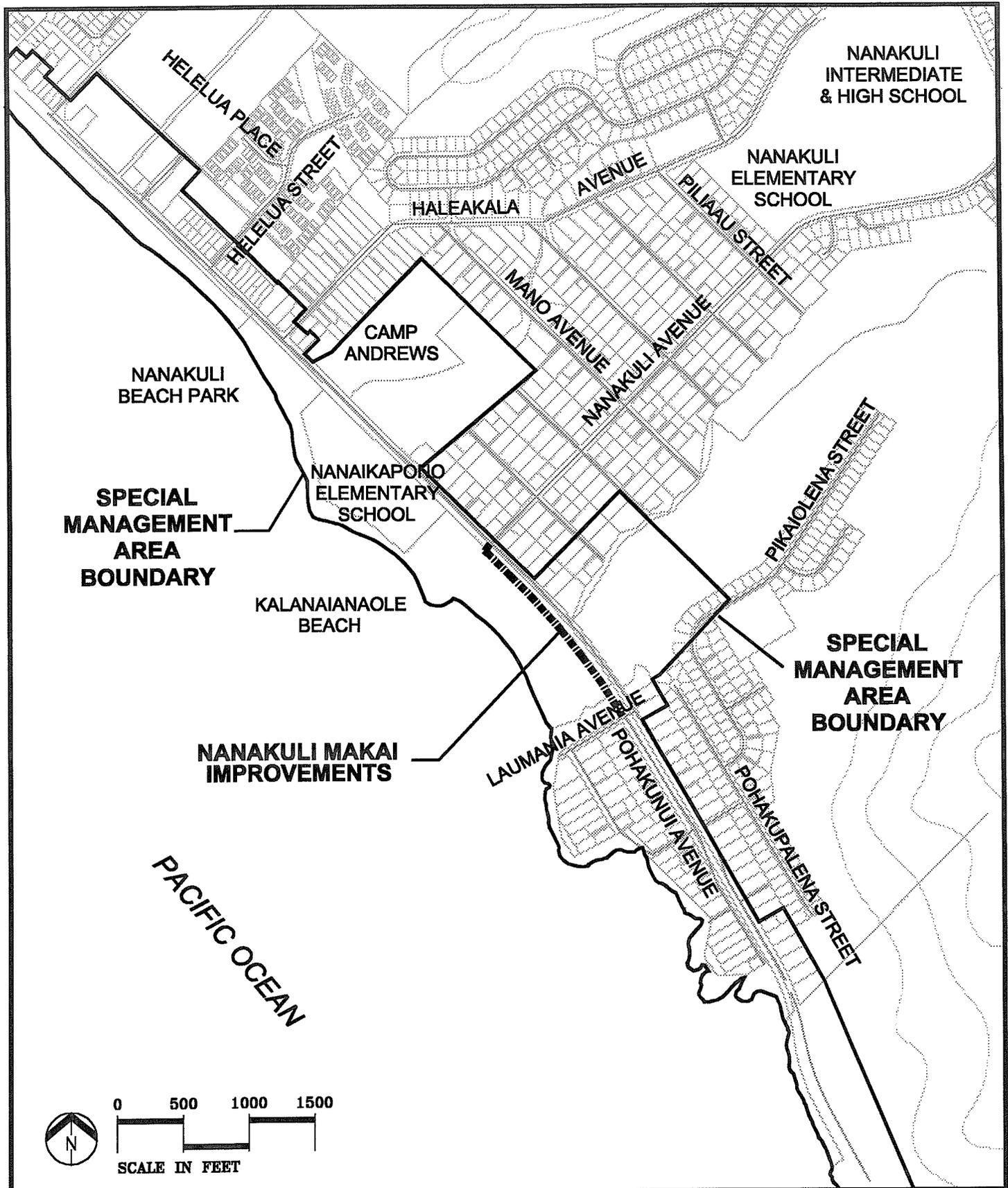


FIGURE 3 - 2
WAIANAE COAST EMERGENCY ACCESS ROAD
SPECIAL MANAGEMENT AREA BOUNDARIES
Nanakuli Makai Section

TOWNSCAPE, INC.
 Environmental and Community Planning
 900 Fort Street Mall
 Suite 1160
 Honolulu, HI 96813

Paakea Street Extension to Lualualei Naval Road; portions of zoning designations:

AG-1	Restricted Agricultural
I-2	Intensive Industrial
AG-2	General Agricultural

Hakimo Road to Pakeke Street; portions of zoning designations:

R-5	Residential
AG-2	General Agricultural

Mahinaau Road Extension between Kaulawaha Road and Ala Hema Street/Plantation Road:

AG-2	General Agricultural
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Kaulawaha Road Extension between Mahinaau Road and Makaha Valley Road:

AG-2	General Agricultural
C	Country

Anticipated Impacts and Mitigative Measures

The Nanakuli connector roadway between Pohakunui Avenue and Nanakuli Avenue is the only proposed road that is within the Special Management Area. A Special Management Area Permit will be obtained when necessary. A Conservation District Use Permit will also be required for the Kaulawaha Road Improvements.

Agricultural Roadway Standards will be used to design the new connector roadway improvements. These standards are allowed within the zoning designations for the three roadways that may potentially provide permanent public access. The roadways proposed for “Emergency Use Only” do have portions in areas zoned other than agriculture, such as R-5 (residential). However, their infrequent use only during “emergencies” does not warrant further improvement beyond that proposed for the Agricultural Roadway Standards.

3.7.4 Overall Leeward Coast Land Ownership and Use

This section describes general land ownership and use throughout the Leeward Coast. Existing road ownership is addressed in the following section, 3.7.4.

There are four major landowners in the Waianae District who together own approximately 28,000 acres or 73% of the district’s land area. These landowners include the State of Hawaii (12,000 acres), the United States Navy (8,500 acres), the City and County of Honolulu (4,498 acres) and the Department of Hawaiian Home Lands (2,880 acres). An additional 4,177 acres, or 11% of the district is owned by approximately 20 landowners, whose properties are between 720 and 54 acres each. The remaining 6,000+ acres consist of less than 50-acre plots, most of which are dedicated to either small farms or residential uses. The following is a description of land uses by sub-district is below:

Nanakuli Sub-district. There are approximately 2,000 homes on Hawaiian Home Lands in the Nanakuli Community. In addition to the Hawaiian Home Lands residential communities, the areas surrounding the WCEAR construction corridors in Nanakuli include various small businesses, Puu Haleakala residential community, Camp Andrews, Piliokahe Beach, Nanakuli Beach Park, Kalaniana'ole Beach Park, Nanaikapono Beach Park, and Nanaikapono Elementary School.

Lualualei/Maili Sub-district. Most of the land uses in this sub-district consist of small residential lots on the mauka side of Farrington Highway, constructed generally in the 1960's and 1970's. In Maili there are a few small commercial establishments, the Navy's Communications Facility at NCTAMS EASTPAC RTF Lualualei, and several beach parks including the Maili Kai Community Park, Ulehawa Beach Park, Maipalaoa Beach Park, Maili Beach Park, and Mailiilii Beach.

Waianae Sub-district. Most of the development in the Waianae sub-district occurs along Farrington Highway, especially on the mauka side. There is some commercial and residential activity on the makai side of Farrington Highway in the Waianae Town Center and Pokai Bay. Surrounding land uses include the Lualualei Reservoir, Leihoku Elementary School, the Waianae Community Center, Pililaa Field, Waianae Elementary School, Waianae public housing, Waianae Intermediate School, the Waianae Civic Service Center, the Waianae baseyard, Waianae District Park, the Waianae Regional Recreation Center, Waianae Park, Waianae High School, the Waianae Boat Harbor, the Waianae-Kai Military Reservation, Pokai Bay Beach Park, Pokai Bay Boat Harbor, and Lualualei Beach Park.

Makaha Sub-district. The Makaha sub-district has residential lots along Farrington Highway and larger farm lots in the lower valley area. The middle of the valley contains the Makaha Valley Country Club and the Makaha Resort West Golf Club, the Makaha Valley Towers condominiums, and the Makaha Valley Plantation Townhouses. Land uses closer to the coast include the Makaha Surfside condominiums, Mauna Lahilahi Beach Park Mauna Lahilahi Botanical Gardens, Cornet Village, the Hawaiian Princess Makaha Beach Condominiums, the Makaha Beach Cabanas, Makaha Elementary School, Makaha Community Park, the Makaha Village Condominiums, and Makaha Beach Park.

Anticipated Impacts and Mitigative Measures

Construction of the Nanakuli Makai roadway connector will require a 40-foot easement makai of the OR&L Railroad tracks (See Sheet 3 of Appendix A). This will result in a loss of property by Kalaniana'ole Beach Park. Portions of the Beach Park may be fenced off during construction for safety reasons, although most of the park will be available via other access points. The Nanakuli Makai segment is designated as "Emergency Use Only" and will only be open to vehicular access when an incident on Farrington Highway disrupts traffic in this area. Impacts will therefore be limited to only those times. Park access will still be available when this road segment is activated, although traffic through this end of the park will increase. The Police Department, the agency responsible for redirecting traffic, is represented on a team of City Agencies that are working together to develop an Operational Plan for the smooth movement of traffic around emergency situations.

The Helelua Place to Lualualei Naval Road connector roadway in Nanakuli will require a 44-foot ROW. This will require easements or a right-of-way from portions of TMK parcels 8-7-08:76; 8-7-08:77; and 8-7-37:45 (Sheet 5 of Appendix A).

The Paakea Road Improvements in Lualualei/Maili will require a 40-foot ROW and will affect the 4 property owners of TMK parcels 8-7-19:01, 06; 8-7-21: 35, 54, 01 (Sheet 8 of Appendix A).

The Pakeke Street/Hakimo Road Connector Roadway will require a 66-foot ROW. The three landowners of TMK parcels 8-7-10:02, 20 and 8-7-19:11 will be affected (Sheets 14 & 15 of Appendix A).

The Mahinaau Road Extension to Ala Hema Street/Plantation Road in the Waianae and Makaha Sub-districts will affect 4 adjacent landowners. Construction of the new roadway will require result in a loss of property to four TMK parcels including 8-5-2:022; 8-5-2:040; 8-5-3:030; and 8-5-3:036 (see Sheet 21 of Appendix A).

The Kaulawaha Road extension to Mahinaau Road in the Makaha Sub-district affects 13 adjacent landowners. Specific property maps have been prepared for this section of the WCEAR. (See Sheet 25 of Appendix A). Road right-of-way acquisition will be required for portions of TMK 8-4-19:001; 8-4-19:026; 8-5-02:016; 8-5-02:022; 8-5-02:023; 8-5-02:024; and 8-5-06:010.

If the Kaulawaha Road extension becomes infeasible due to the presence of archaeological or cultural sites and no realignment is possible, Mahinaau Road is proposed as an alternate route between Maiuu Road and the makai portion of Kaulawaha Road. If it becomes necessary to use Mahinaau Road, it would need to be improved to meet the Agricultural Road Standards presented in Section 2.2. There are 11 landowners that hold property adjacent to Mahinaau Road. The road improvements will not require the loss of private residential land to widen the road to meet the new standards (see Section 2.2).

The connector roadways may result in a loss of property for some adjacent landowners. The City is currently exploring options regarding the use of private property for the WCEAR. Either a roadway easement or a right-of-way is proposed for the new connector roads. The Department of Land and Natural Resources Land Division will be notified when an easement over State Land is required.

The development of an emergency bypass road system is not expected to have a significant impact on surrounding land uses or ownership. Road improvements have been known to increase resident populations within the serviced area. However, this WCEAR project primarily uses existing streets that would be identified as the bypass route. In addition to this, only the Paakea Road Extension is currently proposed for permanent public access. The two Nanakuli connector roadways and the new Hakimo Road to Pakeke Street connector would only be open for public use when an emergency situation closes Farrington Highway. The status of the Mahinaau Road Extension and the Kaulawaha Road Improvements will be determined in the final design stage.

3.7.5 Ownership of Existing Roads Proposed for Use in the WCEAR Operational Plan

Section 2.2 identified physical improvements required to implement the WCEAR. The City intends to acquire or purchase easements and to maintain all roadways proposed for improvement.

The operational plan routing (Section 2.3.1) identifies the existing roadways that are necessary to complete the WCEAR. All existing roadways are owned and maintained by the City with the following exceptions:

Nanakuli Sub-District: Owned and maintained by the Department of Hawaiian Home Lands

Nanakuli Avenue
Pohakunui Avenue
Haleakala Avenue
Mano Street

Lualualei/Maili Sub-District: Owned and maintained by the U. S. Navy. Landowners with access off of Lualualei Naval Road such as PVT and Kaiser Cement share in the cost of maintenance and have a use agreement with the Navy.

Lualualei Naval Road

Waianae Sub-District: Owned by Makaha Valley Inc. (Capital Investments of Hawaii) and maintained by the City and County of Honolulu.

Plantation Road (portion)

Makaha Sub-District: Owned and maintained by Makaha Valley Inc. (Capital Investments of Hawaii).

Makaha Valley Road
Huipu Drive
Ala Holo Loop
Kili Drive
Lahaina Street
Water Street

Anticipated Impacts and Mitigative Measures

Implementation and use of the WCEAR roadway system will be intermittent and to the benefit of the Leeward Coast general population. All existing roads included in the WCEAR routing are capable of handling standard City bus traffic and therefore do not require upgrades. The only exception is Mahinaau Road. While Mahinaau Road is not the preferred the alignment, it is being evaluated as an alternative to the Kaulawaha Road Improvements in the event that archaeological concerns cannot be satisfactorily accommodated. Therefore, if the existing Mahinaau Road is used, it will require upgrades and widening to meet WCEAR road standards.

It was not originally anticipated that ownership of the existing private roadways would change as a result of implementing the WCEAR. However, both the U. S. Navy and Makaha Valley Inc. have expressed interest in turning over the affected sections of WCEAR roadway to the City in conjunction with adoption of the WCEAR plan. The City has already met preliminarily with the Navy regarding conveyance of Lualualei Naval Road. The issue is being studied.

3.7.6 Land Acquisition

The majority of the necessary land acquisition required includes existing roadway lots or easements. The roadway with the largest number of individual landowners is the last area subject to design and construction, and therefore allows for adequate time for discussions regarding transfer. Preliminary landowner discussions have already occurred and specific details will be discussed with each landowner in the final design stage. The property maps in Appendix A have been submitted to the Department of Design and Construction Land Division.

3.8 NATURAL HAZARDS

3.8.1 Flooding

Flood Zones. According to the Flood Insurance Rate Maps (FIRM) produced by the Federal Emergency Management Agency (FEMA), the entire Waianae Coast from Nanakuli to Makaha is subject to inundation by "100-Year Floods." The flood zones for each sub-district are as follows:

Nanakuli Sub-district: AE & VE, along the coast and parts of Farrington Highway; and D in some makai areas, but mostly mauka areas along Farrington Highway.

Lualualei/Maili Sub-district: X, along mauka portions of Lualualei Naval Road; AE, along Ulehawa Channel and coast and parts of Farrington Highway; VE, along coast); D, mauka of Farrington Highway to Paakea Road.

Waianae Sub-district: AE & VE, shoreline; D, makai of Farrington Highway, including parts of the Highway; X, along Kaulawaha Road.

Mahaka Sub-district: AE & VE, along coastline and along East Makaha Stream, West Makaha Stream, and Makaha Stream – lower part of Kili Street Farrington Highway and Coast; X, outside of AE and VE designation along East Makaha Stream.

Flood Zones:

- Zone AE 100-year flood, base flood elevations determined
- Zone VE Coastal flood with velocity hazard (wave action); base flood elevations determined, 100-year flood
- Zone X (Flood Area) Areas of 500-year flood; areas of 100-year flood with average depths of less than 1-foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood
- Zone X (Other) Areas determined to be outside the 500-year flood plain
- Zone D Areas in which flood hazards are undetermined

Coastal Flooding. Coastal flooding occurs in the lower areas of the Waianae District during winter storms and hurricanes. Flood prone areas extend from 100 feet to 1,000 feet from the coast and cross over to the mauka side of Farrington Highway in the vicinity of Ulehawa Channel, Maili Channel, Maililiii Channel, East Makaha Stream and Makaha Stream. Flooding from seasonal storms sometimes disrupts traffic flow on Farrington Highway. High surf may also deposit sand, rocks, and other debris onto the roadway.

Local Flooding. Local flooding occurs in the low-lying areas of the valleys during heavy rains. Natural flooding is intensified by land use practices that divert floodwaters out of natural drainageways. Areas that are prone to localized flooding include: Nanakuli Kai, Waianae Elementary School, Auyong Homestead Road, Hakimo Road, Lahaina Street and Makaha Valley near the Makaha Towers condominiums.

Anticipated Impacts and Mitigative Measures

The proposed project is not anticipated to increase flood hazards for the area. The construction of the East Makaha Stream Bridge and the reconstruction of the Ulehawa Stream and Nanakuli Stream bridges will accommodate FIRM flood elevations and City and County of Honolulu Drainage Standards. The Nanakuli Stream traffic-bearing bridge will be constructed 5-feet to 6-feet higher than the existing pedestrian bridge. The Ulehawa Stream Bridge will be reconstructed with a final bridge deck elevation 4-feet higher than existing conditions. The East Makaha Stream Bridge will require a bridge deck 5 feet to 6 feet above the existing grade. Additionally, the WCEAR may provide an alternate emergency route around flooded portions of Farrington Highway. No other mitigative measures are proposed.

3.8.2 Tsunamis

The “Tsunami Evacuation Oahu Maps” identify the tsunami evacuation zone up to 1,900 feet mauka of Farrington Highway. Therefore, all of Farrington Highway is potentially threatened by tsunamis.

Anticipated Impacts and Mitigative Measures

With the exception of the Nanakuli Makai segment, the WCEAR project will provide a mauka alternative to Farrington Highway. Therefore, should a tsunami close all or a portion of Farrington Highway, vehicles may still be able to move along at least a portion of the Waianae Coast. The Nanakuli Makai segment of the WCEAR is as vulnerable as Farrington Highway to tsunamis and may not provide an alternate path. However, alternate mauka routes in that area were previously determined infeasible due to physical constraints and existing land development. Despite this vulnerability in the Nanakuli section, the WCEAR as a whole allows emergency crews to concentrate on clearing any blockage in one area as opposed to the whole coast. If both Farrington Highway and the Nanakuli Makai roadway are impassable, Kolekole Pass should also be investigated as another emergency alternative into and out of Waianae. Kolekole Pass is currently under the jurisdiction of the US Navy.

3.8.3 Hurricanes

Hurricanes are tropical cyclones with sustained winds of at least 74 miles per hour. Although the likelihood of a hurricane passing through the state is low, the State Civil Defense Department still recommends preparedness. Also, waves from distant hurricanes and other storms may impact Oahu’s shores and disturb travel on low-lying coastal roads such as Farrington Highway.

Anticipated Impacts and Mitigative Measures

The WCEAR project may provide emergency access into and out of the Waianae Coast should waves deposit debris onto Farrington Highway. The only portion of the WCEAR that is makai of Farrington Highway is in the Pohakunui Avenue to Nanakuli Avenue segment. Therefore, should a hurricane impact all or a portion of Farrington Highway, vehicles may still be able to move along the Waianae Coast. However, the Nanakuli Makai segment may be impacted by a hurricane as much as, if not more than, Farrington Highway. Therefore, a hurricane may restrict movement into or out of Waianae regardless of the WCEAR segment unless access to Kolekole Pass can be obtained from the Navy. Despite this vulnerability in the Nanakuli section, the WCEAR as a whole allows emergency crews to concentrate on clearing any blockage in one area as opposed to the whole coast.

3.8.4 Earthquakes

The City & County Uniform Building Code of 1997 identifies the island of Oahu as Seismic Zone 2A. This means that it has a low potential for seismic activity.

Anticipated Impacts and Mitigative Measures

The proposed project would provide an alternate access route along the Waianae Coast should Farrington Highway be closed due to damage caused by an earthquake. Earthquake risk or the potential for earthquake-related damages is not expected to increase as a result of this project. Therefore, no mitigative measures are proposed.

3.9 NOISE

Major sources of noise along the project corridor include vehicular traffic from Farrington Highway and its feeder roads, and surf pounding the shoreline. Farrington Highway is the primary transportation corridor for motorists traveling into, out of and within the Waianae District. Therefore, traffic noise along this route is usually continuous.

Anticipated Impacts and Mitigative Measures

Short-term noise would be generated due to construction activities and equipment. A Department of Health Permit is required for activities where construction noise is expected to exceed maximum permissible noise levels. The requirements of the permit, such as start and curfew times and the use of mufflers on construction equipment, would be followed to minimize noise disturbances.

Residents and other land uses along the emergency bypass route system may experience periodic noise increases during those times when the WCEAR system is active. The two Nanakuli connector roadways and the Hakimo Road to Pakeke Street roadway corridor will be gated and locked except for emergency situations. The only road that is currently being proposed for permanent status is the Paakea Road Extension. The land adjacent to this roadway segment contains grasses and shrubs and does not contain noise sensitive receptors such as homes, schools or hospitals. The Nanakuli Makai Improvements, the Helelua Place Extension and the Pakeke Street to Hakimo Road Connector are all proposed as "Emergency Access Only." The status of the Mahinaau Road Extension and the Kaulawaha Road Improvements has not yet been decided. No additional mitigative measures are proposed.

3.10 PUBLIC SERVICES

Fire protection services to the project area are provided by both the Nanakuli Fire Station #28 and the Waianae Fire Station #26. Police protection is provided by District 8 - Waianae/Kapolei. The District 8 Police Substation in Waianae provides the base of operations for patrols on the Waianae Coast. Emergency Medical Services are provided by the Waianae Unit and are based at the Waianae Fire Station #26.

Anticipated Impacts and Mitigative Measures

The proposed project is not expected to negatively impact the services provided by the City and County of Honolulu's Fire, Police, and Emergency Services Departments. Most of the roads are pre-existing and are already serviced by these units. Also, all roads in the WCEAR would be subject to standard 12-foot travel lanes and 8 to 13-foot shoulders in each direction and would be constructed to meet the Agricultural Road Standard described in Section 2.2. The WCEAR project should improve emergency access along the Waianae Coast in the event Farrington Highway is impassable, by providing an alternate route for emergency vehicles to bypass roadway blockages.

As recommended through consultation with the Fire Department (HFD), the new roadways will be constructed to comply with Department of Transportation Services standards related to fire apparatus. The HFD recommended that the WCEAR project not provide street parking in order to facilitate emergency response. No on-street parking is proposed for the WCEAR. Construction plan drawings will also be provided to the Fire Department for their approval.

3.11 SOCIO-ECONOMIC CHARACTERISTICS

The United States Census 2000 estimates the population for the City and County of Honolulu to be 876,156 people, or 72.32% of the state's population. Population estimates for specific localities within the project area include: 10,814 for Nanakuli; 5,943 for Maili; 10,506 for Waianae, 7,753 for Makaha; and 1,289 for Makaha Valley. The Waianae District has an estimated total population of 36,305 people.

The State of Hawaii Data Book estimated the 1999 City and County of Honolulu civilian labor force to be 424,250 people with 20,950 people unemployed. The highest number of jobs were in the Service Industry with 124,000 jobs, followed by Wholesale and Retail Trade with 96,500 jobs. The Agriculture Industry had the lowest job count with 2,200 jobs. The average annual per capita income for Honolulu in 1998 was \$28,670, which was higher than the State average of \$26,759.

Anticipated Impacts and Mitigative Measures

The proposed project is not expected to have a significant impact on the population of the Waianae District. While road improvements are sometimes known to increase populations by increasing accessibility, the proposed WCEAR corridors are intended for use during emergency situations when Farrington Highway is closed. Further, the use of an "Agricultural Road" design standard would not promote intense development, as this road type is not compatible with those uses. Most of the roads included in the WCEAR are existing streets that would be designated as part of specific bypass routes.

The proposed project will create short-term direct and indirect employment in the design and construction industry, which would have a positive impact on the economy. No mitigative measures are proposed.

3.12 SOILS AND TOPOGRAPHY

The Waianae District is demarcated by the Waianae Mountains, a 3 million year old volcanic mountain range formed from basalt flows. Since the end of its active phase, the mountain range has been eroded by precipitation and stream flow. Cinder cones are still found along the coast and are identified as Puu Haleakala, Puu o Huluhu, Puu Mailiili, Puu Paheehee, and Puu Kamaile. Mount Kaala in the Waianae Mountains is the highest peak on the island of Oahu.

Soil information from the coastline to the areas mauka of the proposed roadway corridors was obtained from the Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, produced by the United States Department of Agriculture Soil Conservation Service and the University of Hawaii Agricultural Experiment Station August 1972. The following soil types are present in the areas proposed for the new connector roads:

- CR** **Coral Outcrop** occurs from coral reefs formed when sea levels were higher than they currently are. The typical makeup includes coral or cemented calcareous sand. Elevations range from sea level to 100 feet.
- LPE** **Lualualei Extremely Stony Clay, 3 to 35 percent slopes**, are well-drained soils occurring on talus slopes, in areas that are moderately sloping to steep. Runoff is medium to rapid, and the erosion hazard is moderate to severe.
- LuA** **Lualualei Clay, 0 to 2 percent slopes**, consists of well-drained soils on alluvial fans. Elevations range from 10 to 125 feet. Permeability is slow, runoff is slow, the erosion hazard is slight, and in places where roots penetrate to at least a 5-foot depth, the shrink-swell potential is high.
- LuB** **Lualualei Clay, 2 to 6 percent**, are well-drained soils on coastal plains, alluvial fans, and on talus slopes. Elevations range from 10 to 125 feet. Runoff is low and the erosion hazard is slight.
- LvA** **Lualualei Stony Clay, 0 to 2 percent slopes**, is a well-drained soil occurring on fans adjacent to drainageways. Elevations range from 10 to 125 feet.
- MnC** **Mamala Stony Silty Clay Loam, 0 to 12 percent slopes**, are shallow, well-drained soils formed in alluvium over coral limestone and consolidated calcareous sand. Permeability is moderate, runoff is very slow to medium, and erosion hazards are slight to moderate.

WkA **Waialua Silty Clay, 0 to 3 percent slopes**, are moderately well-drained soils occurring on smooth coastal plains. Formed from basic igneous rock, they range in elevation from 10 to 100 feet. Permeability is moderate, runoff is slow, and the erosion hazard is slight.

Anticipated Impacts and Mitigative Measures

The proposed project is not expected to have any impact on the soils and topography of the area. The majority of the roads included in the bypass system are existing streets.

The WCEAR proposes to construct six roadway segments. Each segment will be developed as a separate roadway improvement. Each set of plans will have an Erosion Control Plan. Best Management Practices (BMPs) will be implemented to minimize short-term erosion impacts during construction. Additionally, dust control practices such as watering of the soil will reduce the amount of dust generated during construction. Planting of landscaping as soon as possible will also help to reduce dust emissions and soil loss from exposed soils.

3.13 SURFACE WATER AND DRAINAGE

The Waianae District has many well-defined streams that are considered culturally important features that provided fresh water for bathing, washing, human consumption and agriculture. These streams include: Nanakuli Stream in Nanakuli Valley; Ulehawa Stream and Maililiii Stream in Lualualei Valley; Kaupuni Stream and Kawiwi Stream in Waianae Valley; and East Makaha Stream in Makaha Valley.

The project requires the construction of three vehicular bridges that are described in Section 2.2. The Nanakuli Makai connector roadway would span Nanakuli Stream, the extension of Paakea Road would span Ulehawa Stream and the Kaulawaha Road extension improvements would span Makaha Stream. These streams are considered intermittent, meaning that they are continually flowing at the upper elevations but have irregular flows at the lower elevations, usually only after significant rainfalls.

Anticipated Impacts and Mitigative Measures

Surface water resources may be temporarily affected by runoff and erosion from grading and temporary removal of vegetation near streambeds. No significant long-term impacts to the streams in the Waianae District are expected because most of the streets included in the system are existing streets. Also, the three proposed bridges are currently designed to avoid their respective stream beds. Final engineering designs will provide the information necessary to determine if Stream Channel Alteration Permits will be necessary. All approvals and permits will be obtained prior to construction.

The project is not expected to significantly impact drainage patterns. There are no storm drains in the project area and the use of primarily existing streets will minimize the additional amount of non-porous surface that would be added relative to the construction of the new roadway corridors. The three new

bridges will be designed and constructed to meet the requirements of FIRM Flood Elevations and City and County of Honolulu Drainage Standards. A Department of the Army Permit may be required for the discharge of dredged or fill material or the placement of fill material within the limits of navigable waters of the U.S. If final engineering designs show that U.S. waters are present and may be affected by the proposed improvements, the City will consult with the Army Regulatory Branch, Honolulu Engineer District.

Additionally, the Army Corps of Engineers recently completed the Lualualei Flood Study that evaluated numerous areas subject to flooding in the Lualualei region of the Leeward Coast. The study describes the installation of an 8-foot by 12-foot box culvert in the Paakea Roadway extension right-of-way. Should the WCEAR improvements commence before the Lualualei Flood Study improvements, the 8-foot by 12-foot box culvert could be installed in the grassed shoulder area of the proposed Paakea Road extension to Hakimo Road in Lualualei/Maili. An easement width of 6-feet to 10-feet would be required in addition to the existing roadway right-of-way.

Erosion control Best Management Practices (BMPs) will be implemented to minimize short-term erosion and water quality impacts during construction. Additionally, most of the streams in the project area are intermittent, with measurable flows occurring only during significant storm events.

3.14 TRAFFIC CONDITIONS

Existing traffic conditions and anticipated future traffic conditions with the project are detailed in the Traffic Impact Analysis Report – Waianae Coast Emergency Access Road, Waianae, Oahu (Julian Ng, Inc., July 2001), which is included as Appendix F. The findings are summarized below.

Farrington Highway is the only roadway providing access to and from the Waianae Coast. It is a four-lane divided highway from Kapolei to Kahe Point, where it becomes a four-lane undivided highway. The four lanes narrow to two lanes at Makaha Valley Road until its western terminus at Keawaula. Because Farrington Highway serves as a corridor for both local traffic and for commuter trips outside of Waianae, it regularly becomes congested, especially during peak travel times.

Within the Waianae area, traffic volumes increase as one moves from Makaha toward Nanakuli. Average daily traffic estimates for Farrington Highway in 1999 range from 1,975 North of Lawaia Street to 41,025 south of Nanakuli Avenue. Morning peak hours for traffic typically occur between 7:00 AM and 8:00 AM and afternoon peak hours between 4:00 PM and 5:00 PM. The greatest morning peak hour traffic in 1999 was found south of Nanakuli Avenue with 1,735 vehicles moving in the southbound direction, and 935 in the northbound direction. Afternoon peak hour flows were greatest in the same area with 1,075 moving in the southbound direction and 2,000 in the northbound direction.

Driveways, schools, and the lack of left turn lanes in some portions of the roadway decrease the capacity of Farrington Highway. Pipeline failures, construction or repair work, storm surf, tsunami, traffic crashes, or other public safety issues have resulted in partial or complete closures of portions of the roadway several times during the past few years.

Anticipated Impacts

During mainly the beginning and ending phases of construction, heavy equipment traveling to and from the site may temporarily impact traffic flow. Vehicle movement through the construction areas would also be hindered and/or rerouted. However, the project is intended to provide periodic relief from the difficulties faced by future closures of Farrington Highway due to accidents, debris on the road, or other emergencies. The implementation of this project will enable more reliable access throughout the Waianae Coast.

The proposed project will follow agricultural roadway standards and provide a single 12-foot wide lane of traffic and an 8 to 13-foot wide grassed shoulder in each direction. The roads will be constructed to accommodate standard City buses. The roadway capacity for the WCEAR system is estimated to be 1,440 vehicles per hour in each direction. Current traffic volumes on some of the existing roads are approximately 150 vehicles per hour.

Peak hourly volumes on Farrington Highway are less than 1,000 vehicles per hour in the Waianae to Makaha area. The WCEAR system should be able to handle the diverted traffic in these sections with moderate to congested conditions on the emergency bypass route. The increased traffic on local streets along the emergency route would produce impacts such as increased difficulty in entering traffic from side streets and driveways and possibly the loss of on-street parking. Increased travel times would result from increased travel distances and slower speeds on the emergency route. However, this would still improve on the travel delays currently experienced when Farrington Highway is closed entirely and traffic is at a standstill.

The proposed project is not expected to completely alleviate traffic congestion when Farrington Highway is closed in Nanakuli or Maili. However, it would accommodate some flow of traffic around the blocked area until the closure is removed.

Farrington Highway closures south of Hakimo Road during either the morning (7:00 AM – 8:00 AM) or the afternoon (4:00 PM – 5:00 PM) peak traffic hours would result in congestion and queues on the emergency bypass roads. Capacity conditions on the emergency bypass roads would continue for more than one hour with delays to motorists possibly exceeding one hour. Queuing may occur for as long as three hours until traffic demand drops below roadway capacity.

The WCEAR bypass roads between Hakimo Road and Waianae Valley Road could carry traffic volumes slightly in excess of the estimated afternoon peak hour volumes. Farrington Highway closures may result

in queues as traffic demand exceeds the capacity of the detour roads. This overflow is expected to last for approximately one hour before demand drops below capacity. The proposed detours are expected to be able to handle the traffic demand at any time of day other than during peak hours (between 7:00 AM and 8:00 AM and between 4:00 PM and 5:00 PM). Impacts similar to those described for Waianae and Makaha are expected for the Lualualei/Maili Subdistrict.

Mitigative Measures

To reduce impacts on traffic, construction activities and movement of equipment would be restricted to specific start and curfew times to avoid impacting peak traffic periods. Appropriate signage would direct vehicles around or through the construction zones. Notice to the community and all affected residents should be provided prior to construction. A “hotline” phone number should also be posted at detour points or roadway closures to address project concerns.

Once the WCEAR is operational, impacts on local roads are expected to be temporary and restricted to only those times when the emergency bypass route is active when Farrington Highway is closed. Vehicles are not expected to use the bypass roads when Farrington Highway is open because of the longer distances that must be traveled in comparison to Farrington Highway, as well as the lower speed limits (25 miles per hour) for the emergency bypass roads in comparison with those for Farrington Highway (35 miles per hour). Additionally, the Nanakuli Makai connector roadway, the Helelua Place extension and the Hakimo Road to Pakeke Street connector will be closed to public access except during emergencies. Appropriate traffic controls such as signs and markings should be provided during emergency rerouting.

3.15 UTILITIES AND INFRASTRUCTURE

This section discusses the infrastructure and utilities present in the project area. Additional discussion on current and upcoming projects, including utility and transportation projects, may be found in Section 5 – Other Projects in the Vicinity.

3.15.1 POTABLE WATER

Existing potable water lines run along the length of Farrington Highway right-of-way. No water lines are within the proposed Nanakuli Makai connector roadway right-of-way but water lines are present in Helelua Street and Helelua Place. There are also potable water lines along at least portions of all of the existing streets included in the emergency bypass system, with the exception of Lualualei Naval Road.

The proposed improvements for the four connector roadway corridors are not anticipated to impact existing potable water lines. The City and County of Honolulu’s online Geographic Information System identifies an existing potable water line that runs along a portion of the proposed Kaulawaha Road extension. The existing line runs along the segment of existing Kaulawaha Road that is near Kamaile Elementary School and continues mauka towards the cliff/puu where the existing Kaulawaha Road turns

into a dirt road/trail. The new connector roadway improvements proposed in this area will need to identify and take into consideration the actual location of the potable water line prior to construction.

Anticipated Impacts and Mitigative Measures

The project will have minimal impact potable water lines because most of the streets in the system are existing streets that do not require any improvements. Of the proposed roadway segments to be constructed, only Helelua Place and the Kaulawaha Road extensions have potable water lines running through a portion of that connector roadway corridor. Consultation with the Board of Water Supply will ensure minimal impact to water service in these areas.

3.15.2 WASTEWATER COLLECTION

The City and County of Honolulu's online Geographic Information System identifies sewer lines along the entire length of the Farrington Highway right-of-way. Sewer lines are also located on Helelua Place, Plantation Road, Ala Hema Street, and Lahaina Street, and on parts of Lualualei Homestead Road, Kaulawaha Road, Maiuu Road, and Makaha Valley Road.

Anticipated Impacts and Mitigative Measures

The proposed project is not expected to impact wastewater collection because most of the roads in the WCEAR would not need any construction or improvements. Only the proposed Nanakuli Makai segment between Nanakuli Avenue and Pohakunui Avenue has a sewer line in the vicinity of its right-of-way. Construction of this roadway would not impact the sewer line due to its depth and the relatively shallow grading required for the new roadway. Also, this roadway is proposed for emergency use only and will therefore not be subject to constant weight loads that might affect the buried sewerline. Consultation with the City and County of Honolulu Department of Environmental Services will ensure minimal impact, if any, to wastewater services.

3.15.3 POWER AND COMMUNICATIONS

Electricity to the project area is supplied by the Hawaiian Electric Company (HECO) and telephone service is provided by Verizon Hawaii, formerly GTE Hawaiian Tel.

Anticipated Impacts and Mitigative Measures

The proposed roadway corridors that will remain permanently open will require street lighting. Currently, only the Paakea Road Extension is proposed for permanent public access. Electrical service will be provided by HECO. A HECO vault may be impacted by the construction of the Nanakuli Makai roadway corridor. No telephone or call box services are planned. The proposed improvements are not anticipated to create significant demand for electrical services.

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SECTION 4 ALTERNATIVES CONSIDERED

4.1 NO ACTION

The “No Action” alternative would maintain existing conditions on Farrington Highway, the sole publicly accessible route for motorized vehicles into and out of the Waianae District. Vehicular traffic becomes deadlocked when Farrington Highway is closed due to water main breaks, car accidents or other emergencies. Motorists traveling on Farrington Highway have been stuck on the roadway for hours at a time during such emergency situations.

The “No Action” alternative would have no impact on the existing physical or social environment. However, “No Action” would perpetuate the existing situation that limits accessibility between Waianae and Honolulu. The “No Action” alternative does not fulfill City policies to “establish an Emergency Road...that can be used as an alternate to Farrington Highway for those times when Farrington Highway may be impassable,” as is stated in the Waianae Sustainable Communities Plan.

4.2 SUB-ALTERNATIVE ROUTES CONSIDERED

Nanakuli Mauka Alternative. The possibility of routing the entire Nanakuli section of the WCEAR mauka of Farrington Highway was investigated. This alternative would provide a roadway that is less likely to flood or to be hindered by ocean debris. However, the land mauka of Farrington Highway was determined to be unfeasible for the project due to the topography of the area. The mauka route was also determined unfeasible because of current land uses including a Department of Hawaiian Home Lands Subdivision, Nanakuli Intermediate and High Schools, and Camp Andrews (which is scheduled for new construction including the new Nanakuli IV Elementary School).

Nanakuli Makai Alternative. Also investigated was a Nanakuli route that would have been constructed makai of both Farrington Highway and the OR&L Railroad tracks from Pohakunui Avenue to Lualualei Naval Road. The current preferred route follows a similar alignment from Pohakunui Avenue to Nanakuli Avenue. However, extension of this makai roadway past Nanakuli Avenue would require a bridge deck over the drainage channel fronting Nanaikapono Elementary School. Also under this alternative, the school’s fenceline would need to be relocated 40 feet makai of its current position, therefore resulting in a loss of a portion of the existing front yard. North of the school, the Ulehawa Beach Park frontage wall would need to be removed and reconstructed 40 feet closer to the shoreline to accommodate the new connector roadway. The new beach wall would also need to be higher than the existing wall. Approximately 150 recently planted coconut palm trees along the Ulehawa Beach Park frontage would also need to be removed and relocated. The new connector roadway corridor would

require almost complete reconstruction of the recently completed Ulehawa Beach Park improvements. Additionally, numerous sidewalks that provide access to park and school facilities would need to be reconstructed and the indigenous kipukai found mauka of Nanaikapono School would have been affected.

SECTION 5 OTHER PROJECTS IN THE VICINITY

Any project has the potential to produce impacts on the environment when added to other actions. Therefore, other current and recently proposed projects are discussed in this section and are related to the proposed Waianae Coast Emergency Access Road project.

5.1 FARRINGTON HIGHWAY REALIGNMENT AROUND MAKAHA BEACH PARK

The Oahu Regional Transportation Plan lists the Farrington Highway Realignment Around Makaha Beach Park (Project Number W-5) in its Transportation for Oahu Plan (TOP) 2025 Projects. This project is intended to provide access into and out of Keaau, Ohikilolo and Makua if flooding from Makaha Stream makes Farrington Highway impassable. This realignment would intersect the WCEAR project only at Kili Drive. However, the Kili Drive portion of the WCEAR is not planned for improvements or construction. Therefore, these two projects should not interfere with or overlap each other.

5.2 LEEWARD BIKEWAY OR&L RAILWAY EASEMENT

The State Department of Transportation (DOT), Highways Division is developing a 10-foot wide graded bikeway with 2-foot graded shoulders within the former O.R. & L. Railroad right-of-way. The Leeward Bikeway will require the construction of bridges, retaining walls, railroad crossings, and culverts.

This bikeway will overlap with the proposed WCEAR connector roadway within the Nanakuli Sub-district where the bikeway will run between Farrington Highway and the new connector roadway from Pohakunui Avenue up to Nanakuli Avenue. The Nanakuli Makai segment will only be open during emergencies and should therefore minimally affect this project. Coordination with the DOT will be needed to minimize conflicts.

5.3 WAIANAE COAST WATER MAIN REPLACEMENT

In July of 2001, the Honolulu Board of Water Supply (BWS) began its project to replace 13 miles of old, corroded water lines from Honokai Hale along Farrington Highway to Makaha. The project is divided into five phases, ending in 2004. The project schedule is listed below:

Phase I:	Kalaeloa Boulevard to Aliinui Drive	Apr. 2001 to June 2002
Phase II:	Haleakala Avenue to Hakimo Road	Oct. 2001 to Dec. 2002
Phase III:	Kaulawaha Road to Jade Street	Aug. 2001 to July 2001
Phase IV:	Jade Street to Lawaia Street	Mar. 2003 to Feb. 2004
Phase V:	Aliinui Drive to Haleakala Avenue	July 2003 to Dec. 2004

Phases 2 through 5 overlap the WCEAR project area and it is also likely that the time frame for the two projects will overlap. WCEAR project coordinators should work with the BWS to minimize impacts.

5.4 NANAKULI 242' RESERVOIR

The Honolulu Board of Water Supply (BWS) is constructing a 2 million gallon reservoir in Nanakuli, off of Maiaiholena Place, mauka of the residential subdivision. The reservoir will also require the installation of a 20-inch transmission main to connect it to lines along Farrington Highway. Construction is expected to begin in 2003 and last for approximately one year.

The installation of the transmission pipe may overlap with the construction activities associated with the WCEAR project. The proposed new connector roadway in that area is located along the makai side of Farrington Highway. Although the BWS line will be coming from the mauka side of the Highway, coordination will be needed to minimize disruption of traffic patterns.

5.5 TGN HAWAII CABLE SYSTEM

Tycom Networks (US) Inc. is installing a transpacific submarine and fiber optic cable system to supplement its existing global telecommunication capacity. The cable will be brought onshore at Kahe Point Beach Park and at the Waianae Wastewater Treatment Plant outfall. The cables will run from a manhole constructed at each landing site along the Farrington Highway right-of-way to a cable station in Maili. Phase I of the project includes all land-side construction activities consisting of installation of new manholes and ductlines along Farrington Highway and Phase II will include preparation of the landing sites, cable landings, running the cables through the Farrington Highway ducts, and connection of the cable to the new manholes at Kahe and Lualualei Beach Parks.

This project will affect traffic along Farrington Highway and will therefore need to be coordinated with the WCEAR project. The initial timeline for project construction is to begin in July of 2001 and to end in December. The final EA was published in the July 8, 2001 issue of the Office of Environmental Quality Control Environmental Notice.

5.6 NANAİKAPONO SUBDIVISION UPGRADES

The Department of Hawaiian Home Lands (DHHL) is upgrading the basic infrastructure in its Nanaikapono Lots Subdivision. These infrastructure improvements include upgrading Laumania, Pohakunui, Piliokahi and Keaulana Avenues to two-lane, 24-foot wide paved roads with curbs, gutters, turn-arounds and wheelchair ramps. Also included is a signalization at the intersection of Piliokahi Avenue and Farrington Highway, roadway signage, pavement markings, adjusted and/or relocated water lines, new sewer lines and new drain lines with catch basins.

This infrastructure improvement project will directly link with the Nanakuli section of the WCEAR system connector roadway that is proposed to terminate at Pohakunui Avenue. Coordination between DHHL and the Department of Transportation Services will be required.

5.7 NANAKULI IV ELEMENTARY SCHOOL

The Department of Accounting and General Services and the State Department of Education are developing Nanakuli IV Elementary School on the mauka side of Farrington Highway across from the existing Nanaikapono Elementary School. Upon completion, Nanaikapono Elementary School will be relocated to this site.

The original WCEAR Nanakuli Makai segment was aligned between the OR&L Railroad right-of-way and the existing Nanaikapono Elementary School on the makai side of Farrington Highway. This connector roadway would have required that the existing Nanaikapono Elementary School fence be relocated 40-feet makai of its existing location. The current proposed WCEAR segment eliminates the impact to Nanaikapono Elementary School and should not impact the proposed Nanakuli IV site.

5.8 KAMAILE ELEMENTARY SCHOOL EXPANSION

The Department of Education (DOE) is planning an expansion of Kamaile Elementary School in the Waianae Subdistrict to meet its standard design enrollment for an elementary school. The intended expansion area wraps around the eastern bend of Ala Akau Street for a total area of approximately 5 acres. New facilities proposed for the new area include a parking area, a play field, an 8-classroom building and two portable classroom buildings.

The WCEAR Mahinaau Road Extension had previously been designed to wrap around the existing Kamaile Elementary School and connect to Ala Akau Street after the bend in the road. However, after consultation with the DOE regarding the school's expansion plans, the connector roadway was rerouted around the new area to connect directly with Plantation Road with a connection to Ala Hema Street.

5.9 SECOND ACCESS HIGHWAY THROUGH WAIANAE RANGE

A new mauka second highway access route between Waianae and the Ewa District has been suggested for a number of years. This route is considered mainly as a “reliever road” to ease congestion on Farrington Highway. The Oahu Metropolitan Planning Organization, in its TOP 2025 project list, has estimated that a “Second Access Across the Waianae Range” would cost approximately \$515 million. Currently, the City’s Department of Transportation Services is investigating the feasibility of constructing a one-mile tunnel through the Waianae Mountain Range from Lualualei Valley to Kunia Road. The road specifications under this scenario would include 24 feet of pavement and a 35 mile-per-hour speed limit. Estimated construction costs for a road constructed under these specifications were between \$200 and \$250 million. The estimated time frame for completion is 8 – 10 years. Preliminary engineering studies for this second highway have not yet begun. However, preliminary reconnaissance work, including cultural evaluation in particular, is being planned for mid 2002.

SECTION 6 PERMITS REQUIRED

The proposed project may require various permits from the Federal, State and County levels of government. A few of these permits may not be required pending final engineering designs and measurements. All necessary permits will be acquired prior to construction.

6.1 FEDERAL PERMITS

The following Federal permits may be required prior to construction of the emergency access roads described in this Environmental Assessment.

<u>Permit</u>	<u>Agency</u>
Section 404 Permit	U.S. Army Corps of Engineers
National Pollution Discharge Elimination	Department of Health

6.2 STATE PERMITS

The following State permits may be required:

<u>Permit</u>	<u>Agency</u>
Coastal Zone Management (CZM) Program Federal Consistency	Department of Business, Economic Development & Tourism
Conservation District Use Permit	Department of Land & Natural Resources
Stream Channel Alteration Permit (SCAP)	Department of Land & Natural Resources
New, Relocation and Modification Access Rights Into or Rights to Use State Highway Property	Department of Transportation
Permit to Perform Work Within a State Highway	Department of Transportation
Section 401 Water Quality Certification	Department of Health
Variance From Pollution Controls	Department of Health

6.3 CITY AND COUNTY PERMITS

The following City and County permits may be required:

<u>Permit</u>	<u>Agency</u>
Grubbing, Grading and Stockpiling Permit	Department of Planning and Permitting
Public Infrastructure Map Revision	Department of Planning & Permitting
Shoreline Setback Variance	Department of Planning & Permitting
Sign Permit	Department of Planning & Permitting
Special Management Area Permit (SMA)	Department of Planning & Permitting
Street Usage Permit for Construction	Department of Transportation Services

The bridge construction over Nanakuli Stream will require a Section 404 permit from the Army Corps of Engineers, 401 Certification from the Department of Health, Coastal Zone Consistency certification and a Stream Channel Alteration permit from the Water Commission. An SMA permit will also be required for the Nanakuli Makai connector roadway.

A Department of the Army Permit may be required for the discharge of dredged or fill materials. If there is a potential for navigable waters of the United States to be affected by the project, the Regulatory Branch, Honolulu Engineer District will be consulted to determine whether or not a Department of the Army Permit is required.

Currently, no Army Corps of Engineers permit or Stream Channel Alteration permit would be required under the construction scenario described for the Ulehawa Stream Bridge and the Makaha Stream Bridge. No portion of the bridge structures is expected to encroach into the stream channels or the bank areas. However, if the stream channels or banks are physically touched, these permits would be required. Stream Channel Alteration Permits may delay construction, as the application process may be lengthy. However, because each new roadway segment may be constructed independently of one another, construction may occur while some segments are awaiting permit approval.

SECTION 7 FINDINGS AND DETERMINATION

The following is an assessment, based on the thirteen (13) "Significance Criteria" of Title 11, Chapter 200-12 of the Department of Health Administrative Rules, to determine whether or not the proposed project will have a significant impact on the environment.

- 1) *Involves a loss or destruction of any natural or cultural resources;*

Development of the project is not anticipated to involve the loss or destruction of any significant natural or cultural resources in the area. Most roads included in the WCEAR are pre-existing. New roads will mostly follow existing roadway lots. Communication is ongoing with the DLNR-SHPD, the Oahu Burials Council and the local community to determine proper handling of the archaeological features documented at the Kamaile site in the Kaulawaha Road Extension area. Construction work will be under the supervision of a cultural monitor. If additional cultural resources are uncovered, work will stop and the DLNR-SHPD will be consulted.

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

Development of the proposed connector roadway segments will not significantly curtail beneficial uses of the land. The improvements planned will enhance public mobility throughout the Waianae District when Farrington Highway is obstructed.

- 3) *Conflicts with the State's long-term goals or guidelines as expressed in Chapter 344, HRS;*

The proposed connector roadway segments are not anticipated to have any significant long-term negative environmental impacts, and therefore do not conflict with the long-term goals or guidelines expressed in Chapter 344, HRS.

- 4) *Substantially affects the economic or social welfare of the community or state;*

The project is anticipated to have a positive impact on the economy. Construction of the project will result in short-term direct and indirect construction employment, which will have a positive effect on the economy. Emergency access will reduce wasted time spent idle in traffic during times when Farrington Highway is obstructed.

5) *Substantially affects public health;*

Short-term noise and air quality impacts may occur during the construction phase of the project. However, these impacts can be adequately mitigated. The project will be developed in accordance with applicable State and County laws and regulations so that there is no adverse impact on public health.

6) *Involves substantial secondary effects, such as population changes or infrastructure demands;*

The project will not have secondary effects on population or infrastructure demands.

7) *Involves a substantial degradation of environmental quality;*

No long-term noxious uses or emissions will result from the project, and no degradation of the environmental quality is expected.

8) *Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment to larger actions;*

Implementation of the Waianae Coast Emergency Access Road system is not anticipated to have considerable negative effect on the environment. It does not represent a commitment to larger actions.

9) *Substantially affects a rare, threatened or endangered species or habitat;*

Most of the land areas within the proposed connector roadway corridors have been disturbed in the past. No rare, threatened or endangered species or habitats are known to exist within the project area.

10) *Detrimentially affects air or water quality or ambient noise levels;*

No long-term air quality, water quality or ambient noise impacts are anticipated from the project. Short-term construction noise and air quality impacts will be mitigated as discussed in earlier sections of this Environmental Assessment.

- 11) *Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water or coastal water;*

The road system is intended to detour residents around those areas of Farrington Highway that are sensitive to damage. The proposed Nanakuli Makai connector roadway is within the Special Management Area (SMA) and is intended to serve as a bypass to Farrington Highway only under emergency conditions. The proper SMA permits will be acquired before proceeding with the construction of this connector roadway.

- 12) *Substantially affects scenic vistas and view planes identified in county or state plans or studies;*

The proposed connector roadways will not inhibit scenic vistas and view planes that have been identified in County or State plans or studies. The proposed traffic bridge over Nanakuli Stream is a portion of the proposed connector roadway makai of Farrington Highway through Nanakuli. The traffic bridge would be approximately 5 – 6 feet higher in elevation than the existing pedestrian bridge, and therefore higher than Farrington Highway. This bridge may slightly impact scenic vista and view planes, especially looking towards the ocean from Farrington Highway. However, this increased height is required to meet FIRM flood elevations.

- 13) *Require substantial energy consumption;*

The project will not require substantial energy consumption.

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SECTION 8

LIST OF INDIVIDUALS, ORGANIZATIONS AND AGENCIES CONSULTED

The following is a list of agencies and organizations that were contacted while preparing the EA. The purpose of the consultation is to identify issues that may need to be discussed. Included in this section is a list of the organizations that were contacted during the pre-consultation phase, as well as those comments that were received on the Draft EA. Also included are copies of the comments letters and responses to substantive comments.

AGENCY/ORGANIZATION	PRE-CONSULTATION COMMENTS RECEIVED	DRAFT EA COMMENTS RECEIVED
FEDERAL GOVERNMENT		
• Navy Region Hawaii.....	✓	✓
• 25 th Infantry Division, US Army Hawaii.....		✓
STATE OF HAWAII		
Department of Education.....		✓
Department of Hawaiian Home Lands		
• Hawaiian Homes Commission.....		✓
Department of Health		
• Office of Environmental Quality Control.....		✓
Department of Land and Natural Resources		
• Historic Preservation Division.....		✓
• Land Division.....		✓
Department of Transportation.....	✓	✓
CITY AND COUNTY OF HONOLULU		
• Councilmember John DeSoto		
• Civil Defense Department		
• Department of Design and Construction.....	✓	✓
• Department of Facility Maintenance.....		✓
• Department of Planning and Permitting.....	✓	✓
• Department of Transportation Services		
Public Transit Division		
• Emergency Services Department		
• Fire Department.....	✓	✓
• Police Department.....	✓	✓
• Waianae Neighborhood Board #24.....		✓

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CORRESPONDENCE

Pre-Consultation Letters

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POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
<http://www.honolulu.gov>
www.honolulupd.org
www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR



LEE D. DONOHUE
CHIEF
MICHAEL CARVALHO
ROBERT AU
DEPUTY CHIEFS

OUR REFERENCE CS-KP

August 16, 2001

Ms. Mary O'Leary, AICP
c/o Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. O'Leary:

Thank you for the opportunity to comment on the proposed Waianae Coast Emergency Access Roads Pre-Consultation in preparation of a Draft Environmental Assessment.

Since this proposal will provide an alternate route through Waianae, it should have a positive impact on the services and facilities of the Honolulu Police Department.

If there are any questions, please call Ms. Carol Sodehani of the Support Services Bureau at 529-3658.

Sincerely,

LEE D. DONOHUE
Chief of Police

By
EUGENE UEMURA
Assistant Chief of Police
Support Services Bureau

Serving and Protecting with Aloha

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 FAX: (808) 523-4567
WEB SITE ADDRESS: www.co.honolulu.hi.us



JEREMY HARRIS
MAYOR

RAE M. LOUI, P.E.
DIRECTOR
GEORGE YAMASHIRO
DEPUTY DIRECTOR
ERIC G. CRISPIN, AIA
ASSISTANT DIRECTOR
CDEA 01-0075

August 30, 2001

Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96713

Attention: Ms. Sherri Hiraoka

Aloha, Ladies and Gentlemen:

Subject: Proposed Wai'anae Coast Emergency Access Roads

This is in response to your August 6, 2001 letter requesting information on potential issues regarding the subject project. We will provide the appropriate review of the EA for the subject project when it is transmitted to our department for review and comments.

Mr. Marvin Char of my staff did have a conversation with Mr. David Bills of Gray Hong Bills Nōjima & Associates, Inc., regarding issues relating to roadway requirements, and referred Mr. Bills to the Department of Planning and Permitting, the appropriate City agency to address his concerns.

If there are any further questions, please contact Mr. Char at 527-6381.

Very truly yours,

RAE M. LOUI, P.E.
Director

MC:dk

RECEIVED
10/11/01

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

3375 KOA'AKA STREET, SUITE H425 • HONOLULU, HAWAII 96819 • 1869
TELEPHONE: (808) 531-7761 • FAX: (808) 531-7750 • INTERNET: www.co.honolulu.hi.us



JEREMY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF

JOHN CLARK
DEPUTY FIRE CHIEF

Ms. Mary O'Leary, AICP
Page 2
August 21, 2001

Should you have any questions, please call Battalion Chief Kenneth Silva of our Fire Prevention Bureau at 831-7778.

August 21, 2001

Sincerely,

Ms. Mary O'Leary, AICP
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. O'Leary:

Subject: Proposed Waianae Coast Emergency Access Roads
Pre-Consultation in Preparation of a Draft Environmental Assessment

We received a letter dated August 6, 2001, from Ms. Sherri Hiraoka, Staff Planner with Townscape, Inc., requesting that the Honolulu Fire Department (HFD) review and comment on the Draft Environmental Assessment for the proposed Waianae Coast Emergency Access Roads.

The HFD requests that the following be complied with:

1. The access roads shall have a minimum vertical clearance of 13 feet 6 inches, be constructed of an all-weather driving surface complying with Department of Transportation Services (DTS) standards, capable of supporting the minimum 60,000 pound weight of our fire apparatus, and with a gradient not to exceed 20%. The unobstructed width of the fire apparatus access road shall meet the requirements of the appropriate county jurisdiction. All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround having a radius complying with DTS standards.
2. Adequate no-parking zones should be added along the "route" to deter on-street parking, which would facilitate the response of emergency vehicles by allowing traffic to move to the side of the road.
3. Submit civil drawings to the HFD for review and approval.


ATTILIO K. LEONARDI
Fire Chief

AKL/SK:jo

cc: Cheryl Soon, Director, Department of Transportation Services
David Bills, Project Engineer, Gray Hong Bills Nojima & Associates

DEPARTMENT OF PLANNING AND PERMITTING

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 523-4414 • Fax: (808) 527-6743



JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

August 31, 2001

2001/CLOG-3458 (MS)

Ms. Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813



Dear Ms. Hiraoka:

SUBJECT: Request for Comments in Preparation of Draft
Environmental Assessment
Maianae Coast Emergency Access Roads (WCEAR)

This is in response to your letter dated August 6, 2001, requesting comments on the above-referenced project. The comments are as follows:

SITE DEVELOPMENT DIVISION:

1. Improve or build roadways to City standards to the greatest extent possible.
2. Any roadway improvement may require adjustment of sewer manhole tops to new finish grade. Any sewer line subjected to vehicular loading requires a minimum of 4 feet of cover. If less than 4 feet cover, reinforced concrete jacketing of the sewer line is required.
3. The project will require the submission for approval by our department of application(s) to subdivide the proposed roadway rights-of-way.
4. Construction plans shall be submitted for our review and approval.
5. The project will require construction within areas designated as floodway in the Federal Flood Insurance Rate Map. Clarify whether the improvements will be designed to not cause any increase in the regulatory flood elevations in the floodway district.

Townscape, Inc. (MS)
Page 2

6. Some new road segments will involve work within the State Conservation District. Obtain review and necessary approvals from the State Department of Land and Natural Resources (DLNR).

LAND USE PERMIT DIVISION:

1. Portions of the newly proposed roads are within the Special Management Area and are subject to the requirements of Chapter 25, Revised Ordinances of Honolulu. Newly constructed roads will require Special Management Area permits.
2. Portions of the proposed roadway may be within the 40-foot shoreline setback. This work will require a shoreline setback variance.
3. The Historic Preservation Division of DLNR shall be consulted regarding potential impacts to historic resources.

Should you have any questions on the Land Use Permit Division comments, please contact Ardis Shaw-Kim at 527-5349. For questions on the Site Development Division comments, please contact Mario Siu-Li at 523-4247.

Sincerely yours,

RANDALL K. FUJIKI, AIA
Director of Planning and Permitting

RKF:ms
(1132705ev1)



Gray • Hong • Nofjima & Associates, Inc.
CONSULTING ENGINEERS

COPY

Daniel S. C. F. ...
David B. B. ...
Mina N. ...
Beverly G. ...
Sheryl E. ...
841 Bishop Street, Suite 1100
Honolulu, Hawaii 96813
Telephone: (808) 521-0395
Fax: (808) 531-8018
honolulu@ghnhawaii.com

December 7, 2001

Mr. Randall Fujiki, AIA, Director
Department of Planning and Permitting
City and County of Honolulu
650 S. King Street, 7th Floor
Honolulu, Hawaii 96813

SUBJECT: Waianae Coast Emergency Access Road
Environmental Assessment Consultation Comments

Dear Mr. Fujiki:

We thank you for your letter dated August 31, 2001 regarding the EA for the subject project. We are providing the following responses to your comments:

SITE DEVELOPMENT BRANCH

1. Your request is to have the roadways improved to the maximum extent possible. The Department of Transportation Services, through its consultant, has been holding numerous community meetings regarding the emergency roadway system. All permanent sections of roadway are in Agricultural zoning districts or Country zoning districts. The proposed roadway section is a City Agricultural/Country District Street pursuant to Section 1-109 of the Subdivision Rules and Regulations.

This typical roadway has been presented at all Leeward Community meetings and has been endorsed by the community. Please refer to the project website (WCEAR.org). This website contains a current version of the proposed roads, as well as a complete set of minutes for each community meeting.

The Leeward Community is committed to implementing the emergency road plan, but has no interest in creating additional development pressures in agricultural/country zoning districts. Fully improved roads are perceived to increase development pressures.

The WCEAR also has sections of road that will be gated, except for emergency use as directed by the Honolulu Police Department (Waianae Subdistrict). Due to the limited and controlled use, the roadway design proposed is also the agricultural standard. The critical design criteria is that the pavement section and horizontal alignment be able to support public transportation (i.e., The Bus).

Mr. Randall Fujiki, AIA, Director
Department of Planning and Permitting
December 7, 2001
Page 2

We are attaching a key plan showing the roadway sections which will be built in conjunction with the project. The key plan identifies the permanent and emergency use only sections.

The WCEAR roadway section is a critical item for the project. We would appreciate your additional comments concerning this supplemental information.

2. Sewer adjustments will comply with 4-foot minimum cover or the sewer will be jacketed.
3. Subdivision plans and applications will be processed with the City for any subdivision work required with respect to the roadway rights-of-way.
4. Construction plans will be submitted for all roadway improvements.
5. There are three proposed bridge structures involved with the project. All three cross FIRM floodways. The design criteria will be to maintain City and County Drainage Standards freeboard above the regulatory flood elevation. A drainage report will be prepared for all three bridge structures and this report will be processed in conjunction with the construction plans. No-rise is proposed for the floodway.
6. A small section of the WCEAR crosses the Conservation District in the Makaha/Kamaile area. A CDUP will be processed with the State Department of Land and Natural Resources.

LAND USE DIVISION

1. One section of proposed WCEAR roadway in Nanakuli is below Farrington Highway and within the Special Management Area. The approval processing for this section of roadway will include a Special Management Area Permit application.
2. No section of the Nanakuli WCEAR roadway is in the 40-foot shoreline setback. This will be confirmed during the SMP processing.
3. An archaeological reconnaissance is being performed for all new segments of WCEAR roadway. This report will be included in the EA and submitted to DLNR - State Historic Preservation Office.

Mr. Randall Fujiki, AIA, Director
 Department of Planning and Permitting
 December 7, 2001
 Page 3

Should you have any questions regarding this matter, please contact our office.

Very truly yours,

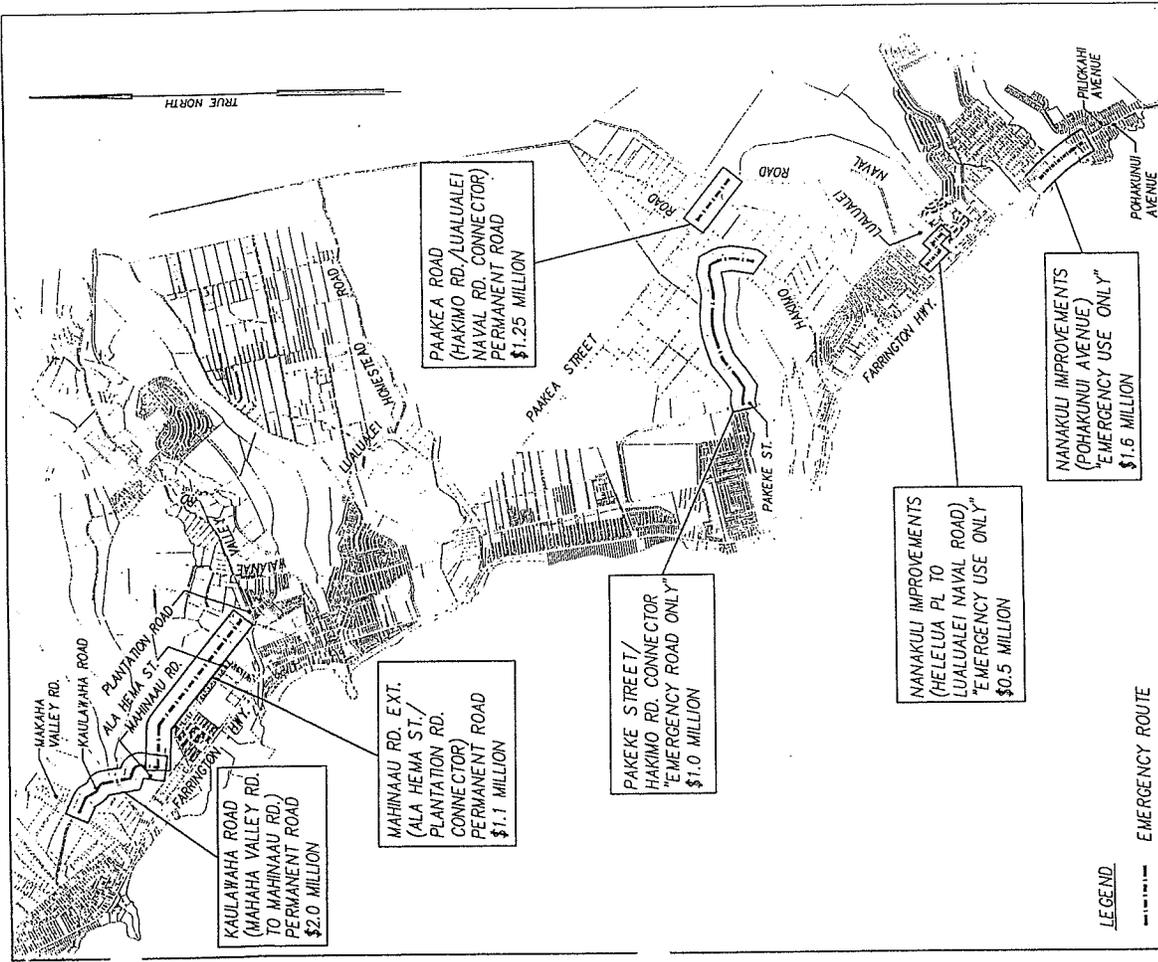
GRAY, HONG, BILLS, NOJIMA & ASSOCIATES, INC.



David B. Bills

DB:co
 2810
 Attachment

cc: C. Soon, DTS



SCALE: 1" = 4000'		KEY MAP	 Gray-Hong-Bills-Nojima & Associates, Inc. CONSULTING ENGINEERS 841 Bishop Street Suite 1100	FIGURE
CAD DRAWING: KEYMAP				
DATE: NOV 14, 2001				

ANDREW J. SATO

Attorney

564 Hahaione Street, Apt H

P. O. Box 25697

Honolulu, Hawaii 96825-0697

Telephone: (808) 396 9555

Facsimile: (808) 396 9788

Department of Transportation Services
September 21, 2001
Page 2

of Helelua Road in the Makaha direction was under review in the past. This extension will connect the access road into Luualalei Naval Road. This extension will obviate the necessity of going over and across Parcel 76.

In summary then, we do not favor the September 12th proposal of cutting across Parcel 76. We suggest and propose the extension of Helelua Road in the Makaha direction, mauka of Parcel 76, and then into Luualalei Naval Road. We believe our suggestion and proposal would better serve the community as a whole.

We are willing to meet with your consultants and staff to resolve our concerns. Thank you for your assistance.

Sincerely yours,

ANDREW J. SATO

Andrew J. Sato

Attorney for Leeward Hawaii, Inc.

(Owner of Parcel 76)

cc Mr. David B. Bill
wce211

September 21, 2001

City and County of Honolulu

Department of Transportation Services

711 Kapiolani Blvd, Suite 1200

Honolulu, Hawaii 96813

Re: Waianae Coast Emergency Access Road/ Leeward Hawaii, Inc.
(Owner of TMK: 8-7-08:Parcel 76)

Attn: Ms. Cheryl Soon

Dear Ms. Soon:

On September 12, 2001, I attended the WCEAR meeting at the Nanakuli High School. I represented Leeward, the owner of Parcel 76. For the reasons stated below, we think that proposed access road of September 12th adversely affect my client's lot.

We are aware of the concerns of the Waianae Coast community and their traffic problems when Farrington Highway becomes impassable along the Waianae Coast. Accordingly, we see the necessity for an emergency access road. Therefore, we do not object to the concept of an emergency access road.

Please refer to the Nanakuli Sub-District Map of September 12, 2001 prepared by Townscape, Inc.. We do not favor the proposed extension of Helelua Place in the Makaha direction where the extension cuts over and across Parcel 76. By cutting across Parcel 76, the lot is split into "two parcels". This parcel is being considered for a proposed planned unit development now. Schematics are prepared and the negotiation and financing for the sale of the project are being finalized now. The "cut across" would place this PUD project in an awkward position. The project is designed as a cohesive development by the use of parcel 76 as one lot. The "two parcels" development impairs the PUD.

We suggest and propose an alternative route. We think that our proposal would benefit the community. Please refer to the Nanakuli Sub-District Map. An alternative road for your consideration is the use of Helelua Road beyond and mauka of Helelua Place. We do not have the details but we think that an extension

TE-4217
TS01.126

November 16, 2001

Mr. Andrew J. Sato, Esq.
564 Hahaione Street, Apt. H
P. O. Box 25697
Honolulu, Hawaii 96825-0697

Dear Mr. Sato:

Subject: Waianae Coast Emergency Access Road, TMK: 8-4-8: 76

We thank you for your letter dated September 21, 2001 regarding the subject project. As presented at the Waianae Coast Emergency Access Road (WCEAR) General Meeting for the project on September 12, 2001, other options for access through Nanakuli has been determined to not be viable. Therefore, a segment crossing your property has been reactivated from the initial planning process.

We understand you are concerned that this WCEAR segment may have impact on development plans for the project. The topographic survey is completed for the proposed WCEAR alignment and I understand our consultant, David Bills, is trying to schedule a meeting with you.

The potential WCEAR roadway segment crossing your property is proposed for emergency use only and will be gated and chained until such time that emergency access is required under the direction of the Honolulu Police Department (Waianae Subdistrict). The design calls for 24 feet of asphaltic concrete pavement with 10-foot wide grassed shoulders. This roadway segment may be able to be designed into your project as one of your access driveways.

Incidentally, we are also working with you neighbor that has frontage on Luahuaiei Naval Road (TMK: 8-4-8: 77).

Should you have any questions regarding this matter, please contact Mike Oshiro of my staff at 527-5031.

Sincerely,

61

CHERYL D. SOON
Director

cc: Gray, Hong, Bills, Nojima & Associates

jjf(M. Oshiro)

TS01126.wpd

NOV 16 2001

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DEPARTMENT OF THE NAVY
 COMMANDER
 NAVY REGION HAWAII
 517 RUSSELL AVENUE, SUITE 110
 PEARL HARBOR, HAWAII 96860-4884

11011
 Ser N464/ 09902
 28 Sep 01

Ms. Sheri Hiraoka
 Townscape, Inc.
 900 Fort Street Mail, Suite 1160
 Honolulu, HI 96813

Dear Ms. Hiraoka:

**SUBJECT: PROPOSED WAI'ANAE COAST EMERGENCY ACCESS ROADS
 PRE-CONSULTATION IN PREPARATION OF A DRAFT
 ENVIRONMENTAL ASSESSMENT**

Thank you for your letter of August 7, 2001, soliciting the Navy's comments on the pre-consultation process of preparing the draft Environmental Assessment for the proposed Wai'anae Coast Emergency Access Roads.

As requested, Commander, Navy Region Hawaii agrees in concept with the proposed project and its inherent benefits to the residents of the Wai'anae Coast. The following comments are provided for your consideration in preparation of the draft environmental assessment.

Lualualei Naval Access Road is currently owned by the Navy and is not a public thoroughfare. Commercial activities located along our roadway currently utilize the road in conjunction with their businesses under real estate agreements with the Navy. However, private residential property owners along the lower portion of the road also use it for access to and from Farrington Highway without authorization from the Navy.

For the past 20 years, the Navy has intermittently held discussions with the City concerning conveyance of the Lualualei Naval Access Road to the City. It is our intention, via separate correspondence directly with the City, to take this opportunity to renew these discussions on the conveyance of the road at least up to the proposed connection of the Wai'anae Coast Emergency Access Road (WCEAR) at Paakea Road. Should this conveyance be executed, we would still request immediate notification prior to activation of the emergency access route, as the road will continue to be our primary access route for the support of naval operations in Lualualei Valley.

Additionally, should the City implement the WCEAR, we assume that the existing roads involved will be improved to City standards. Currently, at Paakea Road, which borders Navy property, there is a six to ten-foot offset from the edge of pavement and the Navy's security fence. In the past two and a half years, the fence has been damaged four times from vehicular accidents on Paakea Road. With increased traffic flow during emergency usage, as well as rerouting due to permanently opened connectors, the end result could be an increase in vehicular accidents along Paakea Road. Accordingly, we request that a traffic study be completed to evaluate the impact from the proposed project along Paakea Road and the portion of Lualualei Naval Access Road affected by the WCEAR, and, if deemed necessary, construction of a physical barrier (e.g., berm or guardrail).

11011
 Ser N464/ 09902
 28 Sep 01

The Navy would like to be included on future distribution of the environmental assessment. To expedite review, please send six copies of the document to the following address:

Commander, Navy Region Hawaii
 Attention: Regional Environmental Dept. N465
 517 Russell Avenue, Suite 110
 Pearl Harbor, Hawaii 96860-4884

If you have any questions, please contact Ms. Jill Kaya at 471-1170 extension 245 or Mr. Randy Miyashiro at 471-1171 extension 275.

Thank you again for your letter and the opportunity to participate in the pre-consultation phase of the draft environmental assessment. We look forward to working with you and the City and County of Honolulu on this most important project.

Sincerely,

R. T. CONWAY, JR.
 Rear Admiral, U.S. Navy

Copy to: Ms. Mary O'Leary, AICP
 Ms. Cheryl Soon, Director City and County of Honolulu
 Department of Transportation Services
 Mr. David Bills, Project Engineer
 Gray Hong Bills Nojima & Associates
 Commander, Pacific Division, Naval Facilities
 Engineering Command (RE241, ENV PLN 23)
 Commanding Officer, Naval Magazine, Pearl Harbor
 Commanding Officer, Naval Computer and Telecommunications
 Area Master Station Pacific



Gray • Hong • Bills • Nojima & Associates, Inc.
CONSULTING ENGINEERS

COPY

Charles C. Hwang, Jr.
David S. E. ...
Saverly G. ...
Sheryl E. ...

841 Bishop Street, Suite 1100
Honolulu, Hawaii 96813
Telephone: (808) 521-0306
Fax: (808) 531-8018
honolulu@ghbhawaii.com

December 7, 2001

R. T. Conway, Jr.
Rear Admiral, U. S. Navy
Navy Region Hawaii
517 Russell Avenue, Suite 110
Pearl Harbor, Hawaii 96860-4884

SUBJECT: Waianae Coast Emergency Access Road (WCEAR)
EA Consultation Comments

Dear Rear Admiral Conway:

We thank you for your letter dated September 28, 2001 regarding the subject WCEAR. Your primary comment is that the Navy would like to re-initiate discussions leading toward the City and County of Honolulu (City and County) takeover of ownership of Luahalei Naval Road in conjunction with the WCEAR project. At this time, the City and County wants the WCEAR project to become a realization as soon as possible. Therefore, we have no objections to re-initiating discussions on taking over ownership of this road, but hope that this issue will not delay implementation of the project.

Your letters also express concern that the permanently open sections of the WCEAR may increase traffic on Paakea Road next to your property. This is an area where your property's fences have been damaged due to traffic accidents. You have reported four such incidents over the years. There are no current plans to improve existing sections of Paakea Road where public transportation (The Bus System) currently operates. However, as the City's consultant, we would like to meet with your staff representatives to review this issue in more detail to evaluate options.

We have also referred your letter to the project's traffic consultant, and it is felt that opening Paakea Road to Luahalei Naval Road will not generate significantly larger traffic volumes during non-emergency situations. Farrington Highway is still by far the preferred travel way. Under emergency conditions, traffic will be slow moving due to the traffic volume. Further, the traffic flow will be under the direction of the Honolulu Police Department (Kapolei and Waianae Stations). Due to the lack of anticipated new traffic under normal operating situations and the unique conditions of emergency operations, there will be little or no value in undertaking a traffic study. The soon to be circulated Draft Environmental Assessment does have an overall traffic assessment.

Should you have any questions regarding this matter please contact our office.

Very truly yours,

GRAY, HONG, BILLS, NOJIMA & ASSOCIATES, INC.

David B. Bills

DB:co
2810
cc: C. Soon, DTS

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BENJAMIN J. CAYetano
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

OCT 9 2001

Ms. Mary O'Leary, AICP
c/o Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. O'Leary:

Subject: Proposed Waianae Coast Emergency Access Roads
Pre-Consultation in Preparation of a Draft Environmental Assessment

Thank you for your transmittal requesting our comments regarding the subject project. We have the following comments:

1. In concept, we support the intent of the project.
2. We require the submittal of a traffic assessment report at locations where the emergency access roads intersect Farrington Highway.
3. Plans must be submitted and coordinated with our Highways Division for all work done within our Farrington Highway right of way.
4. Early consultation and coordination with our Highways Division must be initiated for the roadway corridor that is proposed in Nanakuli, makai side of Farrington Highway between the OR & L Railroad and the Nanaikapono Subdivision.

If you have any questions, please contact Ronald Tsuzuki, Head Planning Engineer, Highways Division, at 587-1830.

Very truly yours,

BRIAN K. MINAAI
Director of Transportation

BRIAN K. MINAAI
DIRECTOR
DEPUTY DIRECTORS
GLENN M. OKIMOTO
JAQUNE Y. UHASAKI

IN REPLY REFER TO:
HWY-PS
2.4338



Gray • Hong • Nohjima & Associates, Inc.
CONSULTING ENGINEERS

Mr. Brian Minaai, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, HI 96813-5097

SUBJECT: Waianae Coast Emergency Access Road
EA Consultation Comments

Dear Mr. Minaai:

We thank you for your consultation comments dated October 3, 2001. We are providing the following information regarding your comments:

1. We acknowledge and appreciate your conceptual support of the project.
2. The only location where any new segment of WCEAR roadway will connect to Farrington Highway is at the intersection of Nanakuli Avenue. The project maintains a web site (WCEAR.org) showing the proposed roadway segment. This web site also maintains a complete record of minutes of meetings in the community.
The new section of roadway is proposed for use only under emergency situations and under the traffic control direction of the Honolulu Police Department (Waianae Subdistrict). When this segment of roadway is used, there will be significant disruption of the routine traffic flow and the value of any traffic assessment report seems questionable under this operating scenario.
An Operations component of the WCEAR is being prepared to outline the procedures that will be followed for this location and other existing roadway locations along the Leeward Coast. The primary agency to be involved in rerouting of traffic under emergency situations is the Honolulu Police Department (Waianae Subdistrict).
3. It is known that any roadway work connecting to and within the Farrington Highway right-of-way will require construction plan submittal to the Right-of-Way Branch, as well as Construction Branch.
4. The purpose of the EA and additional meeting with DOT is to ensure early coordination.

Should you have any questions regarding this matter, please contact our office. We would appreciate your response regarding item 2 above.

Very truly yours,

GRAY, HONG, BILLS, NOJIMA & ASSOCIATES, INC.

David B. Bills

DB:co
2810
cc: C. Soon, DTS

DAVID B. BILLS
CAYetano
GLENN M. OKIMOTO
JAQUNE Y. UHASAKI
S. Y. E. Nohjima, P.E.
841 Bishop Street, Suite 1100
Honolulu, Hawaii 96813
Telephone: (808) 521-0353
Fax: (808) 531-8018
honolulu@bhnhawaii.com

COPY

December 7, 2001

CORRESPONDENCE

Draft EA Comment Letters
and Responses

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TOWNSCAPE, INC.
Environmental and Community Planning

900 Fort Street Mail, Suite 1160
Honolulu, Hawaii 96813
Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscap@lava.net

April 4, 2002

Colin Kippen, Jr., Deputy Administrator
State of Hawaii
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

Dear Mr. Kippen:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- The road alignments have been adjusted to avoid archaeologically sensitive areas discovered near one of its road sections. The City will continue to work with the Department of Land and Natural Resources, State Historic Preservation Division, the Oahu Burial Council and the community in order to ensure the best possible management of archaeological finds.
- The Final EA will provide additional evaluation of the potential project impacts to the streams in the area. It will particularly cover the potential need for consultation with the Department of the Army regarding the construction of the bridges in Nanakuli, Lualualei and Makaha.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka
Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

PHONE (808) 594-1888



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPIOLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

FAK (808) 594-1885

January 14, 2002

Mike Oshiro
Department of Transportation Services
711 Kapiolani Blvd., Suite 1200
Honolulu, HI 96813

Subject: Draft Environmental Assessment--Wai'anae Coast Emergency Access Road

Dear Mr. Oshiro:

Thank you for the opportunity to comment on the above-referenced project. OHA offers the following comments on the draft environmental assessment.

Cultural Resources

OHA notes that draft EA includes assessment and mitigation of impacts to cultural resources. The draft EA states that the proposed route will be realigned to avoid impacts on cultural resources discovered during the archeological survey. The draft EA also assures that a cultural monitor will be present during construction.

Streams

The draft environmental assessment does not provide an adequate evaluation of the streams that will require the construction of new bridge crossings. The draft EA states that no significant long term impacts are expected because the project mainly consists of existing streets. However, the three new bridges and their impacts on Nanakuli Stream, Ulehawa Stream, and Makaha Stream should be discussed further in the final EA.

If you have any questions, please call Sharla Manley, Policy Analyst, at 594-1944.

Sincerely,

Colin Kippen, Jr.

Colin Kippen, Jr.
Deputy Administrator

CK: sam

CC: Board of Trustees
Clyde W. Namu 'o, Administrator
Office of Environmental Quality Control
/ Sherri Hiraoka, Townscape Inc.



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

January 16, 2002

Regulatory Branch

Ms. Sherri Hiraoka
Project Planner
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

This responds to your request dated January 4, 2002 regarding a request for written comments for a Draft Environmental Assessment (dEA) which will address activities proposed for the Waianae Coast Emergency Access Road Project, Waianae, Oahu Island. The information provided in your dEA identifies 3 general, improved road crossings at the East Makaha Stream, Ulehawa Stream and Nanakuli Stream locations with no specific engineering solutions for each of the respective bridges. Until more detailed information is provided we can only state that a Department of Army permit may be required should the discharge of dredged or fill material be imminent.

Our records also indicate that other waters of the United States, as represented by perennial or intermittent streams and wetlands may occur adjacent to the various areas proposed for road improvements. The Final EA should, at a minimum, address the potential for navigable waters of the U.S. to be affected, or not be impacted by construction and use of the proposed emergency access road improvements. Finally, if engineering design studies for the proposed access road should identify that waters of the U.S. are present and will be affected by proposed engineering solutions, consultation should take place with the Regulatory Branch, Honolulu Engineer District, to determine whether a Department of Army permit application shall be submitted for the placement of fill material within the limits of jurisdictional waters.

Please contact Mr. Farley Watanabe of my staff at 438-7701, Fax 438-4060, if you have any questions or additional information. Please refer to File Number 200200153 in any future correspondence with us.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

Copy furnished:
Mr. Mike Oshiro, Project Planner, Department of Transportation Services, City & County of Honolulu, 700 Kapiolani Boulevard, 3rd Floor, Honolulu, Hawaii 96813

TOWNSCAPE, INC.

Environmental and Community Planning

900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscap@lava.net

April 4, 2002

George P. Young, Chief
Regulatory Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Dear Mr. Young:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- The Final EA will acknowledge the potential for navigable waters of the U.S. to be affected by construction and use of the proposed improvements.
- If final engineering designs show that U.S. waters are present and will be affected by the proposed improvements, the City will consult with the Regulatory Branch, Honolulu Engineer District to determine whether a Department of the Army permit is necessary.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P.O. BOX 2380
HONOLULU, HAWAII 96804

PATRICIA HAMAMOTO
JANESAN SUPERINTENDENT

TOWNSCAPE, INC.
Environmental and Community Planning
900 Fort Street Mail, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscap@java.net

April 5, 2002

OFFICE OF THE SUPERINTENDENT

January 22, 2002

Patricia Hamamoto, Superintendent
State of Hawaii
Department of Education
P.O. Box 23360
Honolulu, Hawaii 96804

Dear Ms. Hamamoto:

Ms. Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mail, Suite 1160
Honolulu, Hawaii 96813

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA). Your letter will be included in the Final EA document.

Dear Ms. Hiraoka:

If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Subject: Waianae Coast Emergency Access Road Draft EA

Sincerely,

Sherri Hiraoka
Staff Planner

The Department of Education (DOE) notes that the proposed access road has been realigned to go around the planned Kamaile Elementary School expansion area. This new alignment is acceptable to DOE.

Thank you for the opportunity to respond. If you have any questions, please call Mr. Sanford Beppu at 733-4862.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:hy

cc: A. Suga, OBS
M. Oshiro, DOT/C&C

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111
<http://www.honolulu.gov>
www.co.honolulu.hi.us



JEREMY HARRIS
MAYOR

LEE D. DONOHUE
CHIEF
MICHAEL CARVALHO
ROBERT AU
DEPUTY CHIEFS

OUR REFERENCE CS-KP

January 24, 2002

Ms. Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the proposed Waianae Coast Emergency Access Road.

The Honolulu Police Department fully supports the implementation of the proposed project. Its impact during any closure of Farrington Highway will be beneficial to the community and will have a positive impact on our facilities and the services we provide.

If there are any questions, please call Ms. Carol Sodehani of the Support Services Bureau at 529-3658.

Sincerely,

LEE D. DONOHUE
Chief of Police

By 
KARL GODSEY
Acting Assistant Chief of Police
Support Services Bureau

cc: Mr. Mike Oshiro, DTS

Serving and Protecting with Aloha

TOWNSCAPE, INC.

Environmental and Community Planning

900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813
Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscap@lava.net

April 8, 2002

Chief Lee D. Donohue
City and County of Honolulu
Police Department
801 S. Beretania Street
Honolulu, Hawaii 96813

Dear Chief Donohue:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA). Your letter will be included in the Final EA document.

If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,



Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates



DEPARTMENT OF THE NAVY
 COMMANDER
 NAVY REGION HAWAII
 517 RUSSELL AVENUE, SUITE 110
 PEARL HARBOR, HAWAII 96860-4884

11011
 Ser N464/ 0002
 29 JAN 2002

Ms. Cheryl Soon
 Director
 Department of Transportation Services
 City and County of Honolulu
 711 Kapiolani Boulevard, Suite 1200
 Honolulu, HI 96813

Dear Ms. Soon:

Subj: PROPOSED WAI'ANAE COAST EMERGENCY ACCESS ROADS

We are in receipt of a letter from your consultant, Gray, Hong, Bills, Nojima & Associates, Inc. regarding subject City and County of Honolulu (City) proposed improvement project. In the letter, your consultant indicated that the City has no objections to our request to re-initiate discussions on the conveyance of a portion of the Naval Magazine Luahalei Access Road from the Navy to the City, but hopes that this process will not delay the implementation of your project. While we are pleased to hear that you have no objections to discussing the conveyance, we prefer to have the implementation of that portion of your project contingent upon the successful transfer of property. We will make every effort possible to expedite the process so as not to delay implementation of your project.

We are ready to discuss this issue and support your efforts in improving roadway accessibility for the residents of Hawaii.

Navy Region Hawaii point of contact is Ms. Jill Kaya, 471-1170 extension 245.

Sincerely,

J. L. Mustain
 J. L. MUSTAIN
 Captain, CEC, USN
 Program Manager for Facilities,
 Environmental, Safety and
 Passenger Transportation
 By direction of
 Commander, Navy Region Hawaii

Copy to: Mr. David Bills, Gray, Hong, Bills, Nojima & Associates, Inc.
 Commander, Pacific Division, Naval Facilities Engineering
 Command (RE241)

FEB -1 2002
 2410
 DH DP
 cc: S. HIRAOKA

TOWNSCAPE, INC.

Environmental and Community Planning
 900 Fort Street Mall, Suite 1160
 Honolulu, Hawaii 96813

Phone: (808) 536-6999
 Fax: (808) 524-4998
 E-mail: townscap@lava.net

April 5, 2002

Captain J.L. Mustain, Program Manager
 Facilities, Environmental, Safety & Passenger Transportation
 Navy Region Hawaii
 517 Russell Avenue, Suite 110
 Pearl Harbor, Hawaii 96860-4884

Dear Captain Mustain:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- The City is still interested in pursuing discussions with the Navy concerning conveyance of a portion of Luahalei Naval Road to the City. Preliminary contact has occurred to discuss this transfer.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka
 Sherri Hiraoka
 Staff Planner

cc: Michael Oshiro, Department of Transportation Services
 David Bills, Gray, Hong, Bills, Nojima & Associates

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

3275 KOAHIKA STREET, SUITE 1425 • HONOLULU, HAWAII 96819-1899
TELEPHONE: (808) 931-7761 • FAX: (808) 931-7750 • INTERNET: WWW.COHONOLULU.HI.US



JEREMY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF
JOHN CLARK
DEPUTY FIRE CHIEF

Ms. Sherri Hiraoka, Staff Planner
Page 2
January 30, 2002

Should you have any questions, please call Battalion Chief Kenneth Silva of our Fire Prevention Bureau at 831-7778.

January 30, 2002

Ms. Sherri Hiraoka, Staff Planner
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

Subject: Draft Environmental Assessment
Proposed City and County of Honolulu
Waianae Coast Emergency Access Road

We received your letter dated January 4, 2002, regarding the proposed Waianae Coast Emergency Access Road. The Honolulu Fire Department (HFD) requests that the following be complied with:

1. The access road shall have a minimum vertical clearance of 13 feet 6 inches, be constructed of an all-weather driving surface complying with Department of Transportation Services (DTS) standards, capable of supporting the minimum 60,000 pound weight of our fire apparatus, and with a gradient not to exceed 20%. The unobstructed width of the fire apparatus access road shall meet the requirements of the appropriate county jurisdiction. All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved turnaround having a radius complying with DTS standards.
2. Adequate no-parking zones should be added along the "route" to deter on-street parking, which would facilitate the response of emergency vehicles by allowing traffic to move to the side of the road.
3. Submit civil drawings to the HFD for review and approval.

Sincerely,

Handwritten signature of Attilio K. Leonard.

ATTILIO K. LEONARDI
Fire Chief

AKL/SK:hh

cc: Mike Oshiro, Department of Transportation Services, City and County of Honolulu

TOWNSCAPE, INC.

Environmental and Community Planning

900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscape@lava.net

April 5, 2002

Attilio K. Leonardi, Fire Chief
City and County of Honolulu
Fire Department
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819-1869

Dear Chief Leonardi:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- The proposed roads will comply with Department of Transportation Services standards, capable of supporting Fire Department apparatus. No dead-end roads are proposed in this project, as the intent of the WCEAR is to provide through-access.
- No on-street parking is proposed for the WCEAR. Agricultural road standards are being used to design the new roadways and do not provide for on-street parking.
- Civil drawings will be submitted to the Honolulu Fire Department (HFD) for review and approval.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. The City is looking forward to continuing their dialogue with the HFD in developing an effective emergency road. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka

Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

LAND DIVISION
P.O. BOX 821
HONOLULU, HAWAII 96809

February 1, 2002

LOG-605
LD-NAV
WAIANAEMACCESSROAD.RCM2

Townscape, Inc.
Environmental & Community Planning
Sherri Hiraoka, Staff Planner
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

SUBJECT: Review: Draft Environmental Assessment
Applicant: C&CoH Dept, of Transportation Services (DTS)
Project: Waianae Coast Emergency Access Road
Authority: City and County of Honolulu DTS
Location: Waianae, Island of Oahu, Hawaii
TMK: 1^{sc}/ 8-4; 8-5; 8-6; 8-7 and 8-9

This is a follow-up to our letter. (Ref.: WAIANAEMACCESSROAD.RCM) to you dated January 31, 2002, pertaining to the subject project.

Attached herewith is a recently received copy of the Land Division Engineering Branch comment.

The Department of Land and Natural Resources has no other comment to offer.

Should you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 808-587-0438.

Very truly yours,

HARRY M. YADA
Acting Administrator

C: Land Division Engineering Branch

AGRICULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CIVIL ENGINEERING AND RECREATION
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
ENVIRONMENTAL AND
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

LNR-LAND DIVISION
ENGINEERING BRANCH

LD/NAV /WAIANAEMACCESSROAD

COMMENTS

The project site, according to FEMA Community Panel Numbers 15003C 0215 E, 15003 C 0195E, and 15003 C 185 E is located in the following Zones:

1. Zone X - areas determined to be outside the 500-year floodplain.
2. Zone AE - areas in which base flood elevations are determined.
3. Zone D - areas in which flood hazards are undetermined

Improvements within flood zones must comply with rules and regulations of the National Flood Insurance Program (NFIP) and all applicable County Flood Ordinances. If there are questions regarding the NFIP, please contact the State Coordinator, Sterling Yong, of the Department of Land and Natural Resources at 587-0248.

Division of Forestry & Wildlife

1151 Punchbowl Street, Rm. 325 • Honolulu, HI 96813 • (808) 587-0166 • Fax: (808) 587-0160

January 23, 2002

MEMORANDUM

TO: Nick Vaccaro, Land Agent
Land Division

THRU: Harry Yada, Acting Administrator
Land Division

FROM: Michael G. Buck, Administrator
Division of Forestry and Wildlife

SUBJECT: Draft EA by City and County of Honolulu, Department of Transportation Services proposed Waianae Coast Emergency Access Road, Honolulu, Oahu, Hawaii TMK: Various (see draft EA).

We have reviewed the above referenced document and provide the following for your consideration. Please refer to attached reference map showing three (3) locations or areas that are highlighted in red for known endangered plants and accompanying legend describing location of plant species. We recommend that the City and County of Honolulu conduct a botanical plant survey by a trained botanist at these three locations where planning for the emergency access roads are being proposed. Please call Ms. Vickie Caraway, DOFAW Botanist at 587-0165 if you have questions regarding the three (3) referenced areas.

Attachments

C: Oahu DOFAW Branch
Ms. Vickie Caraway

RECEIVED
LAND DIVISION
2002 JAN 25 A 11:44
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII



RECEIVED
LAND DIVISION

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

LAND DIVISION

P.O. BOX 521

HONOLULU, HAWAII 96808
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII

AGRICULTURE DEVELOPMENT PROGRAM
ADULT SERVICES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONFERENCES
COURTESY WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

January 24, 2002

Ref: LD-BC

MEMORANDUM

TO: Harry M. Yada, Acting Administrator, Land Division

ATTN: Nicholas A. Vaccaro

FROM: Barry Cheung, Oahu District Land Office *Barry Cheung*

SUBJECT: DEA-Waianae Coast Emergency Access Road *M*

Upon the finalization of the project, please notify this office when an easement is required over State land. We have no further comment on the project.



STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 LAND DIVISION
 P.O. BOX 671
 HONOLULU, HAWAII 96809

January 31, 2002

LOG87-445-446 ID-NAV
 WAIANAEEACCESSROAD.RCM

Townscape, Inc.
 Environmental & Community Planning
 Sherri Hiraoka, Staff Planner
 900 Fort Street Mall, Suite 1160
 Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

SUBJECT: Draft Environmental Assessment
Applicant: C&OH Dept, of Transportation Services (DTS)
Project: Waianae Coast Emergency Access Road
Authority: City and County of Honolulu DTS
Location: Waianae, Island of Oahu, Hawaii
TMK: 1st/ 8-4; 8-5; 8-6; 8-7 and 8-9

Thank you for the opportunity to review and comment on the subject matter.

A copy of the Draft Environmental Assessment (summary) was submitted to the following Department of Land and Natural Resources' Divisions for their review and comment:

- Division of Aquatic Resources - Division of Forestry and Wildlife - Division of State Parks - Commission on Water Resource Management - Land Division Planning and Technical Services - Land Division Engineering Branch - Oahu District Land Office

Attached herewith is a copy of the Division of Forestry and Wildlife, Commission on Water Resource Management and Oahu District Land Office comment.

The Department has no other comment to offer at this time.

Should you have any questions, please feel free to contact Nicholas Vaccaro of the Land Division Support Services Branch at 808-587-0438.

Very truly yours,

Harry M. Yada
 HARRY M. YADA
 Acting Administrator

C: Commission on Water Resource Management
 Division of Forestry and Wildlife
 Oahu District Land Office

BENJAMIN J. CAVEYANO
 COUNTY CLERK



RECEIVED
 LAND DIVISION

STATE OF HAWAII 2002 JAN 25 A 11:45

DEPARTMENT OF LAND AND NATURAL RESOURCES
 COMMISSION ON WATER RESOURCE MANAGEMENT
 P.O. BOX 671
 HONOLULU, HAWAII 96809

January 24, 2002

TO: Harry Yada, Administrator
 Land Division

FROM: Linnel T. Nishioka, Deputy Director
 Commission on Water Resource Management (CWARM)

SUBJECT: Draft Environmental Assessment Waianae Coast Emergency Access Road
 FILE NO.: LD/NAV/WAIANAEEACCESSROAD

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

In general, the CWARM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWARM encourages the protection of water recharge areas, which are important for the maintenance of streams and the replenishment of aquifers.

- We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.
- We recommend coordination with the Land Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
- We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source or supply for the project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of this source.
- Groundwater withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- We are concerned about the potential for degradation of instream uses from development on highly erodible slopes adjacent to streams within or near the project. We recommend that approvals for this project be conditioned upon a review by the corresponding county's Building Department and the developer's acceptance of any resulting requirements related to erosion control.
- If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).
- If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.
- OTHER:

If there are any questions, please contact David Higa at 587-0249.

TOWNSCAPE, INC.

Environmental and Community Planning

900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscape@lava.net

April 5, 2002

Harry M. Yada, Acting Administrator
Department of Land and Natural Resources, Land Division
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Yada:

Thank you for your letters regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- Thank you for informing us that Stream Channel Alteration Permits may be necessary for the construction of one or more of the proposed bridges over Nanakuli, Uleahawa and Makaha Streams. The proper permits and approvals will be acquired prior to construction.
- A botanical survey was conducted in June and October of 2001 by trained botanist Winona P. Char of Char and Associates. A copy of the full botanical report may be found in Appendix E of the Environmental Assessment. Her survey revealed no endangered plants within the proposed project area. An indigenous species (kipukai), an endemic species (kaunaoa) and a species of concern (mao) may be impacted by the proposed WCEAR. No mitigation is required, however, efforts may be made to relocate the plants if necessary.
- The Land Division will be notified if the need for an easement is required over State Land at the appropriate time.
- Thank you for the flood zone information that you provided in your letter. Any improvements within flood zones will comply with National Flood Insurance Program regulations and applicable County Flood Ordinances

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,



Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

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DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 ULUOHIA STREET, SUITE 215, KAPOLEI, HAWAII 96707
TELEPHONE : (808) 692-5054 FAX: (808) 692-5857



JEREMY HARRIS
MAYOR

ROSS S. SASAMURA, P.E.
DIRECTOR AND CHIEF ENGINEER
ALVIN K. C. AU
DEPUTY DIRECTOR
IN REPLY REFER TO:
DRM 02-110

January 31, 2002

Ms. Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

Subject: Waianae Coast Emergency Access Road (WCEAR) Draft Environmental Assessment

Thank you for the opportunity to review the subject draft environmental assessment report. We provide the following comments:

1. The WCEAR Project proposes to construct six new connector roadways to link with existing streets to create a system of bypass routes. Three of these connector roadways will remain permanently open to traffic and three will be open for emergency use only.
- We request that all six connector roadways remain permanently open to traffic. The binding property of asphaltic pavement tends to deteriorate and become brittle when the roadway is abandoned to traffic for extended periods. The "kneading" effect of vehicular rubber tires keeps the asphalt pavement flexible.

Also, closed roadways are prone to become illegal dumping areas and, therefore, are more difficult to maintain. Since the roadways will need to be open to traffic with no advance notice during emergencies, keeping them clear and passable is imperative.

2. The WCEAR Project also proposes to construct the new connector roadways to typical agricultural roadway standards. Rather than using a standardized pavement structure, the roadway pavement should be designed to support and withstand the projected level of trucks and City buses that the pavement will be required to carry.

Should you have any questions, please call Mr. Charles Pignataro of our Division of Road Maintenance, at 527-6282.

Very truly yours,

Charles Pignataro
ROSS S. SASAMURA, P.E.
Director and Chief Engineer

TOWNSCAPE, INC.
Environmental and Community Planning
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscape@lava.net

April 5, 2002

Mr. Ross Sasamura, Director
City and County of Honolulu
Department of Facility Maintenance
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

Dear Mr. Sasamura:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- Permanent status was considered for every roadway in the proposed WCEAR project. However, the planning process revealed community opposition to permanent status for particular road segments due to concerns over child safety, continuation of neighborhood quality of life, access to archaeologically sensitive sites and dumping. The City determined that these community concerns outweighed the arguments for permanent status for all roadways. Therefore, while we appreciate your concern for the continued maintenance of the roadways, we respectfully decline implementing your suggestion for permanent vehicular access on all proposed new roadways.
- The agricultural roadway standard was used to design new roadways to maintain the rural character of the area. Higher levels of improvement were not selected in favor of these design standards so as not to induce further development. Also, the new roads are not expected to support heavy volumes of truck and bus traffic on a regular basis either due to "emergency use only" status or because the roadways are not superior to Farrington Highway under normal traffic conditions in terms of speed and capacity. Finally, the underlying zoning for all permanent sections of roadway is either Agriculture or Country and the proposed roadway is consistent with that zoning.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. The City is looking forward to continuing their dialogue with the HFD in developing an effective emergency road. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka
Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates



WAIANAЕ COAST NEIGHBORHOOD BOARD NO. 24

c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

February 6, 2002

Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, HI 96813
Attn: Ms. Sherri Hiraoka

Dear Ms. Hiraoka:

SUBJECT: Draft Environmental Assessment Proposed City and County of Honolulu Waianae Coast Emergency Access Route

The Wai'anae Coast Neighborhood Board No. 24, at its regularly scheduled meeting of February 5, 2002, voted unanimously to support the concept of the proposed plan as presented in the Draft Environmental Assessment (Draft EA).

We look forward to the concepts, as presented, in the Draft EA being implemented as quickly as possible to alleviate the on-going problems of dealing with delays in travel time as experienced over Farrington Highway during unanticipated delays, i.e. traffic accidents, water main breaks, etc.

If you have any questions or to provide further updates on the status of this project during future board meetings, please do not hesitate to contact me at 696-0131 or at rezentesc@aol.com.

Sincerely,

Cynthia K. L. Rezentes, Chair
Wai'anae Coast Neighborhood Board No. 24

cc: Neighborhood Commission Office
Councilmember John DeSoto
Senator Colleen Hanabusa
Representative Emily Auwae
Representative Michael Kainikina
City and County of Honolulu, Department of Transportation Services, Mr. Mike Oshiro

went24c0203



Oahu's Neighborhood Board System-Established 1973

TOWNSCAPE, INC.

Environmental and Community Planning

900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscape@lava.net

April 4, 2002

Ms. Cynthia Rezentes, Chair
Waianae Neighborhood Board No. 24
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, Hawaii 96813

Dear Ms. Rezentes:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and we hope to move toward project implementation as quickly as possible. Your letter will be included in the Final EA document.

If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

BENJAMIN J. GAYETANO
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

FEB 20 2002

BRIAN K. MINAAI
DIRECTOR
DEPUTY DIRECTORS
JEAN L. OSHITA
JACQUE V. URASAKI

IN REPLY REFER TO:
HWY-PS
2.5726

TOWNSCAPE, INC.
Environmental and Community Planning

900 Fort Street Mail, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscap@lava.net

April 5, 2002

Mr. Brian Minaai
The Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Minaai:

Townscape, Inc.
900 Fort Street Mail, Suite 1160
Honolulu, Hawaii 96813

Attn: Ms. Sherri Hiraoka

Gentlemen:

Subject: Draft Environmental Assessment (DEA), Proposed City and County of Honolulu,
Waianae Coast Emergency Access Road

Thank you for your transmittal requesting our comments regarding the subject project.

We are satisfied with your response to our attached comments dated October 3, 2001 (HWY-PS
2.4338).

If you have any questions, please contact Ronald Tsuzuki, Head Planning Engineer, Highways
Division, at 587-1830.

Very truly yours,

BRIAN K. MINAAI
Director of Transportation

c: City and County of Honolulu

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road
(WCEAR) project. We appreciate your interest in reviewing the Draft Environmental
Assessment (EA). Your letter will be included in the Final EA document.

If you have any additional questions or comments regarding this project, please call Sherri
Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

BENJAMIN J. CAYETANO
GOVERNOR



GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH ARERTANA STREET
SUITE 709
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4188

February 21, 2002

Ms. Cheryl Soon, Director
Department of Transportation Services
City and County of Honolulu
711 Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

Dear Ms. Soon:

Subject: Draft EA for the Waianae Coast Emergency Access Road, Oahu

Thank you for the opportunity to review this document. We have the following comments.

1. This project should comply with sections 103D-407 and 408 of Hawaii Revised Statutes concerning the use of indigenous plants and recycled glass.
2. This project will impact Nanakuli Stream. Impacts to the physical, biological and stream flow characteristics of Nanakuli Stream should be described. Please consult with the Commission on Water Resources Management.
3. Please describe the impacts of this project on Nanakuli Beach Park and the OR & L line.
4. Please describe if there are any noise sensitive receptors such as homes, schools, hospitals adjacent to the new permanent roads. If so, quantify the noise impacts and if required, propose mitigation measures.
5. Please consult with affected property owners.

Should you have any questions please call Jeyan Thirugnanam at 586-4185.

Sincerely,


Genevieve Salmonson
Director

c: Townscape

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TOWNSCAPE, INC.
Environmental and Community Planning

900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscap@lava.net

April 5, 2002

Ms. Genevieve Salmonson
State of Hawaii
Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- The City will comply with Hawaii Revised Statutes Chapter 103D §407 regarding the use of materials with specified recycled glass contents and §408 regarding the use of indigenous and/or Polynesian-introduced plant species when landscaping, where feasible.
- Additional information is being collected regarding Nanakuli Stream and will be included in the Final EA.
- The Department of Design and Construction indicated in their letter dated February 22, 2002 that Nanakuli Beach Park would be minimally impacted by the loss of land that would be required to construct the Nanakuli Makai segment of the WCEAR. Portions of the park may be fenced off during construction for safety reasons, although most of the park will still be available via other access points. The Nanakuli Makai segment is designated as "Emergency Use Only," and will only be open to vehicular access when an incident on Farrington Highway disrupts traffic in this area. Impacts will therefore be limited to only those times. Park access will still be available when this road segment is activated, although traffic through this end of the park will increase. The Police Department, the agency responsible for redirecting traffic, is represented on a team of City Agencies that are working together to develop an Operational Plan for the smooth movement of traffic around an emergency situation.

- The Department of Land and Natural Resources, State Historic Preservation Division and the Hawaiian Railway Society have both offered recommendations regarding the OR&L Railroad. Construction activities and the road itself will not encroach into the OR&L right-of-way (ROW). Also, designated crossings will be identified to minimize impacts to the track alignment at Nanakuli Avenue.

Ms. Salmonson
April 5, 2002
Page 2

- The only road that is currently being proposed for permanent status is the Paakea Road Extension. The land adjacent to this roadway segment contains grasses and shrubs and does not contain noise sensitive receptors such as homes, schools or hospitals. The Nanakuli Makai Improvements, the Helelua Place Extension and the Pakeke Street to Hakimo Road Connector are all proposed as "Emergency Access Only." The status of the Mahinau Road Extension and the Kaulawaha Road Improvements has not yet been decided.

- Affected property owners have all been contacted to inform them of this project. Individual consultations regarding specific actions regarding their properties will occur during the final design phase.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. The City is looking forward to continuing their dialogue with the HFD in developing an effective emergency road. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,



Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates



DEPARTMENT OF THE NAVY

COMMANDER
NAVY REGION HAWAII
517 RUSSELL AVENUE, SUITE 110
PEARL HARBOR, HAWAII 96860-4864

IN REPLY REFER TO:
5090
Ser N465/ 00061

21 FEB 2002

CERTIFIED MAIL NO. 7001 1940 0006 1626 2391

Ms. Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu HI 96813

Dear Ms. Hiraoka:

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT, PROPOSED CITY AND COUNTY
OF HONOLULU, WAI'ANA'E COAST EMERGENCY ACCESS ROAD

This responds to your recent request for review comments on the *Draft Environmental Assessment, Proposed City and County of Honolulu, Wai'anae Coast Emergency Access Road* prepared December 2001. We have prepared comments, which are provided in enclosure (1).

Thank you for the opportunity to comment. Please continue to include the Navy on future communications. Should you have any questions or comments, please contact Ms. Lisa Chan or Ms. Amanda Mano'i of my office at (808) 471-1171 extension 229 and 223 respectively.

Sincerely,

J. T. SOMMER
Commander, CEC, U.S. Navy
Director
Regional Environmental Department
By direction of
Commander, Navy Region Hawaii

Enclosure: 1. Review Comments

Copy to: City & County of Honolulu, Department of Transportation

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ENVIRONMENTAL COMPLIANCE OFFICE Commander Navy Region Hawaii, Code N465			
Review Comments	DATE: 02/21/02	PAGE: 1 OF 2	
PROJECT TITLE Draft Environmental Assessment, Proposed City and County of Honolulu, Wai'anae Coast Emergency Access Road, December 2001.	REVIEWED BY: N465/SK, TT, AM, RM, BH	N464/JK	
ACTIVITY Townscape, Inc./City and County of Honolulu, Hawaii	NAVFAC CONTRACT NO.		
LOCATION: Wai'anae Coast, O'ahu, Hawaii	SPECIFICATION NO.		

ENVIRONMENTAL COMPLIANCE OFFICE Commander Navy Region Hawaii, Code N465			
Review Comments	DATE: 02/21/02	PAGE: 2 OF 2	
PROJECT TITLE Draft Environmental Assessment, Proposed City and County of Honolulu, Wai'anae Coast Emergency Access Road, December 2001.	REVIEWED BY: N465/SK, TT, AM, RM, BH	N464/JK	
ACTIVITY Townscape, Inc./City and County of Honolulu, Hawaii	NAVFAC CONTRACT NO.		
LOCATION: Wai'anae Coast, O'ahu, Hawaii	SPECIFICATION NO.		

DWG NO. OR SPEC PARA. NO.	ITEM NO.	COMMENTS	ACTION
General	1	Will any construction work be required to upgrade the existing road to meet criteria that are suitable to accommodate public transportation and comply with City and County Agricultural Road Standards?	
General	2	The Navy requests to be notified prior to activating the Wai'anae Coast Emergency Access Road (WCEAR) project and including the use of Luualalei Naval Road regardless of ownership.	
Page 57	3	The document states that there may be possible ordnance? This matter should be presented to the Army Corps of Engineers for further comment.	
General	5	There have been numerous incidents of damage to the Navy fenceline along Paakea Road from vehicular traffic. By opening this roadway, there are concerns that this could increase. Will upgrades to Paakea Road incorporate protective measures (ie: guardrail or berm) between the Navy's fence and Paakea Roadway to alleviate any future damage to the Navy's fence?	

DWG NO. OR SPEC PARA. NO.	ITEM NO.	COMMENTS	ACTION
Figure 2-16	6	An alternate route via Kolekole Pass is shown, no discussion is included in this report. Recommend additional information be included regarding the route through Kolekole Pass.	
General	7	A colony of 'ihii'ihii (marsilea villosa) is located on Navy property near to the intersection of Paakea Road and Ili'ili Road. This should be addressed in this report.	

TOWNSCAPE, INC.
Environmental and Community Planning

900 Fort Street Mail, Suite 1160
Honolulu, Hawaii 96813
Phone: (808) 536-6999
Fax: (808) 524-4998
E-mail: townscap@java.net

April 5, 2002

Commander J.T. Sommer, Director
United States Navy
Regional Environmental Department
517 Russell Avenue, Suite 110
Pearl Harbor, Hawaii 96860-4884

Dear Commander Sommer:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

General Comments

- Mahinau Road will need upgrades and widening to meet the criteria for inclusion in the WCEAR project. However, this road is currently not the preferred alignment in this area. Kaulawaha Road, mauka of Mahinau Road, is preferred and will be used unless archaeological issues prevent this from occurring. No other existing roads will need upgrading.
- Activation of the WCEAR cannot be planned, as it was designed to provide access during emergency situations. However, members of the Operational Plan Team will be consulted regarding the notification of the Navy in the procedure plan when Luahalei Naval Road is activated as a bypass route.
- A Nanakuli resident was reported to have found ordinance makai of the OR&L Railroad tracks, however, in their letter dated January 16, 2002, the Department of the Army did not mention any concerns regarding ordinance in Nanakuli. Additionally, the subsurface trenching conducted as a part of our archaeological field studies did not reveal any ordinance.
- There are no plans to improve Paakea Road, other than the proposed extension to Luahalei Naval Road. The standard specifications for roads included in the WCEAR included 24-foot of pavement and 8-13 feet of shoulder area. Roads must be able to accommodate City Bus traffic and permanently open roads would have overhead lighting. Paakea Road currently accommodates bus traffic and meets the rest of the requirements for inclusion in the WCEAR. Therefore, no improvements are proposed.

Commander Sommer
April 5, 2002
Page 2

- The WCEAR does not include a route through Kolekole Pass. However, should any of the Nanakuli segments be impassable due to a large-scale event, the Operational Plan notes that the only other possible route would be through Kolekole Pass. Section 2.3.2.F of the Draft EA states that "The Kolekole Pass option is not an official part of the WCEAR and its use is solely up to the discretion of the U.S. Navy."

- The botanical survey concentrated on those areas that would be impacted by construction activities. Impacts to other areas not proposed for construction should be minimal due to the sporadic use of the WCEAR. Permanent status of Paakea Road is not expected to significantly increase traffic because that area lacks facilities and structures and because the new road does not offer any time or distance savings over Farrington Highway. The 'ihii'ihii (*Marsilea villosa*) mentioned is located on a property adjacent to a road included in the WCEAR routing, but not requiring construction.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. The City is looking forward to continuing their dialogue with the HFD in developing an effective emergency road. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,



Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

February 22, 2002

Townscape, Inc.
900 Fort Street Mall Suite 1160
Honolulu, HI 96813

Mr. Bruce Tsuchida

As landowners and life time residents of Mahinaau Rd. in Wa'iana'e, we oppose the use of Mahinaau Rd. as part of the Wa'iana'e community emergency access road.

Your self-proclaimed use of the term WCEAR clearly states that it is an "emergency access road", however you fail to agree to the wishes of the very people who live on Mahinaau. As landowners we have never agreed to the use of Mahinaau Rd. and in fact made it very clear from the beginning and on several occasions that we oppose the use of the road. Furthermore the use of any "emergency access road" should be limited to "emergencies only". You have failed to hear the protests of those directly impacted by the use of a permanent road either on Mahinaau or Kaulawaha.

There is no justice in your system. Time and again a member of this family has gone to every meeting to object to the use of Mahinaau as well as, making a "emergency access road" into a permanent road. On every occasion we have been met with half-baked attempts to minimize our concerns and feeble attempts to rewrite the facts. For the record, Dave Bills has on every occasion misrepresented factual information regarding what occurred in the smaller community/ahapua'a meetings.

Politics appears to be the priority. In spite of Mr. Bills statements that affected landowners and residents would be contacted, this has never happened. The three landowners that currently reside on this road were never given any indication that their opinions or concerns were even heard.

Clearly we oppose the use of Mahinaau Road and will never agree to the use of a permanent road either on Kaulawaha or Mahinaau. The use of overhead lighting, increased traffic and the danger it will present to the children and families who reside on this private road is our concern. This is our priority and know that it is in direct conflict with the cash cow that a permanent road will create for Greg, Hong, Bills & Nojima.

The use of Mahinaau will significantly negatively impact the quality of life generations of this family has worked many years for. Kaulawaha is the road that should be used for emergency access only. Cultural monitors with direct knowledge and awareness of this specific area should be used. Their direction and input if heeded will allow for Kaulawaha as an emergency access road without disturbing any burial or culturally significant sites. The late Maxine L.P. Hee, our mother was the President of the Wa'iana'e Hawaiian Civic Club for over 15 years and relied on the knowledge and insight of Koa Mana. She believed as we do, that Koa Mana knows this area better than anyone does.

Please be advised that this family and the families of Mahinaau want Kaulawaha used as the emergency access road. In the event of an unfortunate accident or emergency, Kaulawaha's access should be made to the community at large to assist in the flow of traffic.

Sincerely,

Colleen M. Hee
Colleen M. Hee

Lianne K. Hee
Lianne K. Hee

Shelley W. Hee
Shelley W. Hee

Wayfall K. Hee
Wayfall K. Hee

Jeffrey M. Goodman
Jeffrey M. Goodman

Jeffrey M. Goodman
Jeffrey M. Goodman

TOWNSCAPE, INC.

Environmental and Community Planning

900 Fort Street Mall, Suite 1160
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E-mail: townscape@java.net

March 6, 2002

The Hee and Goodman Ohana
85-259 Mahinau Road
Waianae, Hawaii 96792-2124

To Whom It May Concern:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- We acknowledge your resistance to the use of Mahinau Road in the WCEAR system and agree that Kaulawaha is the preferred alignment due to potential impacts on residents. Every effort will be made to use the Kaulawaha Road alignment.
- We apologize for your frustration with the process that was used to plan this Emergency Route. While we respect the opinions of the residents of Mahinau Road, we must also consider the welfare of the residents of the rest of the Waianae Coast. Every effort will be made to make Kaulawaha Road a feasible alignment, and under the guidance of cultural monitors, the City is relatively confident that this will occur. However, if for some reason it is not possible to use this alignment for the purposes of the WCEAR project, Mahinau Road is still considered as the only other alternative.

Without a bypass in this area, a traffic-disrupting event on Farrington Highway between Kaulawaha Road and Maituu Road will effectively lock Makaha residents in or out of their valley. In this event, motorists could use Mahinau Road as it presently exists as a bypass into and out of Makaha Valley. This will create a hazard, as motorists will be traveling on a relatively unimproved street. As a part of the WCEAR project, Mahinau Road would at least be improved to accommodate the traffic that would otherwise use this route. Again, we stress that this scenario is not preferred, and would only occur if all efforts to use Kaulawaha Road fail.

- Many community members have expressed their concern over the use status of the Makaha section of the WCEAR. Your views on the Emergency Use status of the proposed bypass are being evaluated and balanced with the opinions of other residents who prefer a permanently open road to alleviate traffic on Farrington Highway, as well as to offer a shorter, safer route between Makaha Valley and Kamalle Elementary School. The decision on the status will be made in the final design stage.

The Hee-Goodman Ohana
March 6, 2002
Page 2

- The City will seek the advice of cultural monitors during the design and construction of the final alignment. Koa Mana has already been preliminarily contacted regarding general issues in this area. The City will continue to consult with Koa Mana in order to identify the best possible alignment and procedures for implementation of the project. Any additional recommendations that will help to select the appropriate person(s) for this task will be greatly appreciated.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,



Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

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April 5, 2002

The Robinson 'Ohana
c/o Lianne Hee
85-259 Mahinau Road
Waianae, Hawaii 96792-2124

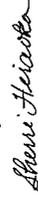
To Whom It May Concern:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- We acknowledge your resistance to the use of Mahinau Road in the WCEAR system and agree that Kaulawaha is the preferred alignment due to potential impacts on residents. Every effort will be made to use the Kaulawaha Road alignment.
- Many community members have expressed their concern over the use status of the Makaha section of the WCEAR. Your views on the Emergency Use status of the proposed bypass are being evaluated and balanced with the opinions of other residents who prefer a permanently open road to alleviate traffic on Farrington Highway, as well as to offer a shorter, safer route between Makaha Valley and Kamaile Elementary School. The decision on the status will be made in the final design stage.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,


Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

February 22, 2002

Mr. Bruce Tsuchida
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, HI 96813

Mr. Tsuchida:

We oppose the use of Mahinau Rd. as an emergency access road. We believe the best alternative is the use of Kaulawaha Rd. because it does not pass any homes. We have very young children and large families on this road and feel it would be dangerous to our children and families.

We believe the emergency access road should be used for emergencies only and not kept open for permanent use.

Sincerely, 

James Robinson and 'Ohana

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Environmental and Community Planning

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E-mail: townscap@lava.net

April 4, 2002

Mr. Adam and Ms. Ella Florence
c/o Lianne Hee
85-259 Mahinau Road
Waianae, Hawaii 96792-2124

Dear Mr. and Ms. Florence:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- We acknowledge your resistance to the use of Mahinau Road in the WCEAR system and agree that Kaulawaha Road is the preferred alignment due to potential impacts on residents. Every effort will be made to use the Kaulawaha Road alignment.
- The City will seek the advice of cultural monitors during the design and construction of the final alignment. Any recommendations that will help to select the appropriate person(s) for this task will be greatly appreciated.
- Contact with individual landowners will occur during the final design stage to discuss specific details regarding their properties.
- Many community members have expressed their concern over the use status of the Makaha section of the WCEAR. The final decision on the status will be made in the final design stage.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka
Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

February 22, 2002

Mr. Bruce Tsuchida
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, HI 96813

Dear Mr. Tsuchida:

As land owners and long time residents of Mahinau Rd. We oppose the use of Mahinau as an emergency access road or permanent access road. We believe Kaulawaha should be used. The use of Kaulawaha will keep traffic off of our residential road. Kaulawaha is currently not being used and has no homes or structures along its path. This is the safest and sensible alternative.

Please be advised that appropriate cultural monitors who are knowledgeable in this area can advise a pathway that will allow for the use of Kaulawaha Rd. without the desecration of our ancestor's burial sites.

No one has ever contacted us or come by to wala'au to get our opinion. Let this state for the record, we do not want Mahinau Rd. used as the emergency access road and we do not believe the use of an emergency access road should be used permanently.

Sincerely,
Adam E. Florence
Ella A. Florence

Adam and Ella Florence

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Environmental and Community Planning

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Honolulu, Hawaii 96813

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March 6, 2002

Kaneko Nahulu
c/o Lianne Hee
85-259 Mahinau Road
Waianae, Hawaii 96792-2124

Dear Kaneko Nahulu:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- We acknowledge your resistance to the use of Mahinau Road in the WCEAR system and agree that Kaulawaha is the preferred alignment due to potential impacts on residents. Every effort will be made to use the Kaulawaha Road alignment.
- Many community members have expressed their concern over the use status of the Makaha section of the WCEAR. Your views on the Emergency Use status of the proposed bypass are being evaluated and balanced with the opinions of other residents who prefer a permanently open road to alleviate traffic on Farrington Highway, as well as to offer a shorter, safer route between Makaha Valley and Kamaile Elementary School. The decision on the status will be made in the final design stage.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,



Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

February 22, 2002

Mr. Bruce Tsuchida
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, HI 96813

Mr. Tsuchida:

We oppose the use of Mahinau Rd. as an emergency access road. We believe the best alternative is the use of Kaulawaha Rd. because it does not pass any homes. We have very young children and large families on this road and feel it would be dangerous to our children and families.

We believe the emergency access road should be used for emergencies only and not kept open for permanent use.

Sincerely,



DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU

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DEPUTY DIRECTOR
GEORGE T. TAMASHIRO
ASSISTANT DIRECTOR
CDEP 02-0047

February 22, 2002

Ms. Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

Subject: Draft Environmental Assessment (EA)
Proposed City and County of Honolulu
Waianae Coast Emergency Access Road

We have reviewed the Draft EA and have the following comments:

Civil Division:

In general, the cost estimates on pp. 41-43, Table 2-2 for the various road segments appear to be appropriate.

However, costs for the bridges seem low. We consider the \$1,000,000 estimate for bridge work on the Nanakuli Makai Roadway to be low and a better estimate should be obtained from the engineering consultant. There also should be an estimate for the demolition of the existing bridge. Are there any channel work to take care of scour? The \$750,000 estimates for bridge constructions at Paakea Road Extension and Kaulawaha Road Improvements to Mahiama Road also appear low and should be reevaluated.

A separate discussion on land acquisition costs should be included since negotiations to acquire land could significantly delay construction of the project.

If there are any questions, please contact Gregory Sue at 527-6304.

Ms. Sherri Hiraoka
Page 2
February 22, 2002

Facilities Division:

The proposed route will result in the loss of land adjacent and makai of the railroad right-of-way in Nanakuli Beach Park between Launania Avenue and Nanakuli Avenue. However, the loss will probably have minimal impact on the park.

If there are any questions, please call Donald Griffin at 527-6324.

Mechanical/Electrical Division:

Have any possible permitting requirements been addressed and resolved on the installation of street lights on the emergency access road?

If there are any questions, please call Gerald Hamada at 527-5002.

Wastewater Division:

Our comment is in regards to the increase in traffic anticipated on those permanently opened roads and emergency-only access roads. The structural impacts due to additional dynamic and static loading should be accounted for and its effect on the sewer lines beneath the project areas evaluated, in addition to the 4-foot covering requirement and extension of sewer manhole sleeves. This concern stems from the soils information that stated fill material had been found in some areas. Additional loading may cause shifting, thereby affecting sewer alignment.

We note that the Department of Environmental Services and Facility Maintenance were not contacted during the preparation of the Draft EA.

Should you have any questions, please feel free to contact Cheryl Kaneshiro Takeuchi at 523-4551.

Please note the following comments:

p. 2, Section 1.2, 3rd paragraph, 1st sentence

Revise "Paakea Street" to "Paakea Road" and "Kaulawaha extension" to "Kaulawaha Road extension".

Ms. Sherri Hiraoka
Page 3
February 22, 2002

p. 2, Section 1.2, 4th paragraph, 4th sentence

Revise "...allowing the private owner maintains ownership" to "...allowing the private owner to maintain ownership".

p. 4, Key Map

Correct "Paakea Street" to "Paakea Road".

p. 8, Figure 2-1

The dimension from the edge of pavement to the overhead street light pole should be given. Show cross slopes. Are there any swale sections?

p. 9, Table 2-1

Bridges need to satisfy scour and seismic requirements. Scour considerations may require additional construction costs.

p. 11, Figure 2-2

Show Nanakuli Stream to ocean.

p. 15, Figure 2-4

Show Ulehawa Stream on map.

p. 19, Figure 2-6

Show Kaulawaka Road and where new road ends on map.

p. 22, Figure 2-7

Show East Makaha Stream on map.

p. 24, Section 2.2.7, 2nd paragraph

The cost figures for the Kaulawaha Road Improvements and the Mahinau Road/Mainui Road alternative should reflect their slight differences. We suggest stating the estimate for Kaulawaha Road Improvements at \$1.95 million. This would be consistent with your discussion on p. 40, Section 2.4 where a difference between the alternatives is noted.

Ms. Sherri Hiraoka
Page 4
February 22, 2002

p. 37, Section 2.3.2

The Department of Facility Maintenance should be included in the meetings due to expected vandalism and dumping problems.

p. 65, Section 3.7.4

Paakea Road is privately owned except for the portion over Mailili Stream and its approaches.

Appendix A, Preliminary Engineering Drawings, Sheet 2

A bridge with 200-foot span needs piers. The existing pedestrian bridge is 2 spans at 45 feet each. On the profile, is the proposed improvements under the new bridge the channel lining?

Appendix A, Preliminary Engineering Drawings, Sheet 27

Label Ulehawa Stream on the plan and show direction of stream flow.

Thank you for the opportunity to comment.

Very truly yours,


RAE M. LOUI, P.E.
Director

GS:dk

cc: Department of Transportation Services-Michael Oshiro

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS
MAYOR

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DIRECTOR
ERIC G. CRISPIN, AIA
DEPUTY DIRECTOR
GEORGE T. TAMASHIRO
ASSISTANT DIRECTOR
CDEP 02-0058

March 1, 2002

Ms. Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

Subject: Draft Environmental Assessment (EA)
Proposed City and County of Honolulu
Waianae Coast Emergency Access Road

We wish to amend our February 22, 2002 comments on the above draft EA with the following paragraph to be inserted before the last sentence under the Civil Division comments:

In Section 6 Permits Required, there should be an expanded discussion on the impacts a Section 404 permit, a 401 Certification and a Stream Channel Alteration Permit will have on the design and construction of the roadway improvements. There is a likelihood of lengthy delays in processing these permits in the event they were to be required.

If there are any questions, please contact Gregory Sue at 527-6304.

Very truly yours,

A handwritten signature in black ink, appearing to read "Rae M. Loui".

RAE M. LOUI, P.E.
Director

GS:dk

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Environmental and Community Planning

900 Fort Street Mall, Suite 1160
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April 5, 2002

Ms. Rae M. Loui, P.E.
The Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96913

Dear Ms. Loui:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

Civil Division

- Discussion on Revised Cost Estimates for Bridges.
The project civil engineer provided the cost estimate information. Changes to the costs in the FEA are being evaluated.
- Discussion on Land Acquisition Costs.
The majority of the land acquisition is in existing roadway lots or easements and preliminary landowner discussions have occurred. The area of roadway with the most individual landowners is the last area subject to design and construction. The property maps shown in Appendix A have been turned over the DDC land Division.
- Specific land acquisition costs will be discussed with each landowner in the final design stages. Expected costs include a nominal transfer fee for park lands and existing roadway lots and a \$2 per square foot cost for agricultural lands.

Facilities Division

- Thank you for your confirmation of our assessment that there will be minimal impact on Nanakuli Beach Park due to the loss of land.

Mechanical/Electrical Division

- Only new roads that will be permanently open to the public will have streetlights. Currently, only one road is confirmed as a permanently accessible roadway: the Paakea Road extension. The Nanakuli Makai, Heleluia Place Extension and the Pakeke Street to Hakimo Road Connector are all designated as "Emergency Use" Only and will not have street lighting installed. The use status of the final two roadway segments, the Mahinau Road Extension and the Kaulawaha Road Improvement, have not yet been determined.

Ms. Loui
April 5, 2002
Page 2

Wastewater Division

- Fill materials were only found in the Nanakuli makai portion of the WCEAR, makai of the OR&L Railroad Tracks. This roadway segment is a proposed for "Emergency Use" only and will therefore not be subject to constant weight loads.
- The Department of Facility Maintenance has provided a comment letter in response to the Draft Environmental Assessment (EA). No concerns were raised on this subject.

General Comments

- Improper street names and titles will be corrected in the Final EA.
- Grammatical errors will be corrected in the Final EA.
- Maps will be amended to display streams in the Final EA.
- Both the existing and improved sections of Kaulawaha Road are shown in Figure 2-7. The new road is identified by the bold line marked "Kaulawaha Road Improvement."
- Cost estimates in Section 2.2 will be rounded to the hundredths place instead of the tenths place to better express the differences between the alternatives in the Kaulawaha Road section.
- It is not clear what meetings you state the Department of Facility Maintenance should be included in on page four of your letter. All City Departments were invited to attend the General Community Meetings periodically held in Waianae since November 2000. The last such meeting was held on February 13, 2002.

The Operational Plan Team consists of representatives from City Departments that will be directly involved in the activation of the WCEAR upon the occurrence of a traffic-disrupting incident. The Department of Facility Maintenance was not determined to have a direct role in opening emergency roads and rerouting traffic, and was therefore not included in these meetings.

The Department of Facility Maintenance has provided a letter in response to the Draft EA and has expressed concern over vandalism and dumping. The Department recommended permanent access on all roads to reduce the potential for dumping. As was stated to the Department of Facility Maintenance, permanent status was considered for every roadway in the proposed WCEAR project. However, the planning process revealed community opposition to permanent status for particular road segments due to concerns over child safety, continuation of neighborhood quality of life and access to archaeologically sensitive sites. The community also felt that dumping would actually increase if roads

Ms. Loui
April 5, 2002
Page 3

were permanently open. The City determined that these community concerns outweighed the arguments for permanent status for all roadways. Therefore, while we appreciated the concern, we respectfully declined implementing the suggestion for permanent vehicular access on all proposed new roadways.

- Road Ownership will be amended in the Final EA to reflect the private ownership of Paakea Road.

Discussion on Nanakuli Makai Bridge Plans

- The engineering diagram will be revised to clarify your comments.
- Ulehawa Stream and the direction of its streamflow will be included in the figures.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,


Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

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Environmental and Community Planning

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Honolulu, Hawaii 96813

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E-mail: townscap@lava.net

April 5, 2002

Mr. Ben Schlapak
Hawaiian Railway Society
1545 Molina Street
Honolulu, Hawaii 96818

Dear Mr. Schlapak:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- Thank you for the example of pre-cast concrete railroad crossings you provided. Their use will be considered and implemented for the Nanakuli Avenue crossing of the OR&L Railroad.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. The City is looking forward to continuing their dialogue with the HFD in developing an effective emergency road. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,

Sherri Hiraoka

Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

Memo To: Townscape, Inc
Fax 524 4998

Subject: Draft E.A., Waianae Coast
Emergency Access Roads

We have reviewed the document and appreciate the consideration given HRS and the historic OR&L track.

We have sent CHBNA an example of pre-cast concrete railroad crossings which have been used elsewhere in the vicinity of Kabe Point, Trunks Beach, Kalahele Blvd, etc. We think this approach has application at the Nanakuli Ave. RR Crossing.

Ben Schlapak 838 8821
HRS

26 Feb. 02

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS
MAYOR

RANDALL K. FUJIMI, MA
DIRECTOR
LORETTA A.C. CHEE
DEPUTY DIRECTOR

2002/TELOG-89 (TH)

February 27, 2002

Ms. Sherri Hiraoka
Staff Planner
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

Draft Environmental Assessment for the
Waianae Coast Emergency Access Road, Oahu, Hawaii

We have reviewed the Draft Environmental Assessment (DEA) and offer the following comments in addition to our earlier comments of August 31, 2001.

1. Section 3.7 of the DEA only discusses the State land use districts, County zoning districts, Shoreline Management Area (SMA), and overall land ownership that are affected by the proposed project. A discussion about the relationship of the proposed project to relevant County land use plans and policies should also be mentioned. Therefore, we recommend that Section 3.7 of the final EA be expanded to include the information provided below regarding the City's General Plan, Oahu Metropolitan Planning Organization's 2025 Oahu Regional Transportation Plan, *Waianae Sustainable Communities Plan*, and the *Waianae Public Infrastructure Map (PIM)*.

The proposed project is consistent with and supports the General Plan objectives and policies pertaining to Transportation and Utilities and Public Safety. Transportation and Utilities Objective A, Policy 5 call for creating a safe and efficient transportation system by improving roads in existing communities to reduce congestion and eliminate unsafe conditions. Public Safety, Objective B, policies 6 and 11 call for protecting people and property from natural disasters and other emergencies by reducing hazardous traffic conditions, and developing civil defense plans and programs to protect and promote public health, safety and welfare of the people.

Additionally, the proposed project is included in the City Department of Transportation's six-year Capital Improvement Program budget, and the Oahu Metropolitan Planning Organization's 2025 Oahu Regional Transportation Plan.

Ms. Sheri Hiraoka
Townscape, Inc.
February 27, 2002
Page 2

The proposed project is consistent with the *Waianae Sustainable Communities Plan* that was adopted by Ordinance 00-14 on May 10, 2000. For instance, the process to determine the preferred alignment conforms to *Waianae's* long-range vision that is built on the community's cultural values and rural qualities.

The proposed project is also consistent with Section 4.1.2.3 of the *Waianae Sustainable Communities Plan* that discusses the need for an "Emergency Road or Emergency Access/Egress route" which states:

"There is a need to establish an Emergency Road or Emergency Access/Egress route that can be used as an alternate to Farrington Highway for those times when one or more sections of Farrington Highway may be impassable due to storm damage, a severe vehicular accident, or some other cause. An emergency route may include sections of private roads, which would require special provisions for public use in times of emergency."

The proposed project is consistent with the *Waianae PIM*. Last year, the Department of Planning and Permitting processed a revision to the *Waianae PIM* to add a publicly funded collector roadway symbol for an emergency alternate transportation route from *Nanakuli to Makaha*. The revision was adopted by Resolution 01-112 on May 30, 2001. Resolution 01-112 satisfies the *PIM* requirement mentioned in Section 6.3 of the *DEA*.

2. The "Nanakuli makai road improvements" listed in Table 2-1 and shown on Figure 3-2 are within the Special Management Area (SMA). Based on the cost of the project, a major SMA use permit will be required. Other segments of the proposed emergency road do not appear to be within the SMA.

3. Substandard roadways should be designed to meet current City standards to the greatest extent practical, especially those roadways that involve subdivisions affecting or creating roadway lots. Roadway design elements that may not meet current City design criteria, that may include horizontal or vertical curves and provisions for adequate vehicular sight distances should be identified during the design of the roadways. Appropriate measures, such as roadway reconstruction and signing, should be incorporated into the design plans.

Ms. Sheri Hiraoka
Townscape, Inc.
February 27, 2002
Page 3

Thank you for the opportunity to comment on this matter. Should you have any questions, please contact Tim Hata of our staff at 527-6070.

Sincerely yours,



RANDALL K. FUJIKI, AIA
Director of Planning & Permitting

RKF:js

cc: Department of Transportation Services
Attn: Mike Oshiro

g:/Planning/Div Function/eis/2002/elog-89.doc

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April 5, 2002

Mr. Randall K. Fujiki, Director
City and County of Honolulu
Department of Planning and Permitting
650 S. King Street
Honolulu, Hawaii 96813

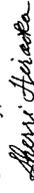
Dear Mr. Fujiki:

Thank you for your letter regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and hope that you will find the following response to your comments satisfactory.

- Thank you for the information regarding the General Plan, the Oahu Metropolitan Planning Organization, the Waianae Sustainable Communities Plan and the Public Infrastructure Map. The Final EA will reflect the additional information you have provided.
- Thank you for confirming the need for a Special Management Area Permit. The appropriate permits and approvals will be obtained when necessary.
- Existing roadways included in the WCEAR are all capable of handling standard City bus traffic with the exception of Mahinau Road. If the Mahinau Road alternative is selected, improvements will be required. All new roadways included in the WCEAR will meet City and County Agricultural Roadway Standards. This standard was selected because proposed permanently open roads are located within City and County zoning districts defined as Country Zoning, Agricultural Zoning or Preservation Zoning. Those roads not within these zoning designations are proposed to be for "Emergency Use Only."

Your letter will be included in the Final EA document, which will be amended to reflect your comments. The City is looking forward to continuing their dialogue with the HFD in developing an effective emergency road. If you have any additional questions or comments regarding this project, please call Sherri Hiraoka at 536-6999, extension 104.

Sincerely,



Sherri Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
801 KAMOKILA BLVD., ROOM 566
KAPOLEI, HAWAII 96707

January 28, 2002

Ms. Sherri Hiraoka, Staff Planner
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

SUBJECT: Chapter 06E-8 Historic Preservation Review of a Draft Environmental Assessment (DEA) for the Proposed City and County of Honolulu Waianae Coast Emergency Access Road
Nanakuli, Luahualei/Maui, Wai'anae & Makaha, Wai'anae, O'ahu
TMKs: Portions of (1)-8-4-019: 001, 020-027; 8-4-020: 001-003; 8-5-002: 016, 022-025, -037, -038 & -040; 8-5-003: 030, -036; 8-5-006: 010; 8-7-008: 076 & -077; 8-7-010: 002 & 020; 8-7-019: 001, 011, 046 & 054; 8-7-021: 001, 035; 8-7-037; 045; 8-9-001: 002

We provide comment on the DEA for the proposed Waianae Coast Emergency Access Road (WCEAR) which we received on January 7, 2002. This road is to be constructed on various developed and undeveloped lands in the vicinity of Farrington Highway in Wai'anae District on O'ahu. We understand the concern for completion of such a road. There are six roadway segments proposed for physical improvement to allow implementation of the WCEAR Plan: (1) Nanakuli Makai; (2) Helelua Place Extension to Luahualei Naval Road; (3) Paakea Road improvements (Hakimo Road/Luahualei Naval Road Connector); (4) Paakea Street/Hakimo Road Connector; (5) Mahinaau Road extension (to Ala Hema Street/Plantation Road); Kaulawaha Road improvements (Makaha Valley Road to Mahinaau road).

We have not completed our review of the archaeological survey, supplemental report, and the traditional and cultural practices assessment; our review comments on those documents will be submitted under separate cover. We strongly urge that you wait until we complete this review, particularly as we have concerns whether all historic sites have been found in the Mahinaau/Kaulawaha road section.

Here, however, we are providing some initial comments on the findings and recommendations in the Draft EA.

1. To date three historic sites have been identified. Two historic sites were found in the survey for this project within the proposed Kaulawaha Road Extension area: State Sites 50-80-07-5949 (traditional Hawaiian habitation with an associated human burial) and 5950 (a portion of a sugar plantation camp and pumping station, probably dating to the late 1890s and early 1900s). The other identified historic site is the OR & L Railroad (State Site No.

Ms. Sherri Hiraoka, Staff Planner
Page Two

50-80-12-9714), which is within the Nanakuli Makai corridor. We are concerned that more significant historic sites are possibly within the Kaulawaha Road corridor. The heiau Kane I Ka Pualena Complex looms over this area. Also, Mahele land records show that taro marshlands were extensive in this area with habitations just behind at the base of Kamaile 'unu Ridge (Cordy 2001. *Life in 1820-1850 in Kamaile 'Ili, Wai'anae Ahihihihi*: A *Review of the Mahele Records*. Manuscript on file, SHPD Library, Kapolei.). This would indicate that either extensive taro soils (a historic site with significant information) or habitation deposits (quite possibly with associated subsurface burials) could be present along much of the entire length of this road. Until we review the survey report, we will not be sure that the identification of sites is complete.

2. Of the three known historic sites, all are significant. Sites 5949 and 5950 were deemed significant under multiple criteria, and determined to be eligible for placement on the Hawai'i and National Registers of Historic Places. The OR & L Railroad (State Site No. 50-80-12-9714) is on the National Register of Historic Places.

3. We are concerned with the impacts of the project on the OR & L Railroad and on the known sites and perhaps still undiscovered sites along the proposed Kaulawaha Road Extension.

- a. We are concerned about the possibility of an "adverse effect" on the OR & L Railroad in the Nanakuli Makai corridor. The DEA does not provide clear information on the proposed activities in the vicinity of Site -9714, or how they might be conducted so as to avoid "adverse effect" on the OR & L Railroad. This might be important in the light of some proposals to have the tracks and train operating again. We do agree that archaeological monitoring of excavations along the Nanakuli Makai corridor is warranted, in case some archaeological sites might survive (remnant habitation deposits or burials).
b. We agree sites 5949 and 5950 along the Kaulawaha Road Extension would be "adversely effected." But again, we are not sure that the survey has acceptably documented whether other sites exist along the Kaulawaha Road Extension. So it is premature to agree on needed mitigation. If Sites 5949 and -5950 are the only two sites, then a program of mitigation (including archaeological data recovery, burial treatment, and archaeological monitoring) might be feasible. While you have indicated that the Kaulawaha Road Extension may be realigned so as to avoid the area of Site 5949, the possibility of other sites would still have to be addressed (with additional survey).

In sum, we cannot concur at this time with your finding of "no significant impact" to historic and cultural sites until the above issues for the Nanakuli Makai and Kaulawaha Road corridors are resolved. Part of this resolution will be addressed in our soon-to-be completed review of the archaeological survey and the traditional and cultural practices assessment for this project.

Ms. Sherri Hiraoka, Staff Planner
Page Three

ATTACHMENT I: COMMENTS ON DRAFT EA FOR
THE PROPOSED WAIANAË COAST EMERGENCY ACCESS ROAD

Section 3.2 Archaeological, Historical and Cultural Sites

Page 46, Methodology: The last sentence is inaccurate and should be re-phrased as follows (suggested new language underlined): "The results of these investigations could be used to evaluate the significance of the identified sites, and determine their eligibility for placement on the National and State Registers of Historic Places."

Section 3.4 Cultural Resources

Page 54, Religious Sites: According to our records, McAllister reported that Kane I Ka Pualena Heiau (State Site No. 50-80-07-160) was completely destroyed by 1930, and "all the stones have been moved." Judging from McAllister's (1933) maps, which have generally proved accurate, Kane I Ka Pualena Heiau actually lay to the south of the project area. We attach a map showing several of McAllister's site locations (signified by the "OW" numbers). As can be seen, Kane I Ka Pualena Heiau (Site -160 or "OW9") was probably situated in the vicinity of the modern-day Kamaile Elementary School.

Section 7. Findings and Determination

Page 85, Item 1: We strongly disagree with the mitigation methods proposed here. You have already noted elsewhere, and your archaeological consultant has recommended, that additional archaeological work - including data recovery and monitoring - will be needed in the existing Kaulawaha Road Extension area. A cultural monitor cannot be substituted for a qualified archaeological monitor, as the second to the last sentence here implies. All archaeological mitigation, including data recovery and on-site monitoring of ground disturbance, must be carried out by qualified archaeologists. If you or the community wish to have a cultural monitor, you will have to make those arrangements separately.

Last, we note that there seems to be some confusion over the roles of archaeological and cultural monitors. When we recommend that archaeological work - survey, data recovery, or monitoring - should be carried out, it is to be performed by qualified archaeologists, usually under an approved plan or scope of work. While we recognize the contributions that a cultural monitor makes to a project, the historic preservation laws do not address such monitors. Thus, our office does not have any expressed authority to regulate cultural monitoring nor can we require it; there is no statutory authority for our office to do so. Please understand that a cultural monitor is not a substitute for an archaeological monitor, when archaeological monitoring has been recommended. The cultural monitor performs other tasks, primarily concerning liaison with the local community and cultural protocol when sensitive findings, especially burials, occur.

In summary, we have some serious concerns over the potential "adverse effect" that two portions of the proposed WCEAR may have on significant historic sites. Given the importance of this project, we look forward to working with your company, the community and the City & County to resolve these matters and have this project go forward. We will complete the archaeological survey and traditional and cultural practices assessment review as soon as possible. If route corridors change, we would like to request that our office be provided with this information at the earliest opportunity, so we can all address historic preservation concerns in a timely fashion.

We have provided some additional, detailed comments for your use and consideration in Attachment I. Should you have any questions about archaeology, please feel free to contact Sara Collins at 692-8026. Should you have any questions about the OR & L Railroad, please feel free to contact Nathan Napoka at 587-0040. Should you have any questions about burial matters, please feel free to contact Kai Markell at 587-0008.

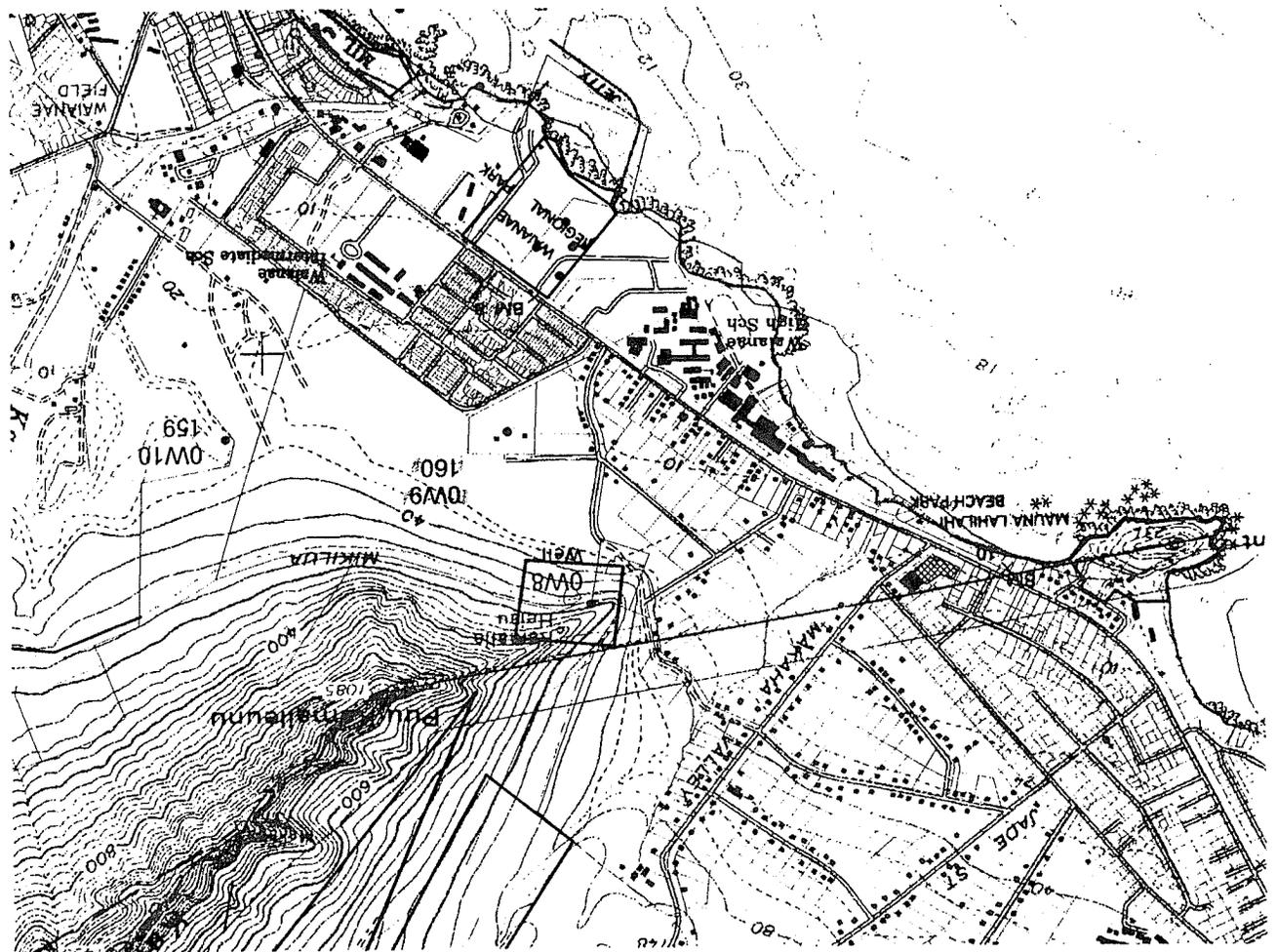
Aloha,



Don Hibbard, Administrator
State Historic Preservation Division

SC:jk

c: Mr. A. Van Horn Diamond, Chair, O'ahu Island Burial Council
Mr. Kai Markell, Burial Sites Program



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BOJAMIN J. CAVETANG
GOVERNOR OF HAWAII



DEPUTY
ERIC T. HEMAO
UNEL WINGOLA
GILBERT COLMAN AGABRIAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

7502.007

- AQUACULTURE DEVELOPMENT PROGRAM
- AQUATIC RESOURCES CONSERVATION AND ENVIRONMENTAL AFFAIRS
- CONSERVATION AND RESOURCES ENFORCEMENT
- CONVEYANCE
- FORESTRY AND WILDLIFE RECREATION DIVISION
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- STATE PARKS
- WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
801 KAPOLU AVENUE, ROOM 666
KAPOLU, HAWAII 96761

February 26, 2002

Ms. Cheryl Soon, Director
Department of Transportation Services
City and County of Honolulu
Pacific Park Plaza, 711
Kapiolani Boulevard, Suite 1200
Honolulu, Hawaii 96813

LOG NO: 29213 ✓
DOC NO: 0202SC18

Dear Ms. Soon:

SUBJECT: Chapter 6E-8 Historic Preservation Reviews of Reports Documenting an Archaeological Inventory Survey and a Traditional and Cultural Practices Assessment for the Proposed Waianae Coast Emergency Access Road Project

Nanakuli, Luahualei/Maui, Wai'anae & Makaha, Wai'anae, O'ahu
TMKs: Portions of (1)-8-4-019; 001, 020-027; 8-4-020: 001-003; 8-5-002: 016, 022-025, -037, -038 & -040; 8-5-003: 030, -036; 8-5-006: 010; 8-7-008: 076 & -077; 8-7-010: 002 & 020; 8-7-019: 001, 011, 046 & 054; 8-7-021: 001, 035; 8-7-037: 045; 8-9-001: 002

Thank you for the submission of reports documenting the results of an archaeological inventory survey (Elmore & Kennedy, 2001. *An Archaeological Survey Report for the Waianae Coast Emergency Access Road, Waianae District, Island of O'ahu ...* ACP ms.) and an assessment of traditional and cultural practices (McGuire & Hammatt, 2001. *A Traditional and Cultural Practices Assessment for Portions of the Proposed Waianae Coast Emergency Access Road at Nanakuli, Luahualei, Maui, Waianae, and Makaha, Waianae District, Island of Oahu*. Cultural Surveys Hawaii ms.). We received the subject reports on February 1, 2002. Staff members on our Archaeology Branch, and Cultural and History Branch have reviewed these reports and provide the following comments.

COMMENTS ON ARCHAEOLOGICAL INVENTORY SURVEY

We have recently separately commented on this survey report. The survey identified three historic sites within the project area through a program of surface survey and subsurface testing. A total of 36 backhoe trenches were excavated during the inventory

Ms. Cheryl Soon, Director
Page Two

survey: 34 trenches in the Nanakuli Makai corridor of the roadway and 2 trenches in the Kaulawaha Road corridor. Two historic sites were found in the survey for this project within the proposed Kaulawaha Road Extension area: State Sites 50-80-07-5949 (traditional Hawaiian habitation with an associated human burial) and 5950 (a portion of a sugar plantation camp and pumping station, probably dating to the late 1890s and early 1900s). Due to the discovery of a human burial in Trench 35, no further work was conducted in this segment of the project area. The other, previously identified historic site is the OR & L Railroad (State Site No. 50-80-12-9714), which is within the Nanakuli Makai corridor of the roadway project.

We do not believe that the archaeological inventory survey has adequately covered all portions of the project area within the Kaulawaha Road Extension. Mahele land records show that taro marshlands were extensive in this area with habitations just behind at the base of Kamaile 'unu Ridge. This would indicate that either extensive taro soils (a historic site with significant information) or habitation deposits (quite possibly with associated subsurface burials) could be present along much of the entire length of this road. We recommend that use of the existing Mahinaau Road be considered as an alternate route.

With regard to the proposed mitigation measures for the identified, significant historic sites, we have some additional concerns. We are concerned about the impacts of the project on the OR & L Railroad and on the known sites and perhaps still undiscovered sites along the proposed Kaulawaha Road Extension. Consequently, we suggest a meeting with your staff should these locations be selected.

COMMENTS ON STUDY OF TRADITIONAL AND CULTURAL PRACTICES ASSESMENT

As you may know, when reviewing traditional and cultural practices assessments, the Historic Preservation Division only has the authority to comment on those findings that have some bearing on the identification, evaluation, and treatment of historic properties as defined in Chapter 6E (HRS). This includes the identification of any traditions or practices that are associated with particular places or structural features and that therefore contribute to the property's significance. Historic properties with associated traditions and cultural practices are generally called traditional cultural properties. We also comment on the adequacy of the methods used to conduct and document the assessment because these approaches can determine whether all traditional cultural

Ms. Cheryl Soon, Director
Page Three

properties were likely to have been identified in the project area and if there is sufficient information to determine their significance and appropriate treatment.

We believe the methods used in conducting this cultural assessment were adequate and represent a good faith effort to identify and contact those individuals who could have cultural knowledge of the project area. The report adequately documents this consultation effort and its results and provides sufficient historical background to assess these findings within a historical context. We ask, however, that several revisions be made to the report's conclusion. The conclusions should specifically state whether or not any traditional cultural properties were identified in the project area and if any of the recommended actions will mitigate adverse effects on such properties. Based on the information presented, it appears that there is not sufficient information available on several potential properties to consider them traditional cultural properties. Also, the issues of burials and the OR & L railroad are raised both in the archaeological survey report and in the traditional and cultural assessment report. Discussion of these issues and the resulting recommendations should be integrated rectified if necessary, and presented in one or both reports.

We have provided some additional, detailed comments for your use and consideration in Attachment I. Should you have any questions concerning the traditional and cultural practices assessment, please feel free to contact Holly McEldowney at 692-8028. Should you have any questions about the OR & L Railroad, please feel free to contact Nathan Napoka at 587-0040. Should you have any questions about archaeology, please feel free to contact Sara Collins at 692-8026. Should you have any questions about burial matters, please feel free to contact Kai Markell at 587-0008.

Aloha,



Don Hibbard, Administrator
State Historic Preservation Division

SC:jk

c: Mr. A. Van Horn Diamond, Chair, O`ahu Island Burial Council
Mr. Kai Markell, Burial Sites Program

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ATTACHMENT I: COMMENTS ON
 ARCHAEOLOGICAL INVENTORY SURVEY FOR
 THE PROPOSED WAIANAE COAST EMERGENCY ACCESS ROAD
 ARCHAEOLOGICAL CONSULTANTS OF THE PACIFIC

ARCHAEOLOGICAL INVENTORY SURVEY

Section 3.4, Expected Finds

Page 27: For your information McAllister reported that Kane I Ka Pualena Heiau (State Site No. 50-80-07-160) was completely destroyed by 1930, and "all the stones have been moved." McAllister's (1933) maps, show Kane I Ka Pualena Heiau to the south of the project area. We attach a map showing several of McAllister's site locations (signified by the "OW" numbers). As can be seen, Kane I Ka Pualena Heiau (Site -160 or "0W9") is depicted in the vicinity of the modern-day Kamaile Elementary School.

Mahele land records show that taro marshlands were extensive in this area with habitations just behind at the base of Kamaile 'unu Ridge (Cordy 2001. *Life in 1820-1850 in Kamaile 'Ihi, Wai'anae Ahupua'a: A Review of the Mahele Records*. Manuscript on file, SHPD Library, Kapolei). This would indicate that either extensive taro soils (a historic site with significant information) or habitation deposits (quite possibly with associated subsurface burials) could be present along much of the entire length of Kauluwaha Road.

Section 7: Evaluations of Site Significance and Recommendations

Page 54: We are concerned about the possibility of an "adverse effect" on the OR & L Railroad in the Nanakuli Makai corridor. The DEA does not provide clear information on the proposed activities in the vicinity of Site -9714, or how they might be conducted so as to avoid "adverse effect" on the OR & L Railroad. This might be important in the light of some proposals to have the tracks and train operating again. We do agree that archaeological monitoring of excavations along the Nanakuli Makai corridor is warranted, in case some archaeological sites might survive (remnant habitation deposits or burials).

We also agree that sites 5949 and 5950 along the Kauluwaha Road Extension would be "adversely effected." We are not sure that the survey has acceptably documented whether other sites exist along the Kauluwaha Road Extension. So it is premature to agree on needed mitigation. While you have indicated that the Kauluwaha Road Extension may be realigned so as to avoid the area of Site 5949, the possibility of other sites would still have to be addressed before we could begin to consider mitigation proposals.

TRADITIONAL AND CULTURAL PRACTICES ASSESSMENT

IV (B): Recommendations

The report's summary and recommendations identifies a number of concerns raised by the individuals contacted and five measures that could mitigate these concerns (page 47). Two of the issues raised (#1, 4, and 5), that of burials and the O.R.&L. railroad track, are covered in our review of the archaeological inventory report. Two other

concerns (#1 and 3), those dealing with cultural monitoring and an opening blessing for the road, are not within our jurisdiction. Three remaining issues (#2 and 3) could involve traditional cultural properties in that they address potential adverse effects on a pu'u, a heiau, and a night marcher's route. In the case of the pu'u and the night marcher's route, there is apparently not enough information available to determine whether they are traditional cultural properties. For the pu'u, no specific traditions or practices seem to be associated with the pu'u other than its possible proximity to a heiau. As discussed in our review of the archaeological report, other information indicates that this heiau was not located near the pu'u. This conflicting information should be reconciled. Information on the night marcher's routes is not specific enough to tie this customary belief to a particular route or place. These possibilities should, however, be specifically addressed and evaluated in the report's conclusions.

TOWNSCAPE, INC.

Environmental and Community Planning

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Fax: (808) 524-4998
E-mail: townscape@lava.net

April 8, 2002

Mr. Don Hibbard, Administrator
The Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707

Dear Mr. Hibbard:

Thank you for your letters regarding the proposed Waianae Coast Emergency Access Road (WCEAR) project. We appreciate your interest in reviewing the Draft Environmental Assessment (EA) and the Archaeological and Cultural Reports and hope that you will find the following response to your comments satisfactory.

- Thank you for clarifying the roles of archaeological and cultural monitors. There was never any intention to substitute one for the other. In respect for the culturally-rich history of Waianae, a cultural monitor was proposed in addition to the need for an archaeological monitor, as recommended by the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD). The community has suggested that a cultural monitor may assist in final determination of the road alignment to lay out the route that is least likely to encounter archaeological sites. A qualified archaeologist will also be retained for any additional survey work as needed and to monitor construction activities in the Kaulawaha Road section, as well as the Nanakuli makai section, as recommended.
- Your concern regarding the potential for additional sites in the Kaulawaha Road Improvement area of the WCEAR is duly noted. Our project engineers are aware of this potential and will make every effort to avoid and/or minimally impact any identified and potentially identified sites. Additionally, if the Kaulawaha Road section is not feasible due to archaeological constraints, the City holds the option of using Mahinau Road as an alternate route through this area. Mahinau Road is currently not the preferred alignment due to potential impacts on the residents of that street.
- Regarding the presence of taro fields in the vicinity of the Kaulawaha Road segment, our consultants, Archaeological Consultants of the Pacific, Inc. (ACPI), cites literature that indicates that those fields lie makai of the proposed road. The alternate makai alignment for this area will utilize Mahinau Road, an existing road. Please see the attached letter from ACPI.

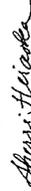
Mr. Hibbard
April 8, 2002
Page 2

• Upon publication of the draft Environmental Assessment, we have received additional consultation from members of the Hawaiian Railway Society (HRS) regarding the OR&L Railroad in Nanakuli. As previously mentioned, the Nanakuli makai roadway right-of-way (ROW) will not encroach into the railway ROW. There is also an existing railroad crossing that has already had moderate impacts on the area where the Nanakuli Makai segment will intersect with Nanakuli Avenue. This section of the WCEAR will be used for emergency use only, therefore restricting the amount of additional vehicles that cross the tracks. Additionally, upon the HRS's recommendation, the WCEAR will establish designated crossing points to maintain track integrity. Project engineers have already received examples of recommended pre-cast railroad crossings. Construction activities will be restricted to outside of the track ROW and continued consultation will occur between the City, HRS and the DLNR-SHPD.

- Your letter dated February 26, 2002 asked that the EA state whether or not any traditional cultural properties were identified in the project area. Our consultants, Cultural Surveys Hawaii (CSH) informed us that while there are no cultural practices associated with Piu Kamaili, it is a sensitive area for some community members, as it is tied to the Kane i ka Pualena Heiau in some family oral traditions. The actual route of the right marchers path is not known and cannot be determined with any certainty. Therefore, there is insufficient information available to determine whether these areas are "potential" traditional cultural properties. Please see the attached letter from CSH for more details.
- Continued consultation with the DLNR-SHPD and the community will occur to ensure proper procedures regarding archaeological concerns. The City will submit maps of any new realignment to the Kaulawaha Road improvement segment of the WCEAR project to the DLNR-SHPD for your review.

Your letter will be included in the Final EA document, which will be amended to reflect your comments. If you have any additional questions or comments regarding this project, please call Sherr Hiraoka at 536-6999, extension 104.

Sincerely,



Sherr Hiraoka
Staff Planner

cc: Michael Oshiro, Department of Transportation Services
David Bills, Gray, Hong, Bills, Nojima & Associates



ARCHAEOLOGICAL CONSULTANTS OF THE PACIFIC, INC.

JOSEPH KENNEDY
Principal Archaeologist

Dr. Sara Collins
O'ahu Archaeologist
Department of Land and Natural Resources
Historic Preservation Division
601 Kamokila Blvd. Room 555
Kapolei, Hawaii 96707
March 29th, 2002

Dear Dr. Collins:

Thank you for your review of our report *An Archaeological Survey Report for the Waianae Coast Emergency Access Road, Waianae District, Island of O'ahu*. This letter responds to yours of February 26th, 2002 to Ms. Cheryl Soon (LOG NO: 29213, DOC NO: 0202SC18).

Basically, you have expressed concerns on two issues. The first is our **Section 3-4. Expected Finds**. Here you provide information from Cordy's *Life in 1820-1850 in Kamale 'ili, Waianae Ahupua'a*, a manuscript on file at SHPD Library, Kapolei, regarding the presence of taro fields in the vicinity of the Kaulawaha section of the proposed road. First off, the ms. was not on file in the library when we did our background research; this not uncommon, a minor point, and is not in any way offered as an excuse or the basis for any sort of disagreement, but offered rather strictly as an informational point.

From other sources we were aware of the fact that taro was grown in this general vicinity and agree that some remnant deposits may still exist. We believe, however, that there is good reason to believe that these taro fields most likely lie *makai* of the proposed road and outside of our 40 foot APE. This can be supported by literature which describes the habitation area that was once at the foot of the ridge being located *behind* the taro fields. The physical attributes *makai* of the proposed road also supports this conclusion; the lands there being generally flatter and spring fed making them consistent with wet taro production. The proposed road APE runs through where the village, and later the plantation camp used to exist, which would be outside the taro area. Where the APE would move *makai* through the suspected taro fields, existing roads would be used.

59-624 Puupukea Road • Heleliwa, Hawaii 96712
Telephone: (808) 638-7442 • Fax: (808) 638-0703
E-mail: ArchaeologyPacific@mail.com or Kennedy@lewa.net

Inventory Surveys • Data Recovery Studies • Monitoring • Burial Treatment Plans • Historical Studies
Qualified Expert Witness Testimony • Preservation Plans • NAGPRA Studies • Traditional Cultural Property Studies

S. Collins
3-29-02
Page 2

Furthermore, it could be argued that our site 50-80-07-5949, the traditional Hawaiian habitation site with associated burial, may simply be expanded to include the taro fields as an associated feature located outside the APE. Kamale heiau and its associated cave and spring (although these have their own site numbers) may be considered in the same category and were treated in somewhat the same way without review comment in our report.

Ultimately however, we must agree with you that only addition testing within the APE can positively confirm our suspicions regarding the taro fields and other aspects of the APE in this particular locale. As you know, our testing program within the APE was essentially terminated after the 'previously identified' burial event and all that went along with it. In order to address your concerns we propose that some additional subsurface testing within the APE in the Kaulawela corridor of the proposed road take place, and an addendum detailing the results of this testing be added to our original report and submitted to your office for review.

Next are your comments on **Section 7. Evaluations of Site Significance and Recommendations**. Certainly your concern over the possibility of 'adverse effect' to the OR&L Railroad is understandable, however may we suggest you modify your statement to read 'indirect effect' as the proposed road will directly impact the OR&L Railway in only one place, and that is in an existing cross over area where there already is a modest impact. Additionally, such cross overs are standard and are necessarily associated with all railroads. Neither the existing cross over nor the construction of the proposed road will interfere with any plans to reopen the tracks or resume train operations. There can be no question that the association between the proposed road and the railroad will be a snug one or that actual construction plans, when they become available, must pay particular attention to preservation concerns. To address this concern, we suggest that a specific and separate Preservation Plan be written coincidental and in concert with the road design documents and that members of the society who have designs on resuscitating the OR&L railroad system be a party to all discussions.

I do hope that this letter has addressed the concerns outlined in yours of 2-26-02. If there are any questions, please feel free to contact me directly.

Sincerely,


Joseph Kennedy
Principal Investigator

CULTURAL SURVEYS HAWAII, INC.
Archaeological Studies

Hallett H. Hammatt, Ph.D.
733 N. Kalanooa Avenue, Kailua, Hawaii 96734
Bus: (808) 262-9972 • Fax: (808) 262-4950 • Toll-Free: 1-800-599-9962
e-mail: kmcguire@csurveys.com

March 29, 2002

Sherri Hiraoka
Townscape, Inc.
900 Fort Street Mall, Suite 1160
Honolulu, Hawaii 96813

Dear Ms. Hiraoka:

Following is our response to the Chapter 6E-8 Historic Preservation Review of the "Traditional and Cultural Practices Assessment for the Proposed Wai'anae Coast Emergency Access Road Project".

In a telephone conversation with Holly McElDowney (3/26/02) of the DLNR/SHPD Culture and History branch, comments on the issues of burials and the O.R.&L. railroad track raised in the cultural practices assessment were covered in SHPD's review of the archaeological inventory report. Thus, it is more appropriate for the archaeological firm that conducted the archaeological inventory survey to respond to these two overlapping issues.

Overall, the DLNR/SHPD comments were minor and asked for revisions and clarification to "Section IV Summary and Recommendations" relating to three specific issues, Pu'u Kamale, Kane I Ka Pualena Heiau and the location of a night marchers' path on Mahina au Road. Our comments will be limited to these three issues.

The cultural assessment identified the three above mentioned potential traditional cultural properties. DLNR/SHPD requested a definitive statement in the report summary as to whether any traditional cultural properties were identified or not. Sometimes cultural issues cannot be determined as clear "cut and dry" issues. In the case of the pu'u, even though no associated practices were identified with this pu'u, it is still a sensitive issue to certain community members because of their

Page Two
Letter to Sherri Hiraoka
March 29, 2002

belief (through family oral tradition) that Kane i ka Pualena Heiau was located at the base of the pu'u and therefore the pu'u is sensitive by virtue of association and proximity to the heiau location. As to the location of Kane i ka Pualena Heiau, as discussed in the report, there is a discrepancy between the written historical record and the oral record. I do not feel I can with certainty make a strong argument in defense of one or the other. Likewise, with the night marchers' route, the actual path of the night marchers is not known. All that seems to remain of this tradition is fragmentary stories that place the path in the vicinity of Mahina au Road.

The present stance of the DLNR/SHPD is not to comment on recommendations #1 (cultural monitoring) and #3 (Hawaiian blessing) because they fall outside of their jurisdiction of Chapter 6E (HRS). However, because the above three issues are considered "potential" traditional cultural properties that are culturally sensitive to the Wai'anae Coast community, these two recommendations are offered as mitigative measures on the part of the client to show cultural sensitivity in responding to community concerns.

In response to the DLNR/SHPD's suggestions, Summary (Section IV.A) has been revised and should be amended in the final EA. The suggested revisions are enclosed for your review. I will be out of town from April 8 - April 22. If possible, please respond by Friday, April 5th.

Sincerely,

Ka'ohulani McGuire

Ka'ohulani McGuire

Enclosure

[Revisions to the WCEAR Report, to be inserted between paragraphs three and four of Part A. "Summary".]

As stated earlier in this report, the actual location of Kāne i ka Pualena *Hetau* is in question because of a difference between the written record (McAllister 1933) and the oral record indicated by several community members. McAllister's survey indicated that all the stones had been removed and the "approximate location in the cane was pointed out" (*Ibid.*:114). Maps on file at the Department of Land and Natural Resources/State Historic Preservation Division seem to indicate the approximate location being in the vicinity of the present Kamaile Elementary School. The oral tradition according to several families places the location of this *hetau* at the base of Pu`u Kamaile`unu. At the present time, there is insufficient evidence to make a stance in favor of one location or the other. As for Pu`u Kamaile`unu, there were no associated cultural practices tied to this *pu`u*. However, the *pu`u* remains a sensitive issue to those who believe Kāne i ka Pualena *Hetau* was located near its base.

Likewise, there are remnant stories of a night marchers path along or through Mahina au Road. The actual route of the path is unknown and cannot be determined at this time with any certainty. It is possible that someone does know where the route traverses Mahina au Road but no one came forward with this knowledge during the course of this study.

The information gathered during this study suggests that Pu`u Kamaile`unu, Kāne i ka Pualena *Hetau* and the night marchers route on Mahina au Road could be "potential" traditional cultural properties, however, there is insufficient information available at this time to say with certainty whether they are or not.

Recommendations #2 and #3 below are suggested as ways to mitigate community concerns related to these three issues.

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REFERENCES

City and County of Honolulu, Department of Planning and Permitting. May 1999. Land Use Ordinance.

City and County of Honolulu, Department of Planning and Permitting. July 2000. Waianae Sustainable Communities Plan.

City and County of Honolulu, Department of Planning and Permitting. August 1999. Waianae Sustainable Communities Plan Background Report.

Federal Emergency Management Agency. September 30, 1995. Flood Insurance Rate Map, City and County of Honolulu, Hawaii, Panel Number 150001 0125 B.

Hawaii State Department of Business, Economic Development and Tourism. 1999. The State of Hawaii Data Book 1999.

Malama Nanakuli Ahupuaa. October 2000. Elements of a Plan for the Preservation of Nanakuli Valley.

State of Hawaii Department of Hawaiian Home Lands, Land Development Division, Design and Construction Branch. December 2000. Environmental Assessment for Nanaikapono Subdivision Upgrades in Nanakuli, Oahu, Hawaii.

United States Army Corps of Engineers and the United States Department of Agriculture, Natural Resources Conservation Service. September 2001. Lualualei Flood Study Executive Summary, Waianae, Oahu, Hawaii.

University of Hawaii at Hilo Department of Geography. 1998. Atlas of Hawaii, Third Edition. University of Hawaii Press. Honolulu.

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**AN ARCHAEOLOGICAL INVENTORY SURVEY REPORT
FOR THE WAI'ANAE COAST EMERGENCY ACCESS ROAD
WAI'ANAE DISTRICT, ISLAND OF O'AHU
DECEMBER 2001**

**Prepared for: Townscape, Inc.
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*Inventory Reports * Data Recovery Reports * Research Design Documents * Monitoring * Due Diligence Work * Historical Studies * Cultural Studies * Burial Treatment Plans * Preservation Plans * Interpretive Reconstructions * Restorations * Qualified Expert Witness Testimony*

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Abstract

An Archaeological Inventory Survey has been conducted along the Wai'anae Coast on the Island of O'ahu. The subject properties, comprised of five separate roadway corridors, are scheduled for a proposed emergency alternative access road. The purpose of these investigations was to determine if significant historic properties exist within the project limits and, if present, properly document and evaluate those sites.

Investigations took the form of a 100% surface survey of the subject properties and the excavation of thirty-six backhoe trenches. Two sites of historic significance were identified on the subject property, Site 50-80-07-5949 and 50-80-07-5950. Site 5949 consisted of a traditional permanent habitation (likely pre-Contact to early-Contact era), and includes one human burial. This site is considered to be a part of a complex of sites referred to as the Wai'anae (Kamaile) Complex (Site 1181, placed on the National Register of Historic Places in 1972), including Kamaile Heiau (Site 161), Kuka'au'au Cave, (Site 1185) and a cluster of stone platforms and a C-shaped enclosure (Site 1190) which have been previously documented (Hommon 1978) and are listed on the National Register of Historic Places. Site 5950 contains a portion of a sugar plantation camp and pumping station (ca. late 1800s to early 1900s). Portions of Sites 5949 and 5950 which lie outside the subject property were not addressed during the current investigations.

Because individual sites within the Wai'anae (Kamaile) Complex (Site 1181) have also been assigned individual State Site numbers, in order to cite the sites being discussed accurately, this document will use nomenclature citing the State Site Complex number followed by the individual State Site number placed in parentheses. For example, Site 5949 of Site Complex 1181 will be referred to as "Site 1181(5949)."

As a result of the current investigations, the historic properties of Sites 1181(5949) and 5950, located in Kamaile, are considered significant to the interests of historic preservation. Archaeological Consultants of the Pacific, Inc. recommends that a determination be made that construction activities would have "adverse effect" on Sites 1181(5949) and 5950 under the Advisory Council Regulations, 36 CFR 800. Data Recovery investigations and the preparation of a Burial Treatment Plan are recommended for Site 1181(5949). Data Recovery is recommended for Site 5950. Because of the proximity to Kamaile Heiau, Site 1181(161) and Kuka'au'au cave, Site 1181(1185), construction activities at the current subject property in Kamaile will have an indirect impact on these sites, it is therefore considered to have an "adverse effect" on those sites under the Advisory Council Regulations, 36 CFR 800. Due to the proximity to the O.R. & L. railroad (Site 9714), construction activities at the current subject property in Nanakuli will have an indirect impact on this site, it is therefore considered to have an "adverse effect" on the site under the Advisory Council Regulations, 36 CFR 800. As the O.R. & L. railroad (Site 9714) lies immediately adjacent to the subject property, care should be taken to avoid this site.

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APPENDIX B

Archaeological Survey



An Archaeological Inventory Survey Report for the Wai‘anae Coast Emergency Access Road, Wai‘anae District, Island of O‘ahu

Section 1: Introduction

At the request of Ms. Mary O’Leary of Townscape, Inc., Archaeological Consultants of the Pacific, Inc. (ACP) has conducted an Archaeological Inventory Survey of properties located along the Wai‘anae Coast (portions of TMK Plats: 8-4-2, 11, 14, 15, 17, 19, 20, 21, 22, 24, 25, 26, 29; 8-5-2, 3, 7, 9, 14, 16, 18, 19, 20, 21, 26, 27, 28, 35; 8-6-1, 2, 3, 11, 12, 13, 14, 17, 20, 21, 22, 23, 25; 8-7-1, 3, 6, 7, 10, 17, 18, 19, 20, 21, 22, 29, 30, 31, 32, 34, 40; 8-7-7, 8, 9, 10, 21, 31, 32; 8-8-1; 8-9-1, 2, 3, 4, 5, 6, 7, 8, 10, 11 and 15) in the *ahupua‘a* of Makaha, Wai‘anae Kai, Lualualei and Nanakuli, district of Wai‘anae, on the island of O‘ahu (see Figure 1). Landowners include the State of Hawai‘i, City and County of Honolulu, United States of America, and various private owners. The subject properties are planned to be utilized as an emergency alternate access route.

The purpose of these archaeological investigations was to perform the tasks and meet the requirements specified by Section 106 of the National Historic Preservation Act of 1966 (NHPA) as well as those of the State of Hawaii, Department of Land and Natural Resources, State Historic Preservation Division (DLNR-SHPD). These investigations would allow for the identification of potential historic resources located on the property as well as an evaluation of their significance including their eligibility for inclusion in the National Register of Historic Places. These investigations also allow for the making of recommendations concerning the mitigation of the impact of future construction activities upon potentially significant historic resources.

Section 2: Environmental Setting

The subject properties are located along the Wai‘anae Coast, between 30 and 2200 meters (m) from the coast predominantly *mauka* of Farrington Highway. The properties extend from geographic grid coordinates 158° 09’ 35”W by 21° 23’ 41”N to 158° 12’ 17”W by 21° 28’ 05”N and UTM coordinates 4582392E by 2374026mN to 4587085mE by 2365919mN (see Figure 2). The properties range in elevation from approximately 10 feet (ft) above mean sea level (AMSL) to 70ft AMSL. Five segments of proposed road corridors extend intermittently for a length of approximately 12 kilometers (km)(see Figure 3). Most of these corridors follow existing paved

Figure 1: Project Location Areas on a Map of Oahu

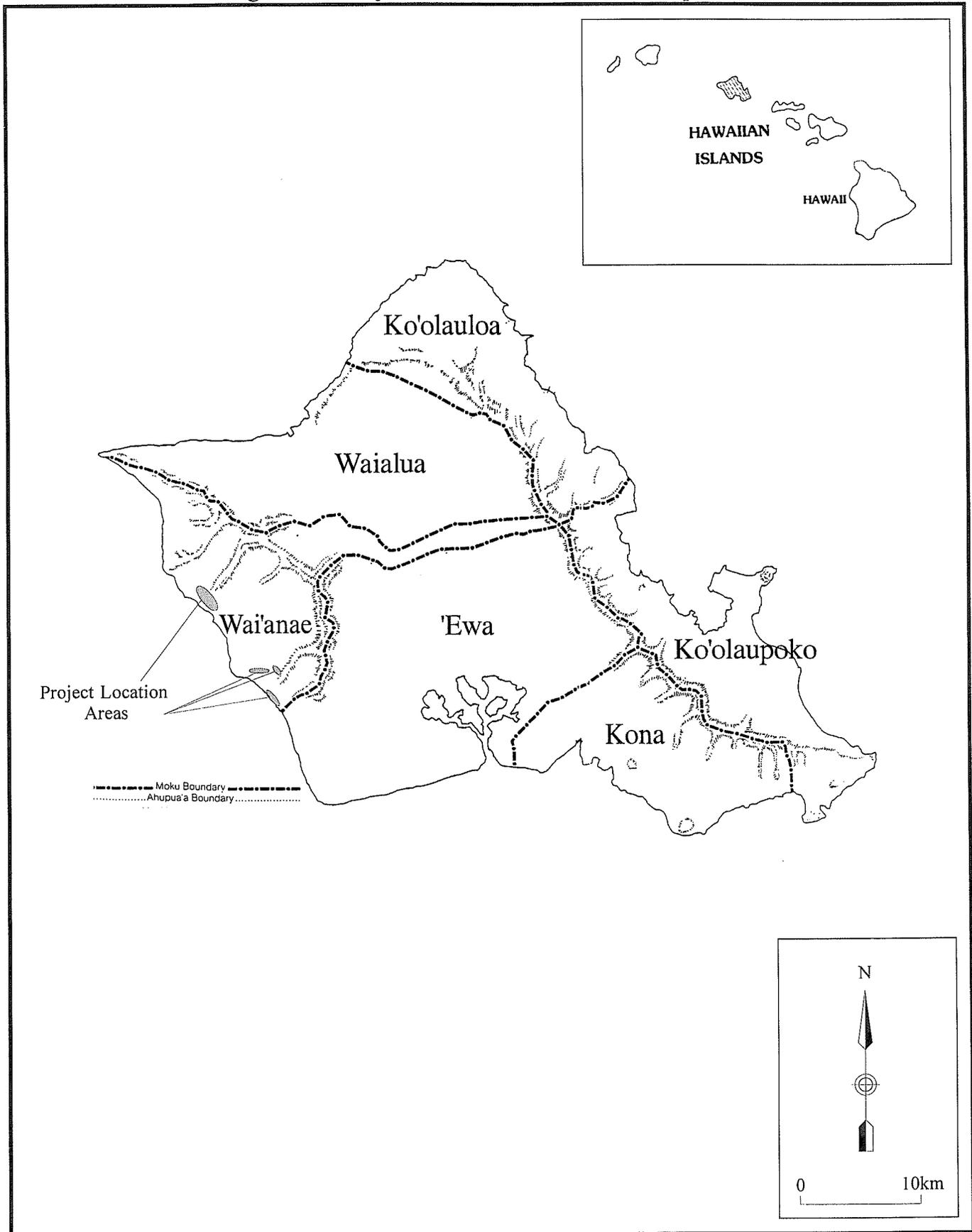


Figure 2: Location of the Subject Property on a U.S.G.S. Topographic Map

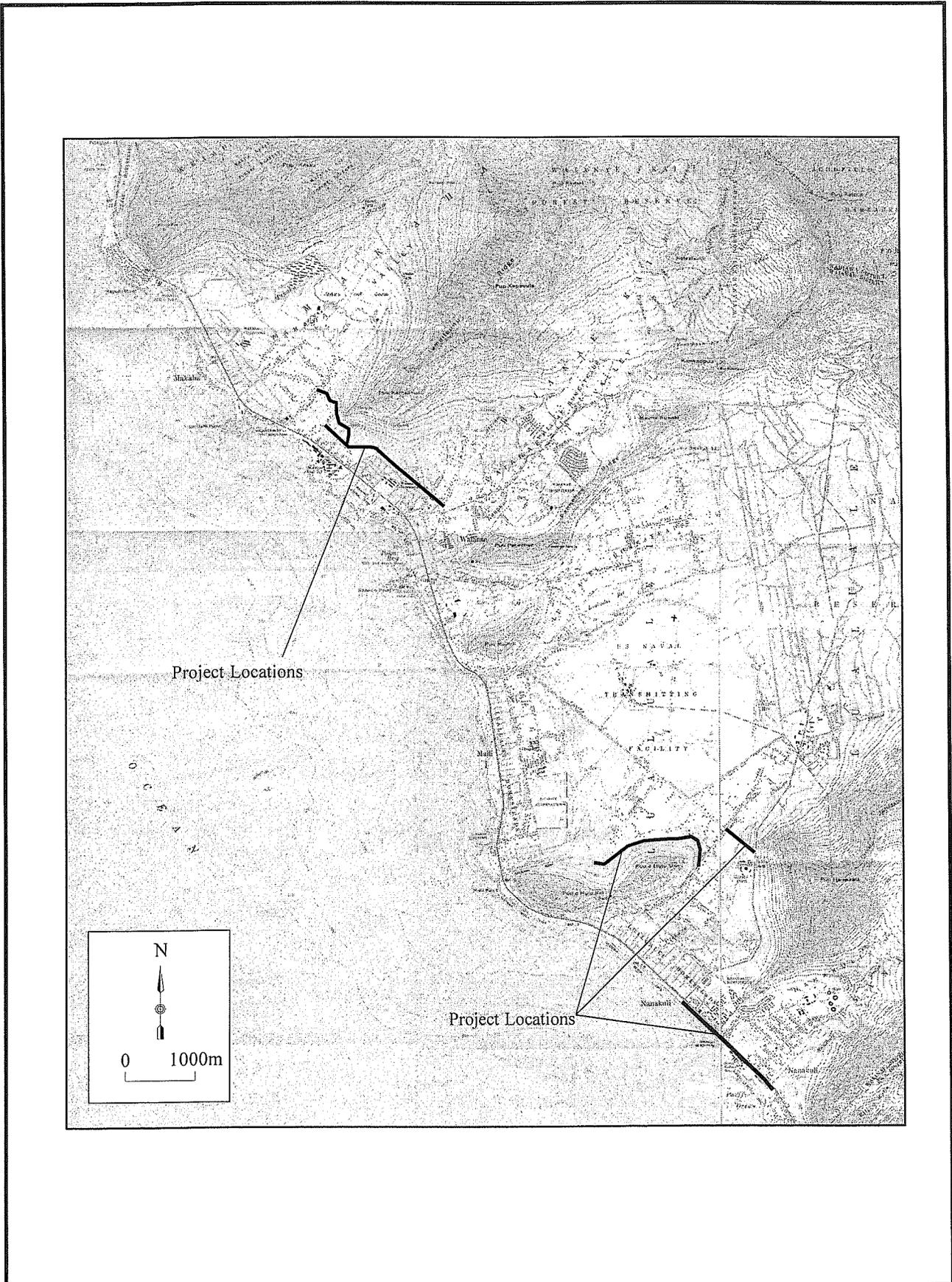
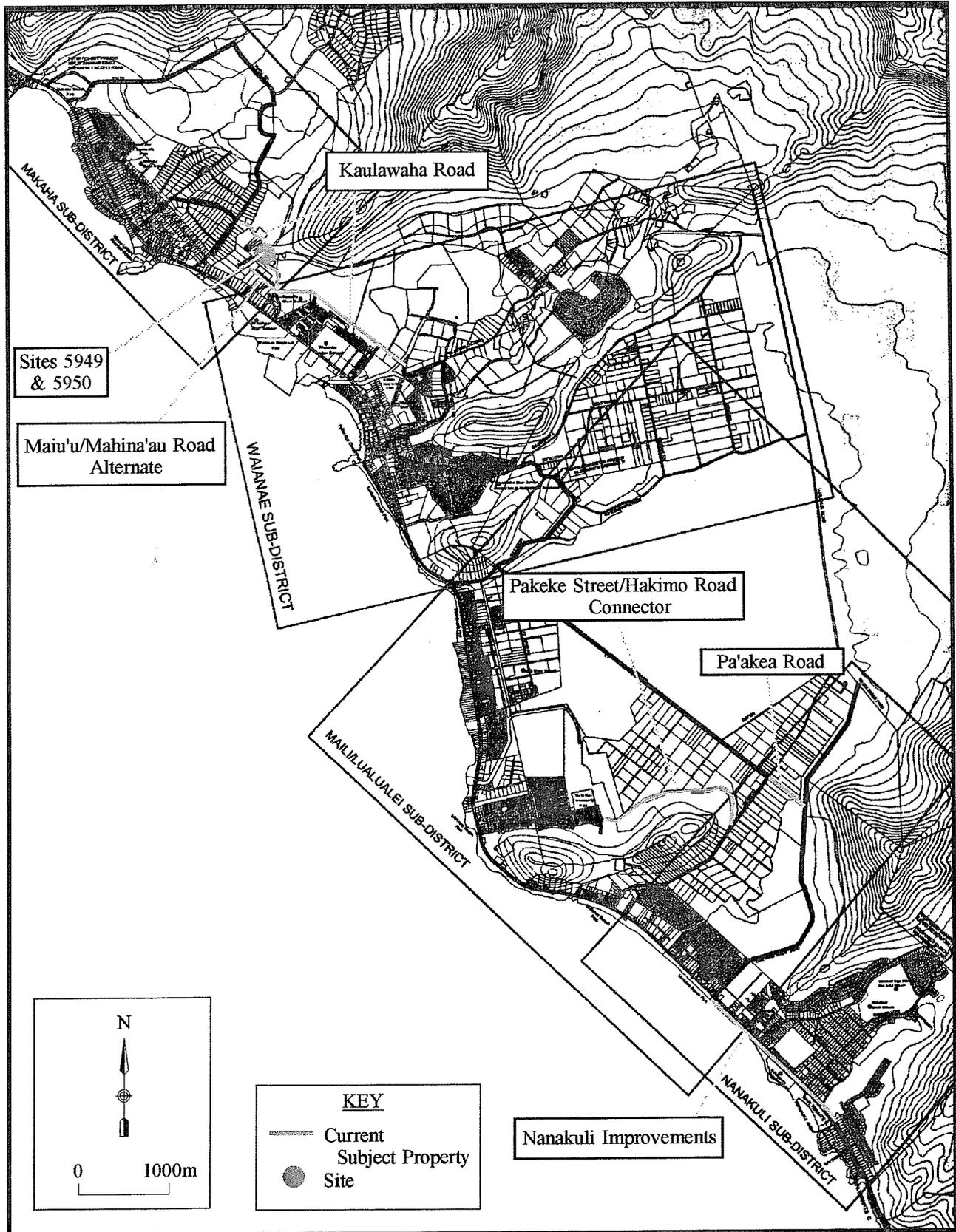


Figure 3: Plan Map of Waianae Coast Emergency Access Road Corridors



Waianae Coast Emergency Access Road

source: Gray, Hong, Bills, Nojima & Associates Inc. nd

or dirt roads. An area of potential effect (APE) of 40 feet (12.2m) on either side of the centerline has been established for these corridors.

The Kaulawaha and Mahina'au Road corridors are located in Kamaile at the base of Kamaile'unu Ridge, which divides Makaha and Wai'anae Valleys. The Kaulawaha Road corridor is located in Makaha and Wai'anae Kai Ahupua'a. The corridor follows Kaulawaha Road from its intersection with Makaha Valley Road to the intersection with Maiu'u Road, then follows a dirt trail/road until its intersection with Mahina'au Road. The portion which follows Kaulawaha Road is bounded by numerousouselots on the south and undeveloped land on the north. The portion which follows the dirt trail/road is surrounded by undeveloped land. According to Foote et al. (1972), soils in this area consist of Waialua silty clay (0-3% slopes with dark reddish brown silty clay), Lualualei extremely stony clay (3-35% slopes with extremely stony very dark grayish brown clay), Lualualei clay (0-2% slopes with very dark grayish brown clay) and coral outcropping. The corridor then turns east on Mahina'au Road until its terminus. This portion of Mahina'au Road to the east of Kaulawaha Road is a dirt road/trail bounded byouselots and Kamaile School to the south and undeveloped land to the north. According to Foote et al. (1972), soils in this area consist of Lualualei clay (0-2% slopes with very dark grayish brown clay) and coral outcropping. From the east end of Mahina'au Road, the corridor continues in a southeasterly direction, paralleling Ala Akau and Ala Hema Streets until intersecting with Plantation Road. This portion of the corridor follows a dirt trail/road and a fenceline, and is bounded by undeveloped land. According to Foote et al. (1972), this area consists of coral outcropping.

The Maiu'u/Mahina'au Road Alternate corridor is located in Wai'anae Kai Ahupua'a, and follows Mahina'au Road from Maiu'u Road to Kaulawaha Road. This portion of Mahina'au Road is bounded by numerousouselots on its southwest side and undeveloped land on its northeast side. According to Foote et al. (1972), soils in this area consist of Lualualei clay (0-2% slopes with very dark grayish brown clay).

The Pakeke Street/Hakimo Road Connector and the Pa'akea Road corridors are located in Lualualei Ahupua'a. The Pakeke Street/Hakimo Road Connector corridor follows along a crushed coral road at the base of the twin peaks of Pu'u O Hulu Uka and Pu'u O Hulu Kai, beginning at the western end of Kaukama Road and contouring to the east-northeast, then joining with an unnamed road extending to the north from Hakimo Road (approximately 1850m). This corridor is mostly surrounded by undeveloped land. An agricultural lot and animal pens are present along the north side of the corridor. According to Foote et al. (1972), soils in this area consist of Lualualei clay (2-6% slopes with very dark grayish brown clay), Malama stony silty clay loam (0-12% slopes with dark reddish brown stony silty clay loam underlain by coral limestone and consolidated calcareous sand), Lualualei stony clay (0-2% slopes with stony very dark grayish brown clay) and Mokuleia clay (nearly level with very dark grayish brown clay underlain by dark brown loamy sand and light gray coral sand).

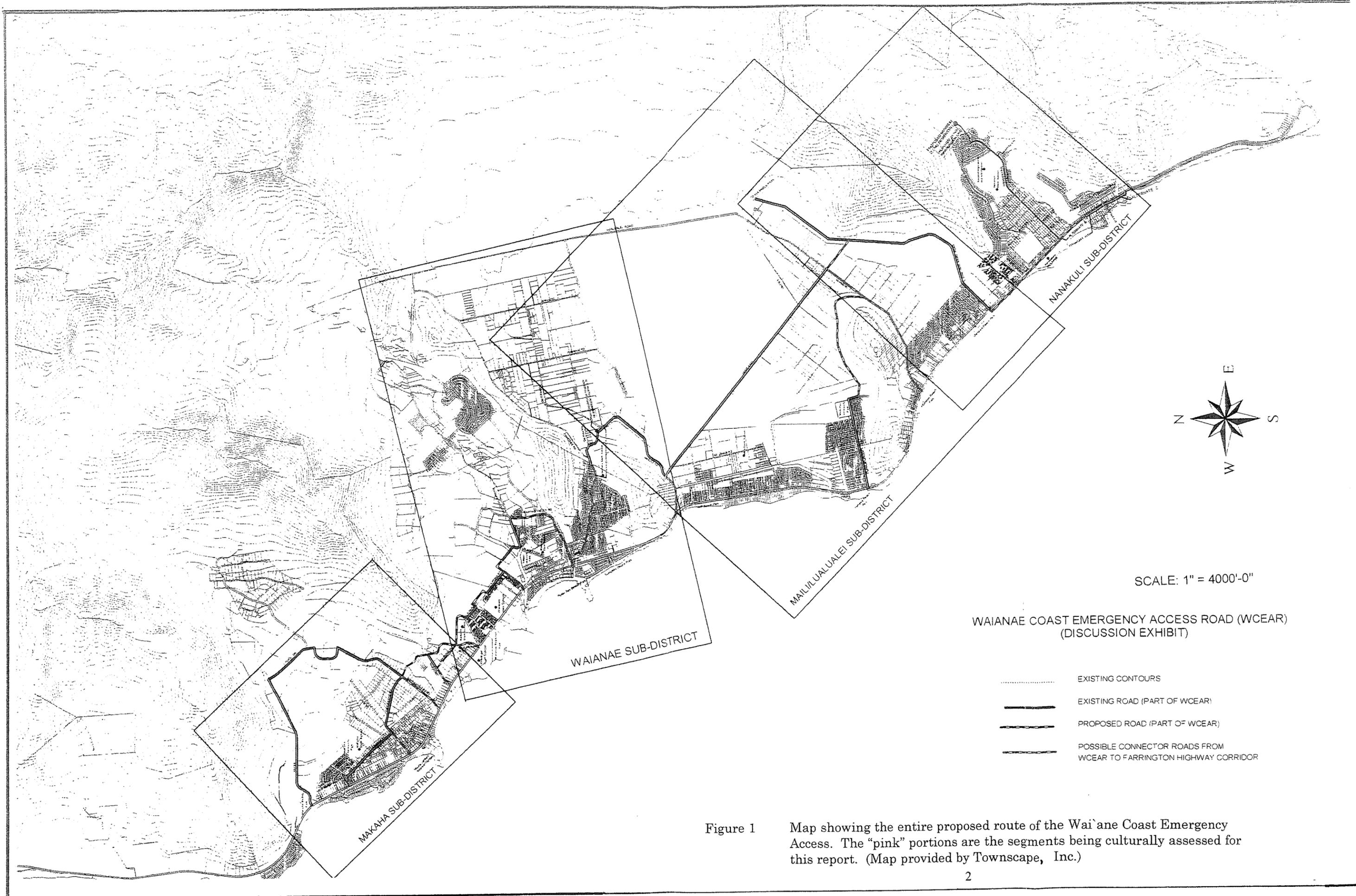
The Pa'akea Road corridor follows a portion of Pa'akea Road beginning at its intersection with Hakimo Road and continuing in a straight line to the southeast until intersecting with Lualualei Naval Road (approximately 504m). Agricultural fields bound this corridor.

According to Foote et al. (1972), soils in this area consist of Lualualei clay (2-6% slopes with very dark grayish brown clay), Pulehu very stony clay loam (0-12% slopes with very stony dark brown clay loam underlain by dark brown loam and sandy alluvium) and Lualualei extremely stony clay (3-35% slopes with extremely stony very dark grayish brown clay).

The Nanakuli Improvements corridor is located on the *makai* side of Farrington Highway in Lualualei and Nanakuli Ahupua'a. It extends from Lualualei Naval Road to Laumania Avenue (approximately 1920m). Ulehawa Beach Park, Nanaikapono Elementary School and Nanakuli Beach Park bound this corridor to the southwest and the O'ahu Railway and Land Company (O.R. & L.) railroad track (Site 9714) and Farrington Highway to the northeast. According to Foote et al. (1972), soils in this area consist of Malama stony silty clay loam (0-12% slopes with dark reddish brown stony silty clay loam underlain by coral limestone and consolidated calcareous sand), Pulehu clay loam (0-3% slopes with dark brown clay loam underlain by dark brown loam and sandy alluvium), beach sands and coral outcropping.

Vegetation along the subject corridors consisted of knee to waist high grasses and various weeds, and stands of scattered *kiawe* (*Prosopis pallida*), banyan (*Ficus benghalensis*), monkey pod (*Samanea saman*) and mango (*Magnififer indica*). Some areas were devoid of vegetation due to recent brush fires.

Rainfall on the subject property averages around 20 inches a year (Armstrong 1973). Intermittent streams were present along the project corridors. The Kaulawaha Road corridor crosses 'Eku and Kawiwi Streams, and the Pa'akea Road corridor crosses Ulehawa Stream. Ulehawa is "said to be the birthplace of Maui and to have been named for a chief" (Sterling and Summers in Pukui, Elbert and Mookini 1974). The topography of the subject properties generally consists of level or near to level ground surface on the valley floors. A small segment of the Kaulawaha Road corridor rises slightly along the base of Kamaile'unu Ridge. Portions of the Pakeke Street/Hakimo Road Connector corridor rise up along the talus slopes of Pu'u O Hulu Uka. The southeast end of the Pa'akea Road corridor rises slightly on the talus slope of Pu'u Heleakala. The Nanakuli Improvements corridor follows along coastal dunes.



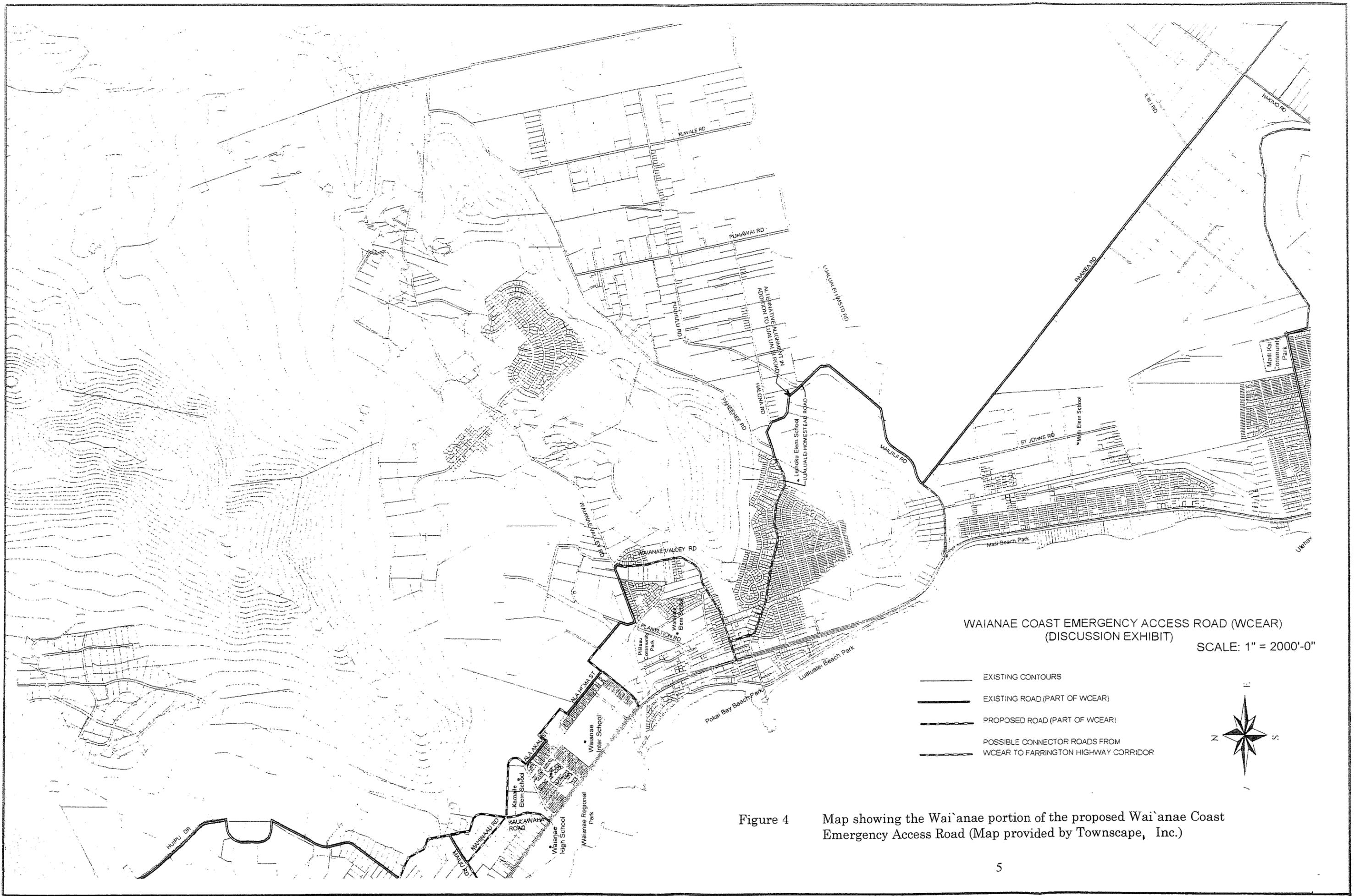


Figure 4 Map showing the Wai'anae portion of the proposed Wai'anae Coast Emergency Access Road (Map provided by Townscape, Inc.)

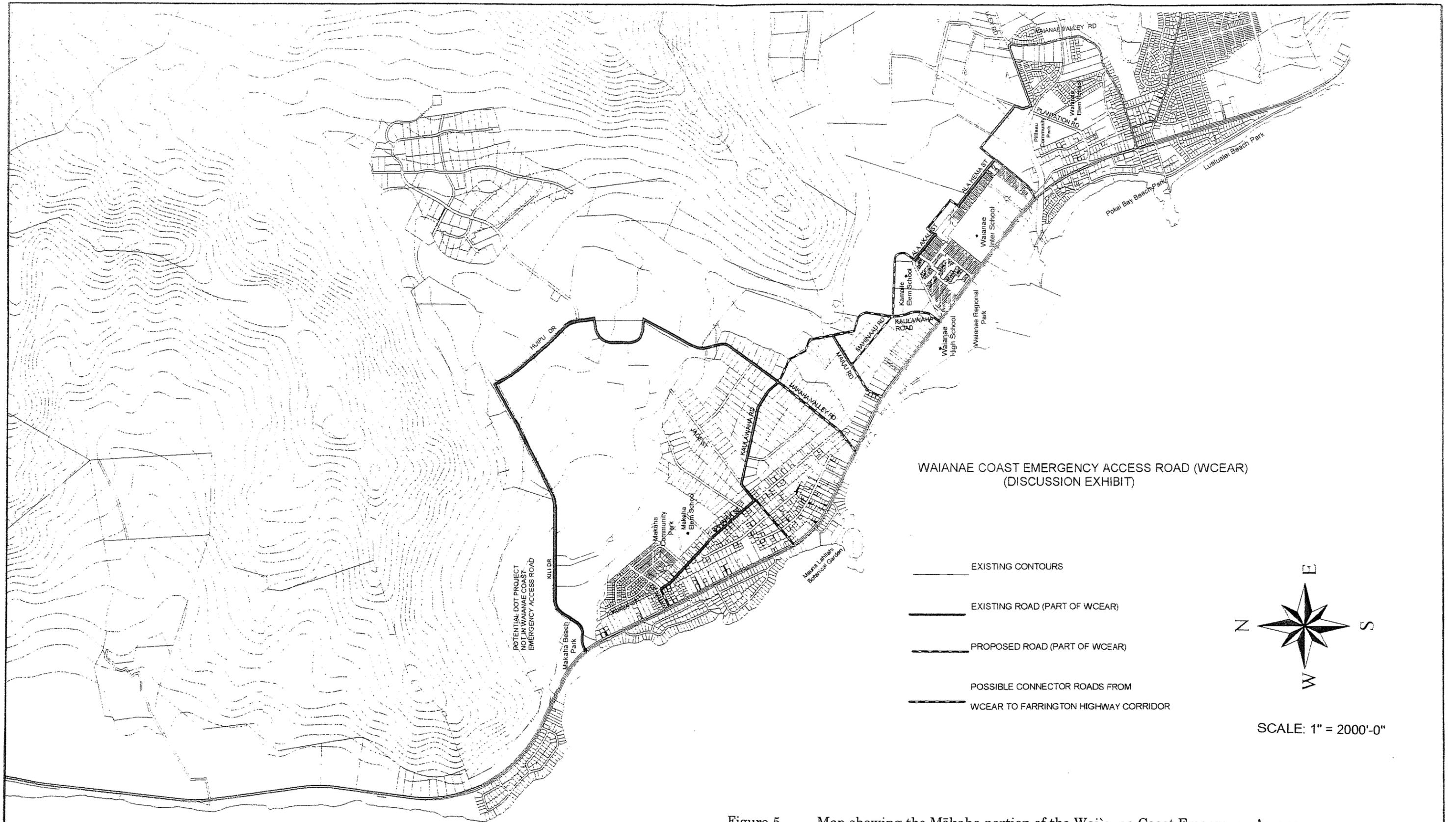


Figure 5 Map showing the Mākaha portion of the Wai'anae Coast Emergency Access Road (Map provided by Townscape, Inc.)

Section 3: Historic Background

The project area is located in the *ahupua'a* of Makaha, Wai'anae Kai, Lualualei and Nanakuli in the District of Wai'anae, on O'ahu's western shore. The district of Wai'anae has a prominent place in the Hawaiian oral tradition; its place names figure in central mythological cycles and in the stories of the ruling chiefs, suggesting perhaps a relatively early occupation of this land.

Stories of the demigod Maui are found throughout Polynesia, with local variations from each of the Hawaiian Islands. On O'ahu, these stories are centered in Wai'anae. Maui and his two brothers, Maui-mua and Maui-ikiiki, are said to have been born in Wai'anae. Hina, their moon-goddess mother, lived in a cave on the southern side of Wai'anae where she made the famous fishhook with which Maui tried to bring all of the Hawaiian Islands together, the snare for catching the sun and her own tapa cloth (Beckwith 1982:232).

The famous pig god, Kamapua'a, is known for his exploits in Wai'anae. He and his grandmother Kamaunuanoho, are said to have lived together on Mount Ka'ala where they could look down into Wai'anae. During the night, Kamapua'a would sneak down and steal taro from the patches in the valley. When the people of Wai'anae discovered that a pig was stealing their taro, they caught him and tied him to a rock named Paho. On the day set for killing him, the people found him gone from the rock and roaming about in the taro patches again. They caught him once again and took him to Pu'u Kahea where the *imu* (underground pit oven) had been prepared for his roasting. At this time many *kinolau* (supernatural bodies) crossed the plains and devoured the men of Wai'anae who had not fled (Sterling and Summers 1978:72).

Another story tells of Kamohoali'i, a shark god, who begot a half-man, half-shark child with a woman of Wai'anae. Many people were devoured before this shark-man was finally caught and killed (Hammatt, Borthwick and Shideler 1987:12).

Kawiwi, the mountain which lies between Wai'anae and Makaha valleys, has a couple of stories associated with it. An old woman is said to have lived alone on the mountain peak; when she was hungry, she called on the birds to feed her. Because her life was bitter, the priests proclaimed Kawiwi as a place of refuge during wartime; the place is known as Pali O Keawaawa (cliff of bitterness)(Site 167)(Sterling and Summers 1978:76).

Another story is told about a scar on the *pali* of Kawiwi (Site 168). A beautiful daughter of a Wai'anae couple fell in love with a *kupua* (supernatural being) who had the power to turn himself into an eel. The girl became sick and the people of Wai'anae killed the *kupua*. The scar on the *pali* became known as Kaoninapuhi, "the writhing eel" (McAllister 1933:118).

Poka'i Bay, at the mouth of Wai'anae Valley, took its name from chief Poka'i, who voyaged to O'ahu from Kahiki. He planted what is said to have been the first coconut grove in Hawai'i, at the "back of the beach near the mouth of the Wai'anae Stream, on the Makaha side of what is now known as Poka'i Bay" (McGrath et al. 1973:9).

Kolekole Pass, a gap in the Wai‘anae mountains where people could pass over from the Schofield Plateau into Lualualei, is said to have been a battleground where warriors of Wahiawa fought with warriors of Wai‘anae. Kolekole (meaning “raw”) is a reference to the wounds in their flesh (McGrath, Brewer and Krauss 1973:12).

John I‘i (1959) described and mapped ancient trails on O‘ahu. There were three trails which led into Wai‘anae: one along the leeward coast; another from Kukaniloko in Wahiawa through the Kolekole Pass; and another through the Pohakea Pass.

A legend associated with Pu‘u O Hulu (location of the Pakeke Street/Hakimo Road Connector corridor of the current subject property follows the base of this Pu‘u) is recounted in Sterling and Summers (1978):

Puu o Hulu was said to be a chief who was in love with Ma‘iliili, one of twin sisters, but he could never tell, whenever he saw them, which of the two was his beloved. A mo‘o changed them all into mountains so he is still there watching and trying to distinguish his loved one. (Victoria Holt, Nov. 1954)

Makaha literally means “fierce” and in traditional accounts the area was home to the ‘*Olohe*, wrestlers and bone-breakers, said to have robbed passing travelers (Pukui et al. 1974 and Green 1980:5). A somewhat different story is presented in a Pacific Legacy report which, citing McAllister (1933) and I‘i (1959), describes the residents of Makaha and Kea‘au as “robbers and cannibals” who were ultimately killed by hairless men (‘*olohe*) from Kaua‘i (Cleghorn 1997:6).

The historic background of Makaha Valley, including a review of the Land Commission Awards (LCAs) in Makaha Ahupua‘a, has been comprehensively documented for the Makaha Valley Historical Project (MVHP) by Ms. D.B. Barrere with the initial findings presented in Interim Reports 1 and 2 (Green 1969, 1970). Based upon those initial findings as well as additional analyses, the history of Makaha was thoroughly summarized and further documented in *Makaha Before 1880 A.D.* (Green 1980). A detailed review of the historic background and LCAs of Wai‘anae Kai Ahupua‘a may be found in a Bishop Museum report of an Inventory Survey and Mitigation project next to Wai‘anae Intermediate School (Flood, Klieger, Lebo, Dixon, Clark and Parry 1994). Summaries of the historic backgrounds and LCAs of Lualualei and Nanakuli Ahupua‘a may be found in a recent report by Cultural Surveys Hawai‘i (McDermott and Hammatt 2000). A review of the material presented in those documents will not be repeated in this paper. Following is a generalized summary of land use; a review of the previous archaeological work conducted in each of the *ahupua‘a* traversed by the subject corridors; a generalized summary of settlement patterns; and predictions of expected finds for each individual corridor segment of the current subject property.

Section 3.1: Land Use

The leeward lands of Wai‘anae are comprised of steep sided valleys with relatively level valley floors which are fronted by sandy beaches. A comprehensive review of the District of Wai‘anae has been presented in Cordy’s (1998) *Ka Moku O Wai‘anae: He Mo‘olelo O Ka Wa Kahiko*. The earliest use of the land was probably temporary campsites utilized in relation to fishing and resource gathering. One site near Kaupuni Stream at Poka‘i Bay contained a surprisingly early date of AD 600s-800s (Cordy 1998:6). Permanent habitation probably did not occur until after AD 1000. Cordy discusses initial permanent habitation in Wai‘anae:

In Wai‘anae, one might expect the earliest permanent settlement to have been in Wai‘anae valley at Pokai Bay in association with its flowing stream (Kaupuni) and at Kamaile with its spring (Keko‘o) – as these were the two best watered coastal lands in the moku. Then perhaps Makaha and parts of Lualualei with at least upland flowing waters, and perhaps perennial streams, would have been settled, and then the rest of the district.

Evidence for use of the land for *lo‘i* behind the coastal habitation areas in Wai‘anae Kai Ahupua‘a dates to as early as AD 1100s-1200s (Cordy 1998:8), whereas agricultural use “in Nanakuli, dry fields in the upper valley began to be built in the AD 1200s-1400s and permanent habitations in the 1300s-1400s and ... these sites seem likely to reflect later population spread from a somewhat earlier settlement along the shore” (Cordy 1998:8). As population on O‘ahu grew during the 1400s-1700s, permanent habitations likely increased and cultivation of *lo‘i* and dryland agriculture likely expanded.

In addition to the utilization of littoral resources, numerous fishponds provided a valuable resource. During the 1400s-1500s:

Coastal fishponds... were... probably constructed in these years under the sponsorship of the rule of high chiefs. A fishpond in Honouliuli along Pearl Harbor in ‘Ewa, Loko Paweo II in Waikiki, Moli‘i and Nu‘upia fishponds in Kane‘ohe Bay all have their initial constructions dated back to this period.⁵⁴ Some of the lineal marshlands behind the coastal dunes in the moku of Wai‘anae also may have been in use as fishponds at this time—perhaps in ‘Ohikilolo and Wai‘anae. (Cordy 1998)

Also during this time, more and larger *heiau* were likely built in association with the rise of the O‘ahu Kingdom. In the district of Wai‘anae, numerous *heiau* have been recorded along the coast and in both the lower and upper portions of the valleys.

Land use was significantly altered after Western Contact. Handy and Handy (1972:468) discuss the transition from taro to sugar, and note the cultivation of sweet potato and gourds was still in practice:

Although a relatively poor terrain, this valley (Wai‘anae Kai) nevertheless had once a considerable development of wet-taro culture along the main stream and its tributaries in the uplands now covered by forest and water reserve, and well down into the broad area now covered by sugar cane.

Gourds, of the *ipu manalo* variety, were found growing wild in the uplands in 1935. Lower down, in the dry area, there were sweet potato plantations.

The use of Kamaile (location of the Kaulawaha Road and the Maiu'u/Mahina'au Road Alternate corridors of the current subject properties) for *lo'i* cultivation and aquaculture is discussed by Flood et al. (1994):

...the 'ili of Kamaile ... appears ... to have been a contiguous land division of *lo'i* and tiny fishponds. Its political importance as a village and area of great taro productivity was no doubt due to the presence of freshwater springs on the flanks of Kamaile'unu Ridge. In an 1873 document of the ancient divisions of O'ahu, Kamaile is listed as an *ahupua'a* Wai'anae *kalana*, of equal standing as Nanakuli, Wai'anae, Makaha, Kea'au, 'Ohikilolo, Makua, and Keawa'ula (Kuhano in Kame'eleihiwa 1992:330). During the Mahele, however, Kamaile was treated as an 'ili of Wai'anae Kai.

In the mid-eighteen hundreds, taro was still being grown in Kamaile, and Native Register and Testimony for the LCAs in Kamaile list the land uses as primarily "patches," or *lo'i*, with pastures and occasional houselots (refer to Table 1). The additional cultivation of cotton in Kamaile is noted in an article from the Hawaiian Gazette:

I stopped at Kamaile, a fertile, well-watered little land, between Waianae and Makaha. The people here appeared thriving and well to do. The taro lands were well cultivated. There were a number of fish ponds, and I noticed a considerable quantity of land under cotton culture. (Hawaiian Gazette 1865, in Flood et al 1994)

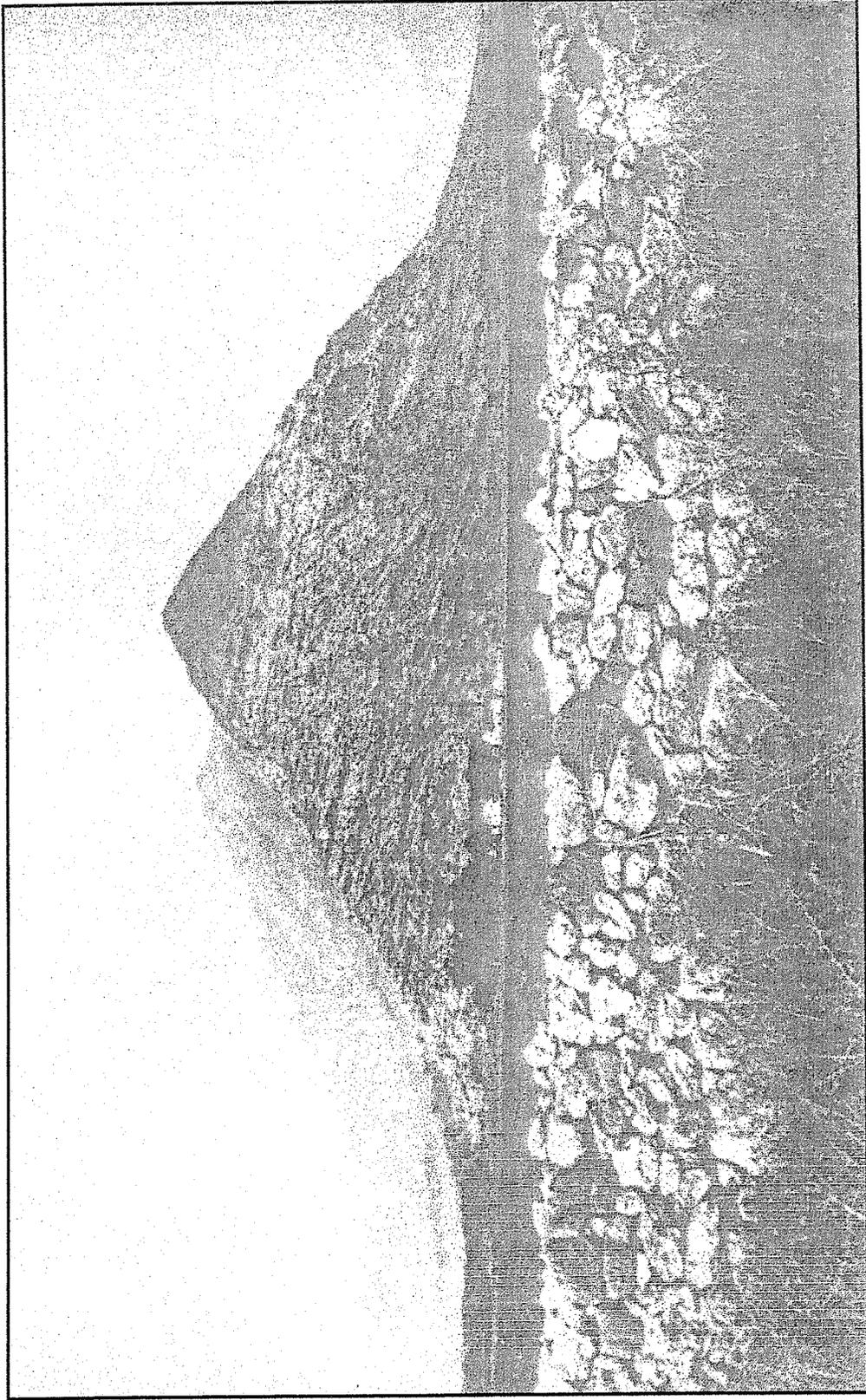
In the latter half of the nineteenth century, land use in Wai'anae shifted from traditional agriculture to large-scale ranching and sugar production. According to a 1863 missionary report, most of the land in the Wai'anae District was being used for grazing, and had been divided into six or seven large land divisions under long term lease or sold in fee simple. Only one hundred acres were reportedly left under taro in Wai'anae Valley (McGrath et al. 1973:31). By the late 1870s, ranching had become the leading industry on the coast. In 1880, J.I. Dowsett leased 17,200 acres of crown land in Wai'anae Valley for a grazing ranch. A 1919 Fire Control Map by the U.S. Army War Departments Corp of Engineers shows stone wall alignments, likely related to cattle ranching, one of which is located along the base of Pu'u O Hulu Uka, near the Pakeke Street/Hakimo Road Connector corridor of the current subject property (Figure 5 in McDermott and Hammatt 2000).

Sugarcane was first cultivated on O'ahu by John Emerson earlier in the century in Waialua (McDermott, Kikilo, Creed, Schideler and Hammatt 2000). In 1878, Hermann A. Widemann, a German immigrant, began Wai'anae Plantation (also called Wai'anae Co.), the first large-scale sugar plantation on O'ahu. Sixty acres were cleared and planted not far from Wai'anae Village, and a mill was built by 1880. In 1879, the plantation leased most of Wai'anae Kai for 25 years, brought in twenty local Hawaiians, fifteen Caucasian technicians and almost 60 Chinese laborers (McDermott and Hammatt 2000:26). Twenty-four new houses were built in Wai'anae Valley to house these workers, and "a plantation camp was built at Kamaile on the site of the old Native Hawaiian village" (Flood et al. 1994:38)(see Plate 1). [Note: All documents relating to sugar plantations on O'ahu have been compiled by the Hawaii Sugar Planters Association which are currently housed at Hamilton Library at the University of Hawaii-Manoa.

Table 1: Summary of Land Use for LCAs in Kamaile

LCA	Awardee	Native Register	Native Testimony
1052	Kahalauliko	2 patches and a houselot (609v.2)	
1754	S. Kalama		
3098	Kamakai	1 claim, bounded on the west by houses (51v.4)	8 patches and a pasture (395v.9)
5236	Kamalama	3 claims including one bounded by <i>pali</i> and another by "the wall" (26v.5)	12 patches and a pasture (415v.9)
5296	Kaopukea	11 <i>lo'i</i> and one houselot; <i>lo'i</i> is bounded by <i>pali</i> on the north and a house to the south (34v.5)	8 patches and a pasture (417v.9)
5408	Mahi	4 claims including one house, some bounded by <i>pali</i> , one bounded by "the wall" (51v.5)	8 patches and a pasture (418v.9)
5408C	Holokaa	1 claim (51v.5)	9 patches in one section; houselot in second section (418v.9)
5408D	Nailimae	2 claims (51v.5)	10 patches and a pasture (419v.9)
5409	Makea	3 claims including one house which is bounded on the north by <i>pali</i> (52v.5)	3 patches and a pasture (413v.9)
7709	Keaweiiwa	2 claims including one bounded by a pig enclosure to the north and a meeting house to the south, and a second which is a houselot (439.v5)	9 patches and a houselot (415v.9)
8189	Manu	1 claim bounded by the <i>pali</i> to the north (505v.5)	10 patches and a pasture (423v.9)
8189B	Hopuhopuaukele	2 claims including one bounded by <i>pali</i> to the north and a houselot to the west (505v.5)	8 patches and a pasture (414v.9)
8189C	Kumukahi		2 patches (423v.9)
8189D	Nakoalele		"a taro moo" with 8 patches and a pasture in section 1, a house site in section 2 (423v.9)
8307	Kukanono	1 <i>lo'i</i> and one houselot "The lot and the <i>lo'i</i> are bounded on the north by the house of Mahi and the cave of Kukaauau, on the east by the <i>lo'i</i> of Hopuhopuaukele, and the <i>lo'i</i> <i>po'alima</i> of Kahalehili, on the south by the fish pond of Liliha and the <i>lo'i</i> of Pule, on the west by the house of Manu."	1 patch and one houselot; land bequested to grandchild upon death of Kukanono (404v.9)
9479	Kahinu	1 claim (463v.4)	16 patches and a pasture (408v.9)
9480	Ohule	5 claims (463v.4)	8 patches in 6 sections (409v.9)
9481	Kaluaoku	2 claims, land and houselot (465v.4)	<i>mo'o</i> land (410v.9)
9482	Kawaamoole	3 claims (465v.4)	11 patches and a pasture (411v.9)
9483	Kahue	3 claims (466v.4)	18 patches and a pasture (420v.9)
9484	Hema	3 claims, including 2 bounded by "watercourse" (467v.4)	12 patches and a pasture (420v.9)
9485	Lae	1 claim (468v.4)	13 patches and a pasture (411v.9)
9486	Kaipu	2 claims, including one bounded by "the wall" (468v.4)	13 patches and a pasture (412v.9)
9486C	Kaana		
9486E	Kuheleloa		12 patches in one section and a houselot in a second section (412v.9)
9487	Kauo	2 claims for land and houselot (469v.4)	1 patch and one houselot (407v.9)
9488	Keohokapu	2 claims, including one bounded by the "watercourse" (469v.4)	3 patches (420v.9)
9489	Kanelele		12 patches and a pasture (408v.9)
9489B	Holi	1 claim (470v.4)	18 patches and a pasture (416v.9)
9490	Kamuno	2 claims (470v.4)	12 patches and a pasture (419v.9)
9491	Kaneele	2 claims including one bounded by "the wall" (471v.4)	
9492	Paaluhi	4 claims including one bounded by "the wall" (471v.4)	7 patches and a pasture (419v.9)
9493	Kuleleloa	1 claim (472v.4)	10 patches and a pasture (429v.9)
9865	Kaili	"This man did not make a claim. There was no letter, only the name, and number and month." (485v.4)	7 1/2 patches and a pasture (421v.9)
10,356	Nuhi	6 <i>lo'i</i> and a house (not a houselot) (542v.4)	3 patches and a house (422v.9)

Plate 1: Photo of Kamaile Plantation



Waianae Coast Emergency Access Road

source: Krauss 1973

Unfortunately, no documentation exists in this collection relating to any plantation camps aside from one in Waipahu.]

Flood et al. (1994:39) discuss some of the problems Widemann faced:

Probably the greatest challenge for Waianae Co. was locating more water. Wai'anae stream did not have enough water to accommodate all the new sugar fields popping up. The answer to this problem was drilling, a new process designed to tap artesian water. The process was discovered in nearby 'Ewa in 1879. Widemann took the opportunity to make use of this new discovery. He contracted the three McCandless brothers, pioneers in this field, to drill 33 wells into his property at a cost of \$50,000.00 to \$75,000.00. They could only charge him full price if they found water and half price if they found nothing (Pratt 1939:275). The resulting volume of water was insufficient, forcing the company to augment with whatever surface water they could find.

McGrath et al. (1973:75) further elaborate on methods used in obtaining water:

...The expensive well drilling campaign had developed a nest of 18 wells at Kamaile. They produced about 3,000,000 gallons daily. But the water was more salt than fresh. So the drive to buy up more water rights and to develop new sources grew more intense instead of less.

In the 1890s a new leader began guiding this relentless search for water. He was John M. Dowsett, Widemann's son-in-law... Reports credit him with pushing a plan to reforest upper Waianae Valley in order to create a watershed area. Workmen planted trees, then fenced off the lower slopes of the mountains to keep out the cattle, so the vegetation would grow. Meanwhile, they dug an elaborate network of ditches to catch the runoff. ...By 1897 the ditches were producing 2,200,000 gallons of water a day. ...[Dowsett] had his men build a reservoir at the base of the mountains. He installed a hydro-electric plant ...about two miles below the pali (cliffs) and the reservoir. He dropped the water from the reservoir to the hydro-electric plant in a sluice 7,000 feet long. The fall of the water developed 440 horsepower, enough to generate 300 kilowatts of electricity. This electrical power drove the plantation's water pumps at the wells, operated the mill generators in the off season and provided electric lights for the plantation manager's house at a time when many people in Honolulu were still using kerosene lamps.

A four-inch pipe from the hydro-electric plant to the village provided a domestic fresh water supply for the plantation camps. The rest of the water ran off in open ditches to sweeten brackish irrigation water being pumped from the Kamaile wells. Other pumps lifted the mixture into a network of flumes and ditches which led to cane furrows as far away as Lualualei.

Despite the water problem, the sugar boom revived the economy of Wai'anae, and by 1884 it was the largest settlement outside of Honolulu. In 1890, the Wai'anae Plantation had 600 acres under cultivation and the population of Wai'anae had increased. In 1895, O.R. & L. railroad, started by Dillingham in 1889, reached the Wai'anae Sugar Company and connected it to the Ewa mill; by 1898, the railway extended around Ka'ena Point and linked up with Waialua. Wai'anae Village grew and was the center of population and activity (Kuykendall 1967:100 and McGrath et al. 1973).

Coffee cultivation was also attempted in Wai'anae during this period. In 1886, August Ahrens planted 45 acres of coffee in the lee of Mount Ka'ala at the head of Wai'anae Valley.

Coffee did not turn out to be as lucrative as sugarcane. The local economy continued to be dominated by sugar into the twentieth century (McGrath et al. 1973).

Between 1917 and 1921, leases on 200,000 acres of government land in Wai‘anae District expired. An area of land in central Wai‘anae Kai was turned into Wai‘anae Homesteads, residential plots for people of Hawaiian ancestry.

During World War II, the sugar industry in Wai‘anae declined. The draft and abundant supply of defense jobs created a labor shortage on the plantation. The Wai‘anae Coast was used as a location for practicing amphibious landings, a recreation center was set up at Poka‘i Bay, and much of the sugarcane land was taken over by the military (McGrath et al. 1973:136). The military occupied much of the Wai‘anae Coast and inflicted much damage along it (ibid 1973:138).

After the war, the Wai‘anae Plantation was never able to turn a profit. Increasing labor and operational costs forced the company to liquidate in 1946. At the time, people thought that the collapse of the plantation would lead to the collapse of the revitalized Wai‘anae Coast. In 1947, Chinn Ho, of Capital Investment Company, bought nearly 10,000 acres of land in Wai‘anae, and subdivided the land into cheap beach lots in fee simple (McGrath et al. 1973:151).

In 1940, a government census counted 2,948 permanent residents along the Wai‘anae Coast (McGrath et al 1973:145). By 1950, the government census noted 7,024 permanent resident along the Wai‘anae Coast (McGrath et al. 1973:151). Much of the population increase can be attributed to Ho’s marketing of cheap lots.

In the 1950s and 1960s, the population continued to steadily increase in Wai‘anae, much due to the work of Ho. A breakwater was built to protect fishing boats in Poka‘i Bay, the water supply was improved and jobs opened up in ‘Ewa with the development of the Campbell Industrial Park (McGrath et al. 1973:156).

Presently, Wai‘anae is the home of a large community. Population is concentrated along the coast and spreads up the flat bottoms of the valleys.

Section 3.2: Previous Archeology

Makaha Ahupua‘a

The earliest investigations of an archaeological nature conducted in Makaha Ahupua‘a were those of McAllister in 1933 who documented seven sites. The seven sites included two *heiau* (Site 170, Kaneaki; and Site 174, Laukinui), two traditional sites (Site 173, a promontory stone formation called Pukahea; and Site 175, two small pits called Mololokai which are

associated with the stories of cannibals), two groups of terraces (Sites 169 and 171) and a platform (Site 172).

The locations of two of these sites are known. Site 170, Kaneaki Heiau, is located in the mid-valley area and is a preserved site at which restoration has occurred. A cluster of habitation sites surrounds this *heiau* (Green 1980). Site 173, Pukahea, is located at the seaward base of the Makaha-Kea'au Ridge and is visible to those passing on Farrington Highway and Kili Drive.

Regarding Sites 169, 171 and 172, McAllister describes these as being located along Makaha Stream between one-half and two-thirds of the way up the valley (1933:119-121). That would place these features within the area surveyed during the MVHP and indeed the former location of Site 171 (although the site had been destroyed) was identified (Green 1980:18 and 50-53).

The former whereabouts of the remaining sites are unclear. Despite attempts in the mid-1960s, the former location of Site 174, Laukinui Heiau, has never been re-established (Green 1980:23 and Cleghorn 1997:7). It is also known that by 1933, Site 175 had begun to be infilled (McAllister 1933:121). Therefore, it is likely that subsurface excavations would be necessary to re-identify its location.

After a hiatus of over thirty years, archaeological investigations in Makaha Ahupua'a resumed with the MVHP. The MVHP, whose fieldwork was conducted by Bishop Museum between July of 1968 and June of 1970, is the most significant archaeological study performed within Makaha Ahupua'a to date. This project included an intensive archaeological survey of a large portion of the valley floor in which thousands of individual features were identified. This work has been well documented, being published in four volumes (Green 1969, 1970; Ladd and Yen 1972 and Ladd 1973) and summarized by Green in 1980.

A portion of the current subject property (the northwest end of the Kaulawaha Road corridor) is located at the *makai* end of the Lower Valley Survey Area. Two sites were located *mauka* of the current subject property, Sites 50-80-07-898 and 50-80-07-999. These sites contained extensive agricultural and habitation remains.

Several more recent archaeological investigations have been conducted in Makaha Ahupua'a. In 1991, Cultural Surveys Hawaii conducted an Inventory Survey of the Right-of-Way (ROW) for a 20-inch water main which extended from the Board of Water Supply (BWS), Makaha Booster Pump Station to the intersection of Farrington Highway and Water Street. Those investigations identified a single site (Site 50-80-07-4363), a linear earthen berm believed to be of historic origin associated with sugarcane cultivation (Hammatt and Robins 1991). The survey determined that the majority of the ROW has been greatly impacted by historic activities including the installation of previous water lines.

In 1994, ACP conducted a surface survey of the proposed BWS's Makaha 242 Reservoir Site located on the slopes of the Makaha-Kea'au Ridge approximately 1 kilometer (km) from the coast. Being located on the steeply sloped sides of the ridge, it is not surprising that the 1994

investigation determined that no sites of historic significance were located within the boundaries of the proposed reservoir site (Moore and Kennedy 1994).

In 1997, Pacific Legacy conducted an Inventory Survey of a parcel located on the inland side of Farrington Highway where the construction of a new beach park comfort station and parking lot has been proposed. A subsurface cultural deposit was identified within which a small "fire feature" was found (Cleghorn 1997). A charcoal sample from the "fire feature" was dated to a most probable age range of AD 1440-1690. Apparently these deposits have never been assigned a permanent site number.

In late 1999, ACP conducted an Inventory Survey of TMK: 8-4-02: 58 (Por.), located on the northern side of Kili Drive. It was determined that a majority of the property had been severely impacted by modern disturbances. Two features were identified, however, which were determined to likely represent remnants of MVHP Site Complex 776 (a complex with extensive agricultural and habitational sites) including one roughly stacked wall and one stone mound which had also been disturbed. No cultural materials were found in association with these features during subsurface investigations. Because these features have been determined to be located within the boundaries of Site Complex 776 and likely represent remnants of that complex they have been assigned permanent State Site # 776(5792) (Moore and Kennedy 2000).

Finally, also in late 1999, an Inventory Survey was conducted by ACP at TMK: 8-4-02: 50, located on the opposite side of Kili Drive from Parcel 58 described above. A total of eight features were identified during the surface survey, five of which were determined to be modern disturbances. Three features were determined to be potentially significant historic properties and were subjected to controlled testing. Upon testing, these three features were determined to likely represent the disturbed remnants of features located within Site Complex 50-80-07-776 (originally identified during the Makaha Valley Historical Project) and have, therefore, been designated State Site # 776(5793). These include a bifaced core filled wall, a pavement and a small platform (Elmore, Moore and Kennedy 2000).

Wai'anae Kai Ahupua'a

Several sites were recorded by Thrum (1906) and McAllister (1933) in Wai'anae Kai Ahupua'a. These included numerous *heiau* now destroyed [Puupaheehee Heiau (Site 152), Keaupuni Heiau (Site 155), Kahoalii Heiau (Site 156), Malaihakoa Heiau (Site 157), Kikahi Heiau (Site 158), Kalamaluna Heiau (Site 159), and Kane Heiau (Site 160)]; Puehu Fishpond (Site 154); three extant *heiau* [Kuilioloa Heiau (Site 153), Kamaile Heiau (Site 161) and Punanaula Heiau (Site 165)]; a burial cave (Site 162); house sites (Sites 163, 164 and 166); and two sites at Kawiwi with mythological associations (Sites 167 and 168, discussed above).

One of the extant *heiau* is located near the Kaulawaha Road corridor of the current subject property. Site 161, Kamaile Heiau, is located on the *makai* slope of Kamaile'unu Ridge,

and includes small internal enclosures and terraces (see Plate 2). This site is situated on the boundary of Makaha and Wai'anae Ahupua'a. McAllister gives a detailed description of his observations of this *heiau*, and refers to a cave shelter (Site 1185), a spring, and a historic plantation camp which are located in the vicinity of the current subject property:

The *heiau* is a single terrace, built of large, sharp lava rocks. The facings of the terrace are surprisingly even and were carefully fitted. The *heiau* was formerly paved with small bits of coral, giving it the appearance of fine, white gravel. The amount of such coral is surprising. ... Thrum (79,4) offers the following information: "A medium sized *heiau* of platform character and *pookanaka* class, still in fair condition, to be seen from the road on the bluff above the pipe line of the electric pumping station."

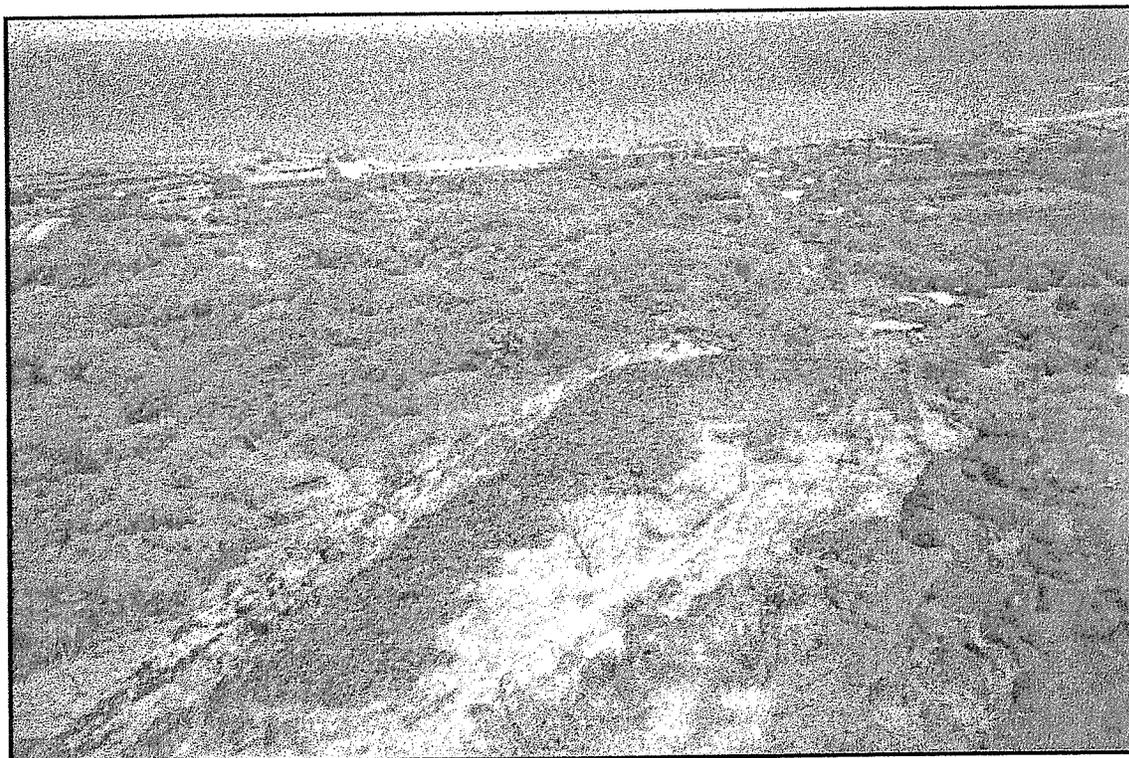
Beneath the *heiau*, but still above the pump, is a shallow cave shelter known as *Kukaauau*. The entrance, which faces due south, is concealed by a large *kiawe* (algaroba), some cactus, and *haole koa*. The cave is approximately 40 feet deep and 25 feet wide and 10 feet high at the entrance. It might prove interesting if excavated because it is on the ridge back of what was once a large Hawaiian settlement. The famous *Kamaile* spring, known as *Kekoo*, which watered many acres of taro land (73 just before it was taken over by the plantation) between the ridge and *Mauna Lahilahi*, was near the base of the shelter. The cave has the appearance of being artificially filled in, for the dust of the floor does not appear to have dropped from the roof. On the floor are many bits of matting, broken gourds, straw, and a few pages from a book printed in Hawaiian which appears to be portion of a catechism. About one-third of the way in, on the right-hand side facing into the cave, a small hole 6 inches deep was made with a stick and a torn part of "Ka Hae Hawaii," dated Mei 14, 1856, was found. These cut pieces are in surprisingly excellent condition; the paper is not even yellow or fragile. The paper has been cut with a scissors or knife. A number of *tapa* (*kapa*) fragments were found; one a brick-red color. The floor is covered with grasses, ti leaves, banana and a few broken bottles. Near the back of the cave was a hole 2 feet in diameter and about 1 foot deep. Though there is a small plantation camp at the base, the shelter is probably not often frequented now.

Sterling and Summers (1978:73) give an additional description of the spring at *Kamaile* in an excerpt from *Nupepa Kuokoa*, August 11, 1899:

... We moved over the plain of *Kamaile*. *Mauna Lahilahi* was on our left. That was the hill on which *Hulumaniani* the reader of omens and prophet from *Kauai* stood and saw a rainbow arched on the upland of *Kukaniloko*, when he was seeking *Laiekawai*. I saw a wooden flume from *Kamaile* to the upland of *Waianae*. The source of the water supply is here at *Kamaile*, and the water is pumped by electricity up a wooden flume to the upland. The electric plant is just above *Waianae*.

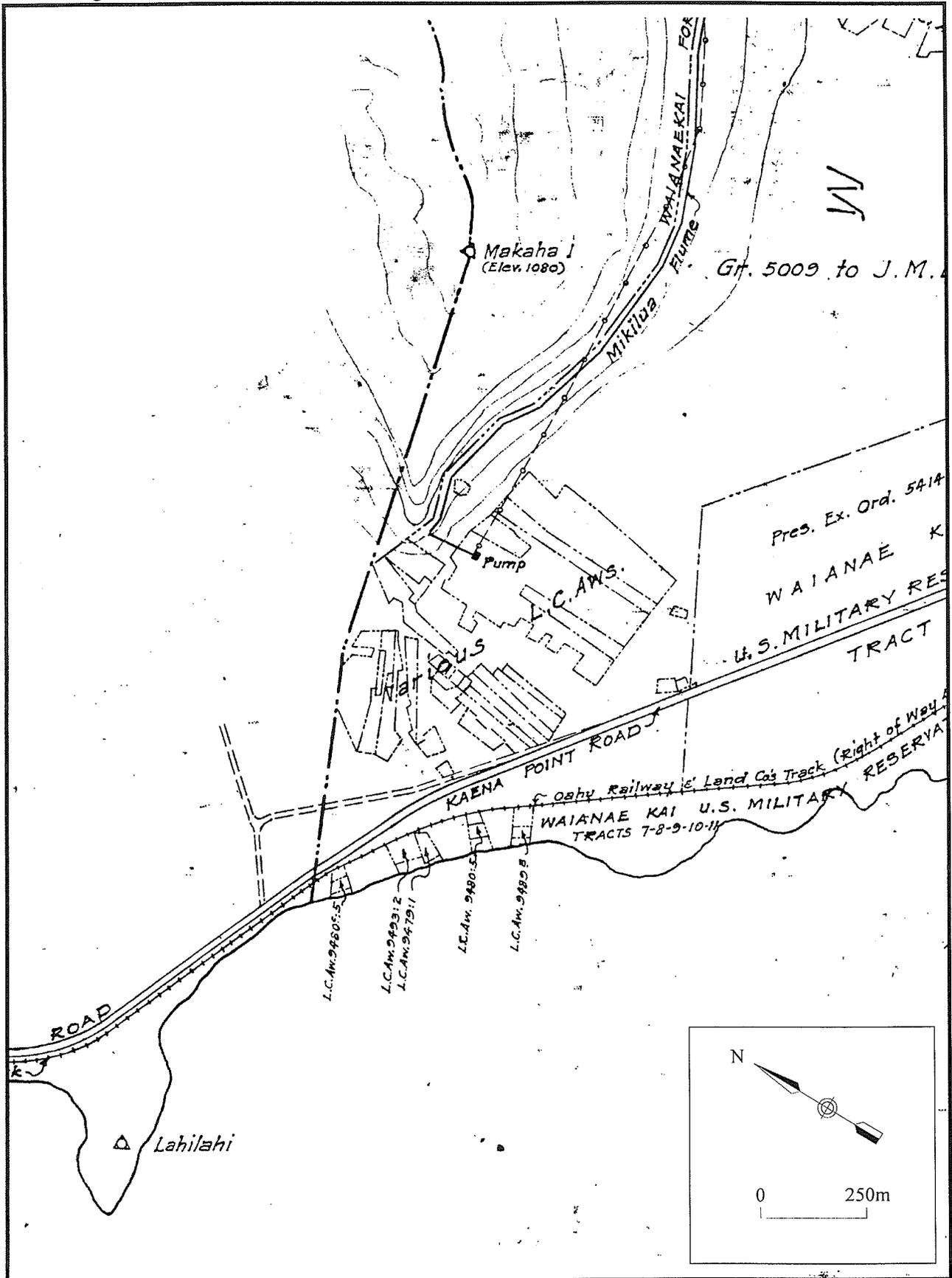
Cordy (1998:22) notes that during the time of the *Mahele*, 138 acres below the spring were cultivated in *lo'i*, and houselots and dryland agriculture lots were present "on the back edges of the *kalo* marsh" and closer to the coast. These lands (LCAs listed in Table 1) may be seen on a 1938 map of *Wai'anae* (see Figure 4), however, specific LCA numbers are not included on this map, nor on the *TMK* map for this area. The flume mentioned in *Sterling and Summers* (*ibid*), called *Milikua*, is also depicted on this map. An historic map of *Makaha*, circa 1855-1884, depicts a coconut grove at the base of *Kamaile'unu* ridge (see Figure 5). No dates have been obtained from the *Kamaile* area.

Plate 2: View of Kamaile Heiau (Site 161) from Above



View Facing Southwest

Figure 4 : 1938 Map by L.M. Whitehouse Depicting L.C.A.s in Kamaile



Waianae Coast Emergency Access Road

source: L.M. Whitehouse 1938

Hommon (1978) recorded the Wai'anae (Kamaile) Complex (Site 1181) in a letter report which includes Kamaile Heiau (Site 161), Kuka'au'au cave shelter (Site 1185) and numerous platforms and a C-shaped enclosure (Site 1190). This site complex has been placed on the National Register of Historic Places (refer to Appendix A). A very rough sketch of the site complex is included with the report. Not shown on the map are a series of historic retaining walls which Hommon describes:

Makai of the pumping station are a series of retaining walls, some of which are directly associated with an old ditch or flume ... Some of these walls might be pre-contact, since they are of old style, but high grass prevented detailed investigation. Portions of these walls were evidently destroyed by the pumping station construction (1978:1).

Hommon also observed rectangular stone alignments and a spring (likely Keko'o spring) below the pumping station (also not shown on the sketch map):

Makai and somewhat downhill from the pumping station are at least three stone and mortar lined rectangular pit walls built by the plantation now partly filled with rubbish, including small appliances and car parts. Nearby, a spring rises from the ground, flows perhaps 75 meters, then sinks into the ground again. The water appears clear and the output is strong, and, according to Glenn, permanent. The lushness of the vegetation testifies to the water-wealth of this land. It is not surprising that this Kamaile 'ili was so productive in taro... The flow of this spring undoubtedly much stronger in days past (specifically the time of the Mahele). Traces of the old taro *lo'i* may yet remain here, though disturbance seems extensive.

The stone and mortar features were reidentified later during a survey of a parcel further to the east (Flood et al. 1994, see below). These may possibly represent habitation structures.

Kane Heiau (Site 160)(see Figure 5) was also located in the vicinity of the current subject property, at the base of Kamaile ridge at the south edge of what was once *lo'i* fields. Though no longer present at the time of McAllister's investigation (1933:114), its location was still known:

The approximate location in the cane field was pointed out, but all the stones have been moved. The full name is said to be Kane-i-ka-pua-lena. This is the heiau at which Kawelo is said to have stopped and offered sacrifices when on his way to Kauai to wage war on Aikanaka (85, p. 183). Some legends say that Kawelo stopped at the Makaha heiau known as Kaneaki (Site 170).

Since the 1960s, Wai'anae Kai has been the focus of a large number of formal archaeological investigations (refer to Table 2). Due to the large number of reports, these reports will not be individually discussed. The reader is referred to Flood et al. (1994) who provide a synthesis of the archaeological findings in Wai'anae Kai. Following is a summary of general findings according to geographic location.

The coastal region has been utilized for habitation from as early as AD 1100-1300 (Cordy 1998; Hammatt et al. 1985 and Riford 1984). Puehu Fishpond and limestone sinkholes in the coastal area were utilized (Denham, Kennedy and Reitsema 1992; Sinoto 1975a). A cluster of *heiau* surrounded by a habitation complex was present in the 'ili of Pu'u Kahea (Cordy 1998).

**Table 2: Previous Archaeological Investigations in
Wai‘anae Kai Ahupua‘a**

<i>Reference</i>	<i>Type of Investigation</i>	<i>Location of Project</i>
Chapman 1967	Reconnaissance	Valley floor
Rosendahl and Rosendahl 1973	Inventory Survey	Valley floor
Sinoto 1975	Inventory Survey	Valley floor
Sinoto 1975	Reconnaissance	Coast
Hommon 1978	Reconnaissance	Valley slopes
Sinoto 1978	Reconnaissance	Valley slopes
Sinoto 1979	Reconnaissance	Valley slopes
Tao 1979	Data Recovery	Coast
Yent and Griffin 1979	Reconnaissance	Valley slopes
Ahlo 1980	Reconnaissance	Valley slopes
Bordner 1981	Reconnaissance	Valley slopes
Ota 1981	Reconnaissance	Valley slopes
Rosendahl 1981	Inventory Survey	Valley floor
EISC 1982	Reconnaissance	Valley slopes
Chiniago 1982	Reconnaissance	Valley slopes
Neller 1982	Reconnaissance	Valley slopes
Riford 1984	Data Recovery	Coast
Hammatt et al. 1985	Data Recovery	Coast
Hammatt et al. 1987	Data Recovery	Valley slopes
Rosendahl and Shapiro 1988	Inventory Survey	Valley floor
SRSC 1988	Reconnaissance	Valley slopes
SRSC 1989	Reconnaissance	Valley slopes
Masse 1989	Reconnaissance	Valley floor
Denham et al. 1992	Inventory Survey	Coast
Flood et al. 1994	Inventory Survey	Valley floor
Schilz et al. 1994	Data Recovery	Coast
Kolb et al. 1995	Inventory Survey	Valley slopes
Devereux et al. 1997	Reconnaissance	Valley slopes
Borthwick et al. 1999	Data Recovery	Coast

Kane‘ilio Point was used for both residential and ritual purposes at Ku‘ilioloa Heiau. Numerous burials have been found at Poka‘i Bay (Riford 1984 and Hammatt et al. 1985).

Habitation, agriculture and ritual use occurred in the valley floor during pre-Contact times (McAllister 1933; Rosendahl and Rosendahl 1973; Rosendahl and Shapiro 1988; Rosendahl 1981; Masse 1989). Post-Contact ranching, sugar production and modern development have disturbed these sites to a large extent.

The valley slopes have been found to contain numerous *lo‘i* terraces, stone walls, ‘*auwai*, and possible house sites (Ahlo 1980; Hammatt et al. 1987; Neller 1982; Ota 1981; Sinoto 1978; Sinoto 1979; Bordner 1981; EISC 1982; Chiniago 1982; SRSC 1988 and SRSC 1989).

Lualualei Ahupua‘a

A large percentage of Lualualei Ahupua‘a has been the subject of previous archaeological investigations. Thrum (1906) and McAllister (1933) were the first to investigate archaeological sites in this area. Few sites were identified in this *ahupua‘a* in comparison with Wai‘anae Kai Ahupua‘a.

Site 148, located to the south of Pu‘u O Hulu, consists of a large stone named Maui, “said to be named after the Hawaiian hero, Maui, who is said to have landed here when he first came to the Hawaiian islands from the south” (McAllister 1933:110). Site 149, Nioiula Heiau, is located in the uplands of the valley. The *heiau* was paved and walled, and reported to have been partially destroyed at the time of McAllister’s investigation. The *heiau* “is said to have been very ancient, belonging to the chief, Kakuihewa” and was later used as a cattle pen (ibid). Site 150, also located in the far uplands of the valley, consisted of several walls and terraces, which were either house sites or agricultural terraces. This site suffered disturbance by grazing cattle. Site 151, Kakioe Heiau (now destroyed) was located in the uplands of the valley in Puhawaii. According to Thrum, this was “a small heiau of which nothing now remains but its sacred spring, and the sound of its drums and conchs on the nights of Kane” (Thrum in McAllister 1933).

More recent archaeological investigations have been conducted in the *ahupua‘a*. Investigations along the coast found evidence of habitation deposits, burials and military use along the shoreline. However, a Reconnaissance Survey by ACH (Kennedy 1983) on the *makai* slope of Pu‘u O Hulu Kai found no archaeological sites.

Seven burials were identified in beach sand during a monitoring project on Liopolo Street fronting Maili Beach Park (Hammatt and Shideler 1991).

Following the recommendations of a Reconnaissance Survey which identified a subsurface cultural deposit (Dega 1998), an Inventory Survey of 57.65 acres at Ulehawa Beach Park was conducted by Cultural Surveys Hawaii (McDermott and Hammatt 2000), part of which

covers a portion of the Nanakuli Improvements corridor of the current subject property. Four sites were identified, including a portion of the O.R. & L. Railroad (Site 50-80-12-9714), structures associated with WWII (Site 50-80-07-5761) and two likely prehistoric and/or early historic subsurface cultural deposits (Sites 50-80-07-5762 and 5763). The O.R. & L. line runs alongside the current subject property. A WWII bunker (5761A) is also located along the beach adjacent to the current subject property. These sites are not located within the subject corridor.

Projects located on the valley floor encountered mostly modern sites. An investigation by Barrera (1975) of 70 acres north of Pu'u O Hulu identified six sites including a religious structure, a C-Shaped enclosure, two house sites, a possible site and a midden scatter. The religious site was later determined to be modern in origin in an adjacent investigation of 130 acres by Cordy (1975). Cordy noted that the property had suffered much damage by cattle grazing and bulldozer activity related to stone quarrying. Nineteen previously unrecorded sites were identified, including walls, highly disturbed sites and modern sites.

Fourteen out of the twenty-five sites recorded by Barrera and Cordy were later reidentified (the remaining sites were likely destroyed in the interim) during a Reconnaissance Survey conducted at 415 acres comprised of the northern slopes of Pu'u O Hulu and extending to the north into Maili (Mayberry and Rosendahl 1994). The project area includes the Pakeke Street/Hakimo Road Connector corridor of the current subject property. Twenty-six additional sites were recorded, twenty-four of which dated to the twentieth century. These included agricultural complexes, industrial complexes, water storage complexes, a well, boundary walls, stone mounds, a C-shaped enclosure, a bridge, stone platforms and three features believed to be associated with World War II. The C-shaped enclosure and a stone platform, as well as the two stone features which were determined to possibly predate the twentieth century, were subjected to additional testing (Jimenez 1994). Cultural deposits related to WWII were identified at Site 3339 (enclosure and wall on the slope of Pu'u O Hulu Uka). Sites 3344 and 3755 (stone platforms) were determined to be modern clearing mounds. Site 3750 (C-shaped enclosure) was determined to be a temporary habitation dating to AD 1426-1676.

An Inventory Survey of five acres between Pu'u O Hulu Uka and Ulehawa Stream found no archaeological sites (Chiogioji and Hammatt 1993).

A Reconnaissance survey of 260 acres identified only three sites: a sugarcane production complex, a traditional habitation site and a traditional stone mound (Robbins and Anderson 1998).

Investigations on the valley slopes encountered varying results. No sites were found during a Reconnaissance Survey of the northern slopes of Pu'u Heleakala (Bordner 1977). An adjacent survey to the west found two traditional sites (a habitation complex and a stone wall) and six historic sites (a cattle wall, a furnace, wells, a house lot, and a cement foundation)(Hammatt et al. 1993).

Two investigations were conducted which covered the entire inland half of the *ahupua'a*. A Reconnaissance Survey of 8884 acres identified 131 sites comprised of 1004 associated

features (Haun 1991). Features included “alignments, C-shapes, L-shapes, U-shapes, walls, terraces, enclosures, mounds, platforms, walled terraces and paved terraces” (ibid 1991:vii). Clusters of habitation sites were identified in the valleys of Halona, Pahoia and Puhawai. This project area was further addressed in a Cultural Resource Review Survey along with additional land on the peripheries and properties at West Loch and Waikele (Ogden 1997). In this report, 597 sites were reviewed. One site within Lualualei Ahupua‘a, Nioiula Heiau, was listed on the National Register of Historic Places.

Nanakuli Ahupua‘a

A substantial amount of archaeological investigations have been conducted in the lower and upper valley portions of Nanakuli Ahupua‘a. Thrum and McAllister conducted the earliest investigations in the *ahupua‘a*, recording the location of Ilihune Heiau (Site 147, no longer present) towards the base of Pu‘u Heleakala. Thrum describes it as a “small walled heiau of pookanaka class; used about 1860 by Frank Manini as a cattle pen, for which natives prophesied his poverty and death” (Thrum in McAllister 1933). Handy (1940) conducted an investigation in the upper valley area and found ruins of stone terraces, platforms and pavements.

More recent archaeological Inventory Surveys have been conducted in undeveloped lands in the upper and lower valley areas (Cordy et al. 1990; Cordy and Pak 1990; Cordy 1993; Cordy 1997; McDermott and Hammatt 1999). The lower valley areas contained substantially fewer sites in comparison with the upper valley. The upper portion of the valley was found to contain numerous archaeological sites including agricultural features, temporary and permanent habitations, large enclosures, activity areas, and two possible religious sites (a small shrine and a possible *heiau*) (Cordy 1997).

An investigation in 1994 by Aki Sinoto Consulting noted extensive land alteration, and indicated that the expected findings would primarily include post-Contact agriculture, ranching and military sites (Nakamura and Pantaleo 1994).

An investigation was conducted the following year by Ogden Environmental and Energy Services Co. for the Department of the Navy (Schilz, Hurst, Shun, Clevenger, Pietruszewsky, Weisler and Ziegler 1995). The project was located on the south side of Nanakuli Stream *makai* of Farrington Highway, near the southeast end of the Nanakuli Improvements corridor of the current subject property. This investigation found no archaeological sites.

Though no sites were found during the coastal investigations in Nanakuli, scattered settlements are indicated in historic accounts:

Archival records—although very limited—show that there was a settlement along the coast in Nanakuli. In the early 1800s, John Papa I‘i visited his aunt here. Although he described very little of the coastal settlement, he did note that breadfruit trees were present. Also, his relatives were supervising “the fishing” at that time in the village.¹²⁸ Others passed through Nanakuli

walking from Waimanalo Gulch in 'Ewa on their way to Wai'anae valley. They provided general descriptions for the area from Nanakuli through Ulehawa and Ma'ili in Lualualei, without specifics. They noted houses were present on the shore. In 1818 Hunnewell walked by a "number of Indian villages," and in 1828, Chamberlain recorded that, "We passed several kauhale (clusters of houses)".¹²⁹ (Cordy 1998)

Section 3.3: Settlement Patterns

Based upon the land use and archaeological studies mentioned above, settlement patterns for the *ahupua'a* of Makaha, Wai'anae Kai, Lualualei and Nanakuli can be briefly summarized. (A detailed summary of the settlement patterns for each of these *ahupua'a* may be found in Cordy's (1998) *Ka Moku o Waianae: He Mo'olelo O Ka Wa Kahiko*.) Patterns of settlement for these *ahupua'a* would have been somewhat similar, though occurring at differing times. The earliest settlements of the valleys began with small coastal populations utilizing littoral resources. Permanent habitation settlements then grew along the swampy back sides of the dunes and along the coastal trail which roughly follows the route of Farrington Highway. By the 13th Century, the populations had begun utilizing the inland portions of the *ahupua'a*. A change in the distribution of populations occurred in the following centuries when inhabitants moved from the coast to new population centers in the interior of the valleys where scattered clusters of permanent habitation sites are found in the areas surrounding Kaneaki Heiau in Makaha; along Kaupuni Stream and the 'ili of Pu'u Kahea and Kamaile in Wai'anae Kai; in the upland valleys of Halona, Pahoa and Puhawai in Lualualei; and across the upper valley floor of Nanakuli. Several factors are cited as influencing this shift in the centers of population, the most compelling of which is proximity to agriculturally productive areas.

The post-Contact Period saw a decline in the native Hawaiian population followed by the abandonment of the traditional irrigated taro systems. In the late 1800s to early 1900s, the large scale cultivation of sugarcane expanded onto the seaward portions of the valley floors. A list of taxpayers and contributions were recorded in 1855 by a tax collector named J.W. Makalena (McGrath et al. 1973:29). McGrath et al. (ibid) discuss these figures:

This list of taxpayers, generally adult males, provides a clue as to how the population of the Waianae Coast was distributed at that time. Here are the figures:

Waianae Kai	62
Kamaile	44
Makaha	38
Makua	21
Maili	9
<u>Nanakuli</u>	<u>8</u>
Total	182

If we assume a population of less than 800 for the area, and four persons to the average household, the number of taxpayers in Waianae Valley represent about 250 persons. We can also

estimate that about 175 people lived at Kamaile, about 150 in Makaha Valley, almost 85 in Makua Valley, more than 35 in Maili, and over 30 in Nanakuli.

... There were two schools in Waianae Valley, each with about 25 students. ... the people of Nanakuli paid a total of \$26 for school, poll and other taxes. Maili paid in \$31. In Makua, the people paid \$73.50; in Makaha, \$92.25; at Kamaile, \$177; and in Waianae Valley, \$276.

From Makalena's records, it was also revealed that in some areas there were more horses than taxpayers. In Wai'anāe Valley, 123 horses and nine mules and donkeys were reported; 66 horses and four mules and donkeys in Kamaile; and 10 horses in Nanakuli (ibid).

In recent years, modern residential and recreational developments have obscured earlier deposits.

Section 3.4: Expected Finds

Based upon the land uses, previous archaeology and settlement patterns discussed above, the expected finds for the various portions of the subject property may now be discussed.

Kaulawaha Road Corridor: This portion of the subject property, extending from Makaha into the *'ili* of Kamaile in Wai'anāe Kai Ahupua'a, lies within an area in which diverse archaeological sites are likely to be found. As mentioned above, the Kamaile area was previously investigated by Hommon (1978), who recorded Kuka'au'au Cave, Kamaile Heiau, a retaining wall, a number of platforms and a C-shaped enclosure which are located near the subject property. Keko'o spring, one of the most important sources of water in Wai'anāe, is located on the slopes directly above the subject corridor. *Lo'i* was cultivated on the lands below the spring, and gleyed soil deposits may be present. A Hawaiian village was purportedly located at the back of the *lo'i* fields at the base of the slope, and stone platforms, pavements and enclosures may be present. Cultural materials associated with habitation such as midden, lithic tools, etc., could also be encountered. Remnants of the historic plantation camp mentioned by McAllister may also be extant. *'Auwai* or flumes associated with Keko'o spring and *lo'i* fields may also remain. Though Kane-i-ka-pua-lena Heiau was reported by McAllister to have been destroyed, portions of the site or related features may be extant. Although the southeast portion of this corridor lies within a karstic area which would not have been suitable for the cultivation of *lo'i*, the survey of a nearby property (Flood et al. 1994) found evidence of pre-Contact habitation in addition to a sugar or railroad camp. A stone wall, an historic artifact scatter, a rubbish mound, an L-shaped enclosure, a boulder slab alignment, a low platform, a small terrace, and modified sinkholes were identified, and similar features may be expected on the current subject property.

Maiu'u/Mahina'au Road Alternate Corridor: The area encompassed by this corridor in Kamaile lies in an area once cultivated in *lo'i*, cotton, and likely sugarcane as well. Gleyed

deposits from *lo 'i* cultivation may remain, though any surface features would likely have been obscured during the cultivation of sugarcane.

Pakeke Street/Hakimo Road Connector Corridor: This corridor lies within an area previously surveyed (Mayberry and Rosendahl 1994; Jimenez 1994). Four sites were identified near the current subject corridor which were comprised of a stone ranching wall (Site 3337), two stone mounds (Site 3338), and two WWII era sites comprised of small enclosures (Sites 3339 and 3340). These sites may fall within the current subject corridor.

Pa'akea Road Corridor: This corridor crosses Ulehawa Stream, which once held a more substantial flow of water. *Lo 'i* deposits or dryland agricultural sites and temporary habitation sites may be present.

Nanakuli Improvements Corridor: The northernmost portion of this corridor at Ulehawa Beach Park has been previously investigated. The O.R. & L. railroad track (Site 9714) is present along this area. A WWII era bunker was also recorded (Site 5761A). Though buried cultural deposits in the sand dune which contained charcoal, fish and bird bones were recorded further up the coast, none were present along the strip of beach which includes the current subject property (Dega 1998; McDermott and Hammatt 2000). The possibility remains that intermittent subsurface deposits may continue into Nanakuli Ahupua'a. Burials may also be encountered, as sand dunes have been commonly used throughout the island for interment of the deceased.

Section 4: Methodology

The current archaeological investigations were conducted on June 20, 2001 and July 9-13, 2001. All fieldwork was conducted under the direction of the Principal Investigator, Joseph Kennedy, M.A.. Fieldwork was conducted by Joseph Kennedy, M.A., Michelle Elmore, B.A., Brad Ostroff, B.A. and Catherine Berdy, B.A.. Fieldwork methods consisted of both surface and subsurface investigations. Cultural Monitors, Stella Enos and her daughter Garnet, accompanied the field crew during subsurface investigations.

A pedestrian survey was utilized to systematically investigate the subject property. The purpose of the pedestrian survey was to identify all potentially significant historic properties which may be located on the surface of the subject property. The pedestrian survey was conducted by having the field crew sweep the parcel on foot using transects spaced approximately 5 to 10 meters (m) apart. Transects ran along the path of the project corridors. Visibility was good with scant, knee to waist high grasses covering the terrain. Through the use of this procedure a 100% surface survey of the subject property was completed and all potentially significant historic properties were identified.

Subsurface investigations were conducted at the Kaulawaha Road and the Nanakuli Improvements corridors. These consisted of two backhoe trenches at the Kaulawaha Road corridor spaced 30 meters (m) apart and a series of thirty-four backhoe trenches at the Nanakuli Improvements corridor generally spaced 50m apart. The purpose of conducting subsurface excavations was to determine if cultural deposits were present and to examine the soil stratigraphy. The results of these investigations would provide information which would allow for the evaluation of potential sites.

A variety of techniques were utilized to ensure proper data collection. The locations of sites, features and trenches across the subject property were mapped with compass and tape from known points found on the property and depicted on a map of the subject property. Soil samples were collected from each stratigraphic layer identified and a profile was drawn of at least one face of each trench. Photographs were taken of features and trenches with representative photographs presented in this document. Notes were taken in the field describing the environmental setting of the subject property including indications of former modifications and/or modern developments made to the property. Detailed field notes were also taken describing all subsurface excavations with a summary of the basic findings from each trench. All of these methods in data collection were conducted in order to provide an accurate and detailed visual and written record of the findings on the subject property.

Laboratory analyses included a range of diagnostic endeavors and were conducted according to standard scientific and archaeological methods and recorded on standardized analysis forms. Descriptions were made of soils according to USDA standards of composition and color.

This report provides complete descriptions of the investigations undertaken including written accounts, placement of the features and trenches on plans drawn to scale, and profiles depicting stratigraphic deposits encountered. Also included are soil descriptions according to USDA standards and the presentation of the results of all laboratory analyses described above. The methods utilized aided in the production of an accurate and detailed report along with a determination of site significance as well as the impact of future construction endeavors.

All materials collected will be bagged and labeled appropriately, placed in labeled and inventoried boxes, and curated at the ACP office located at 59-624 Pupukea Road, Hale'iwa, Hawai'i.

Section 5: Findings

Archaeological investigations conducted by ACP systematically surveyed the entire subject property. The current investigations identified two sites at the Kaulawaha Road corridor: Sites 5949 and 5950. Site 5949 consists of a traditional subsurface deposit containing two features. This site is considered to be associated with the Wai'anae (Kamaile) Complex, which also includes Kamaile Heiau (Site 161), Kuka'au'au Cave (Site 1185) and a cluster of stone platforms and a C-shaped enclosure (Site 1190). Site 5950 contains foundations and a well associated with the Wai'anae Plantation camp and pumping station. Modern cinderblock concrete flumes were observed along the southeast portion of this corridor, but are not considered sites.

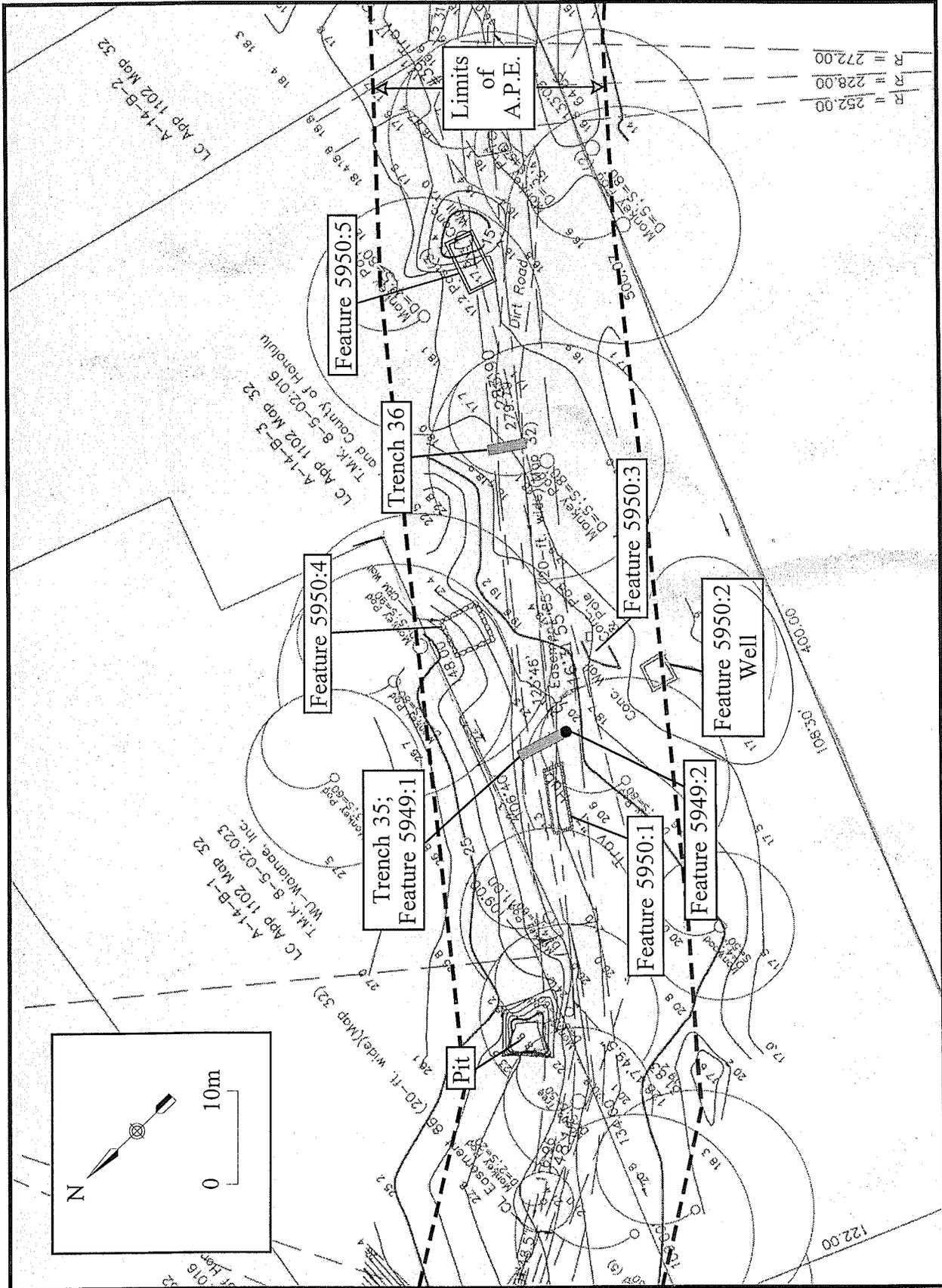
No sites were identified in the remaining corridors. A bifaced core filled wall (Site 3337) which was previously recorded by Mayberry and Rosendahl (1994) was observed roughly seventy meters outside the Pakeke Street/Hakimo Road Connector corridor. The results of all excavations and descriptions of the sites identified within the project area will be briefly described below.

Section 5.1: Trench Descriptions

Thirty-six backhoe trenches were excavated on the current subject property. Two trenches were placed at the Kaulawaha Road corridor and thirty-four trenches were located at the Nanakuli Improvements corridor *makai* of the O.R. & L. railroad (see Figures 6-9). A detailed listing of the findings for each trench may be found in Table 3. The trenches generally ranged from 2-4 meters (m) in length and had a maximum depth of 100-180 centimeters below surface (cmbs). Representative profiles of the trenches may be seen in Figures 10-19.

From the excavations along the Nanakuli Improvements corridor, it was observed that a significant amount of disturbance has occurred along the subject corridor in that area. Twenty-one out of the thirty-four trenches were entirely comprised of fill soils, while the remaining trenches contained at least some or nearly all fill soils. The fill soils are likely related to a deeply buried sewer line which runs much of the length of the corridor. The sewer line trench was apparently quite large and covered much of the width of the corridor, and the edges of this disturbance could be observed in some of the backhoe trenches (see Figure 15). The naturally deposited soil consisted of sand, loamy sand and sandy loam. No cultural materials were observed in these sandy soils aside from occasional modern debris. Possible buried A-horizons were observed in Trenches 2, 5, 6, 7, 30, 31 and 32 (see Plate 3). Coral reef was encountered in Trenches 24 and 25. A blasted trench through the reef was observed which likely contains the sewer line. Trenches 30 and 31 were excavated abutting the O.R. & L. railroad track (Site 9714), and fill soils relating to the construction of the line were observed (see Figure 16). No sites were identified in any of the trenches along the corridor aside from Site 9714.

Figure 6: Plan Map of a Portion of the Kaulawaha Road Corridor Showing Features of Sites 5949 & 5950



source: Gray, Hong, Bills, Nojima & Associates Inc. 2001

Waianae Coast Emergency Access Road

Figure 7: Plan Map Showing the Locations of Trenches 1 Through 13 at the Nanakuli Improvements Corridor

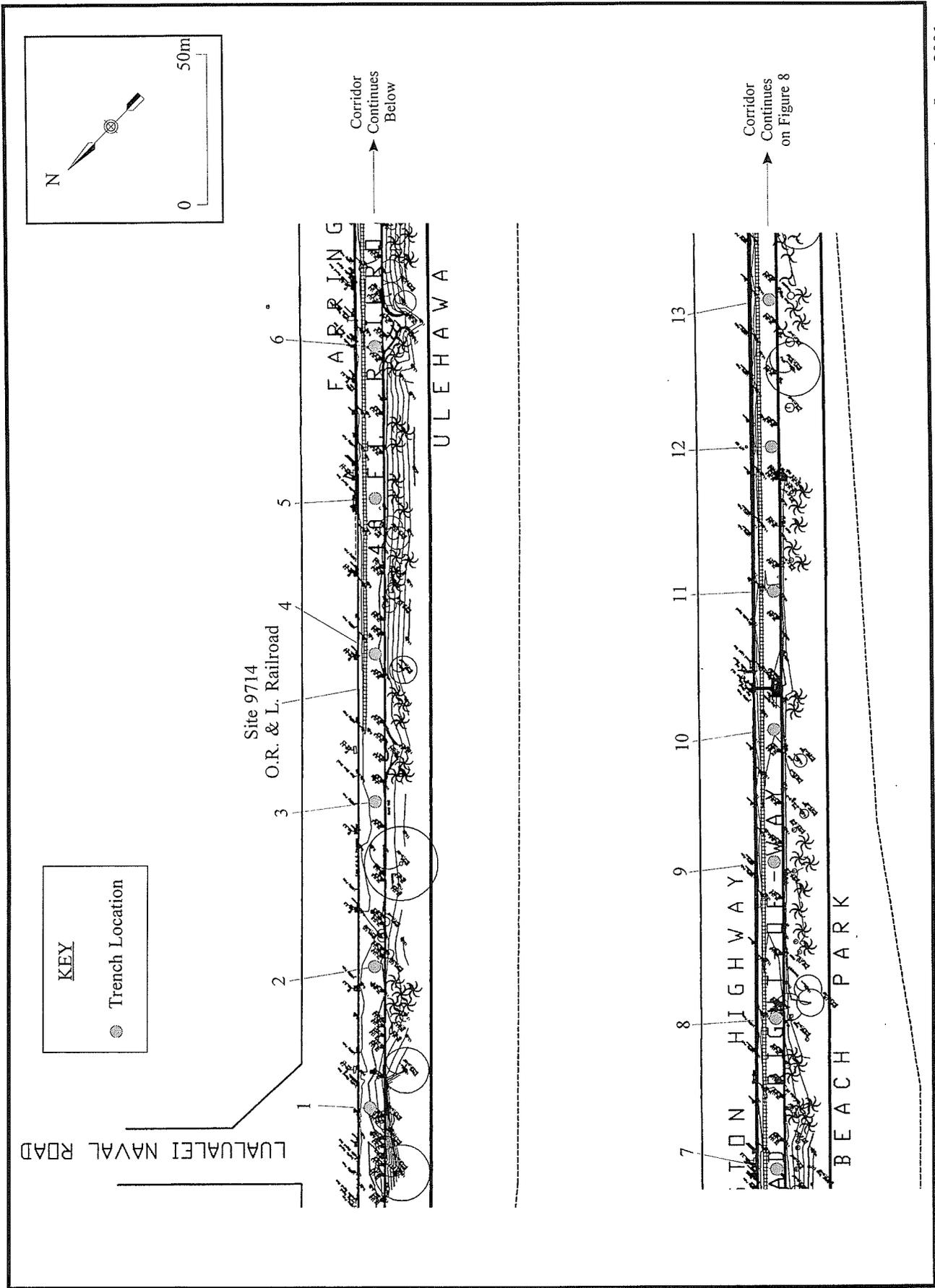


Figure 8: Plan Map Showing the Locations of Trenches 14 Through 24 at the Nanakuli Improvements Corridor

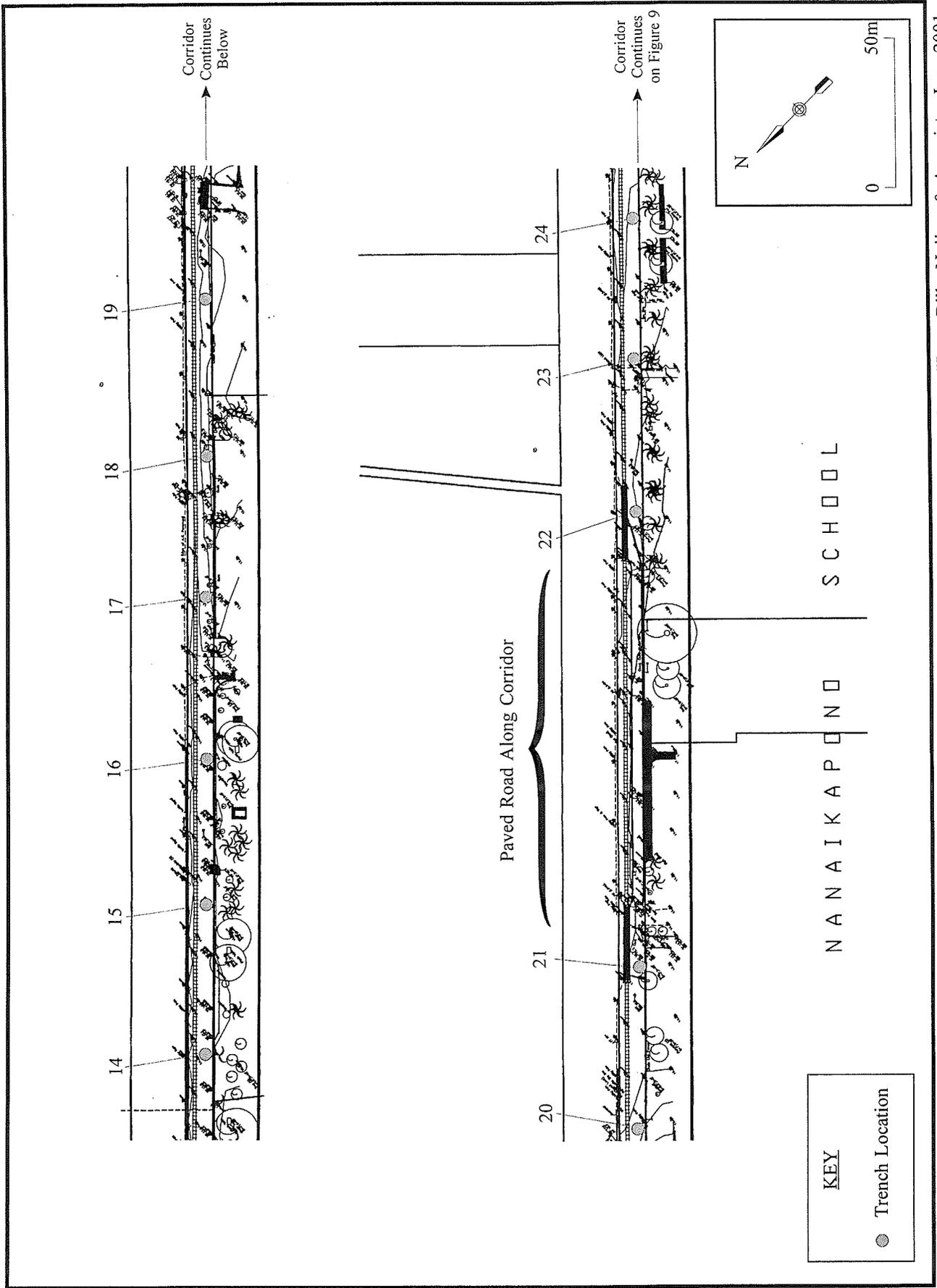


Figure 9: Plan Map Showing the Locations of Trenches 25 Through 34 at the Nanakuli Improvements Corridor

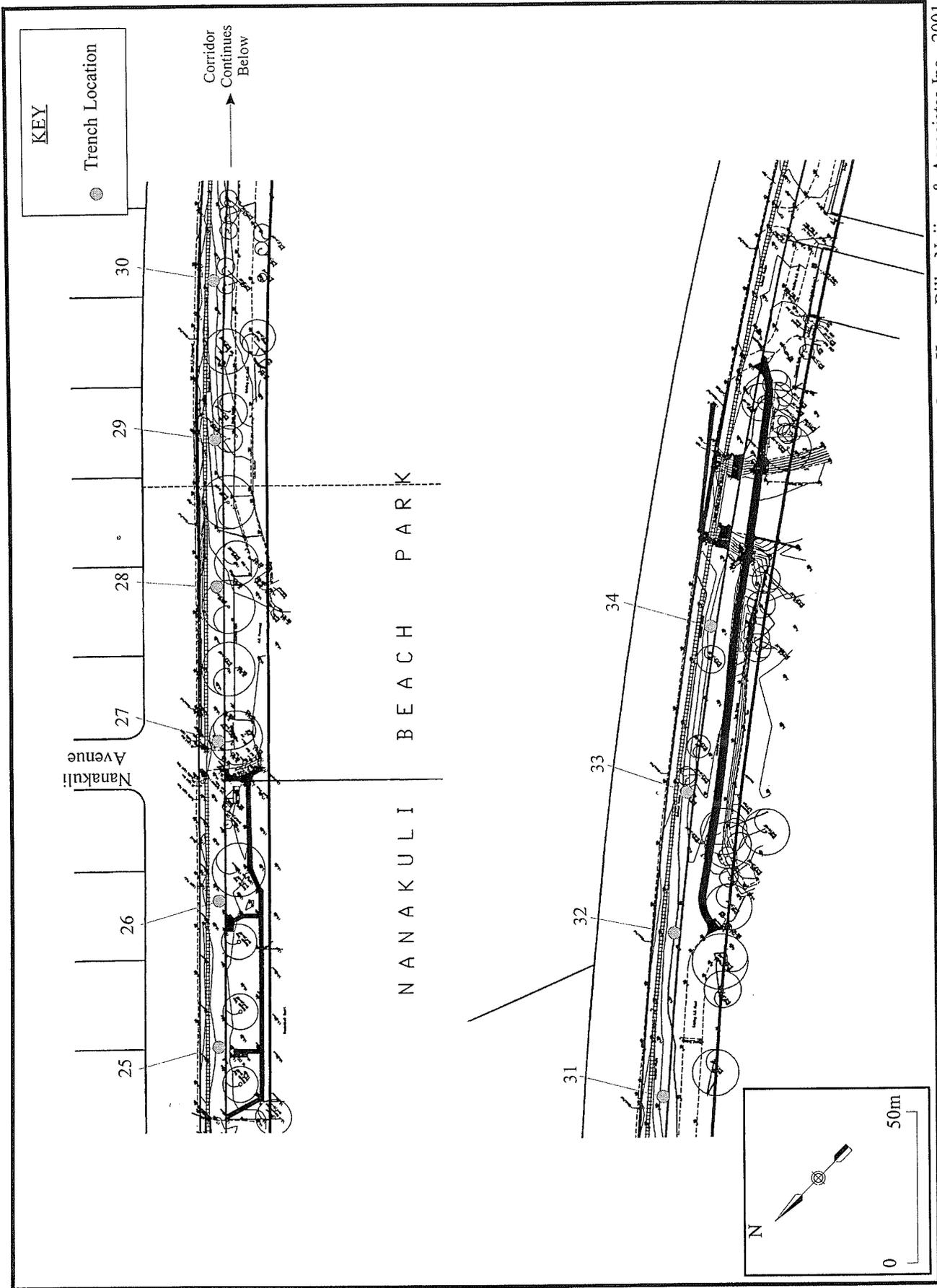


Table 3: Trench Descriptions

Trench	Trench Size (cm)	Maximum Depth (cmbs)	Orientation	Soil Description	Findings
1	100 x 380	180	26/214°	I (0-180): mottled fill soils with coral II (40-90): grayish brown (10YR 5/2) loamy sand lens i (78-82): very dark grayish brown (10YR 3/2) loamy sand III (90-110): light yellowish brown (10YR 6/4) sand IV (110-180): dark grayish brown (10YR 4/2) sandy clay loam	Sand layers are swirled and are non-cultural. These layers may actually represent fill layers rather than naturally deposited strata. No cultural material aside from modern debris in Layers I and II.
2	80 x 340	145	147/327°	I (0-30): mottled fill soils with coral II (30-35): compacted crushed coral III (35-70): mottled/swirled light brownish gray (10YR 6/2) loamy sand and very pale brown (10YR 7/4) sand with charcoal and roots IV (70-90): very dark grayish brown (10YR 3/2) loamy sand swirled with a small amount of light yellowish brown (10YR 6/4) sand V (90-105): dark yellowish brown (10YR 4/4) sandy clay loam VI (105-125): light yellowish brown (10YR 6/4) sand VII (125-145): dark yellowish brown (10YR 4/4) sandy clay loam	Southwest side of trench is comprised of nearly all fill soils. On northeast side of trench, modern fill is present above swirled sand layers. Dark sand layers may be old A-horizons. Sterile sand alternates with sandy clay loam at base of trench on southwest side, suggesting inundation by large wave events. No cultural materials present aside from modern debris in fill layer.
3	80 x 330	145	45/225°	I (0-115): mottled fill soils with coral II (50-93): yellowish brown (10YR 5/4) loamy sand lens i (55-75): very dark gray (10YR 3/1) loamy sand with small amount of charcoal lens ii (85-95): very dark gray (10YR 3/1) loamy sand with small amount of charcoal III (70-145): brownish yellow (10YR 6/6) sand	Trench consists mostly of fill with sand layers below. Lenses in Layer II appear to be disturbances, possibly related to the fill. No cultural materials aside from modern debris in fill layer.
4	80 x 370	135	125/305°	I (0-135): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
5	80 x 380	150	46/226°	I (0-150): mottled and banded fill soils with coral II (70-100): grayish brown (10YR 5/2) loamy sand lens i (98-102): very dark gray (10YR 3/1) charcoal and sand III (95-103): dark brown (10YR 4/3) sandy clay loam IV (120-150): dark yellowish brown (10YR 4/4) sandy clay	Trench contains mostly fill, with sand and clay layers below. Modern debris is present in fill and Layer II. Layer II may be a disturbed old A-horizon. Lens i appears to be a modern disturbance.
6	80 x 380	150	112/292°	I (0-150): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
7	80 x 370	170	29/209°	I (33-57): pale brown (10YR 6/3) sand III (53-100): grayish brown (10YR 5/2) loamy sand IV (100-130): dark gray (10YR 4/1) sandy loam V (130-170): brown (10YR 5/3) sand	Nearly entire trench is comprised of fill. Only the extreme west end of the trench contains sand layers below fill. Dark sand layers may be old A-horizons. No cultural materials present aside from modern debris in fill layer.
8	80 x 370	140	123/303°	I (0-140): mottled fill soils with coral II (83-140): swirled light yellowish brown (10YR 6/4) and light brownish gray (10YR 6/2) sand	Trench is comprised almost entirely of fill, with small amount of disturbed sand at base at north end of trench. Both layers contain modern debris.
9	80 x 290	140	30/310°	I (0-140): mottled fill soils with coral II (0-40): mottled fill with coral III (40-70): very pale brown (10YR 7/3) sand with dark grayish brown (10YR 4/2) sandy loam swirls IV (66-120): light yellowish brown (10YR 6/4) sand	Nearly entire trench is comprised of fill. Only the extreme south end of the trench contains sand layers below fill. Two separated episodes of fill are present. Layer III appears disturbed. No cultural materials present aside from modern debris in fill layer.
10	80 x 360	170	118/298°	I (0-45): mottled fill soils with coral II (45-85): very pale brown (10YR 7/4) sand III (85-170): light yellowish brown (10YR 6/4) sand with tree stain	Northeast side of trench is comprised entirely of fill. Sand layers are present below fill in southwest side of trench. There is a distinct transition between the two sand layers, with tree stain completely truncated, suggesting that Layer II was either brought in as fill, or resulted from inundation by a high surf event. No cultural materials aside from modern debris in fill layer.
11	80 x 340	140	28/208°	I (0-140): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.

Table 3: Trench Descriptions

Trench	Trench Size (cm)	Maximum Depth (cmbs)	Orientation	Soil Description	Findings
12	80 x 370	140	36/216°	I (0-140): mottled fill soils with coral II (50-80): light yellowish brown (10YR 6/4) slightly swirled sand III (80-140): very pale brown (10YR 7/4) sand	Nearly entire trench is comprised of fill. The extreme southwest end of the trench contained sand layers below fill. There is a very diffuse transition between Layers II and III. No cultural materials present aside from modern debris in fill.
13	80 x 320	140	36/216°	I (0-140): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
14	80 x 300	135	36/216°	I (0-135): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
15	80 x 360	130	25/205°	I (0-130): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
16	80 x 360	150	30/210°	I (0-150): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
17	80 x 300	135	30/210°	I (0-135): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
18	80 x 370	140	126/306°	I (0-140): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
19	80 x 400	160	125/305°	I (0-160): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
20	80 x 300	100	119/299°	I (0-100): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
21	80 x 240	140	119/299°	I (0-140): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
22	80 x 360	130	125/305°	I (0-130): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
23	80 x 300	140	130/310°	I (0-140): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
24	80 x 410	130	29/209°	I (0-130): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris. Coral reef encountered at approximately 40cmbs. A previous trench has been blasted through the reef toward the west end of Trench 24.
25	80 x 420	130	45/225°	I (0-130): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris. Coral reef encountered at approximately 50cmbs. A previous trench has been blasted through the reef toward the middle of Trench 25.
26	80 x 310	160	15/195°	I (0-160): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
27	80 x 270	160	51/231°	I (0-160): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
28	80 x 260	160	41/221°	I (0-160): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
29	140 x 260	160	114/294°	I (0-60): mottled/banded fill soils with coral with possible bulldozer scars at base of layer II (50-160): very pale brown (10YR 7/4) sand with band of marine shell fragments	Fill soils above sand. Band of marine shells likely present as a result of wave action. No cultural materials aside from modern debris in fill.
30	200 x 260	160	122/302°	I (0-73): mottled/banded fill soils from railroad II (32-60): brown (10YR 5/3) loamy sand III (60-160): very pale brown (10YR 7/3) sand	Fill related to railroad (Site 9714) above sand layers. Layer II is likely an old A-horizon. Historic materials and coal in Layer I.
31	200 x 200	130	NA	I (0-30): mottled/banded fill soils from railroad II (30-50): brown (10YR 5/3) loamy sand III (50-130): very pale brown (10YR 7/3) sand	Fill related to railroad (Site 9714) above sand layers. Layer II is likely an old A-horizon. Historic materials and coal in Layer I.
32	90 x 160	150	67/247°	I (0-90): mottled/banded fill soils with coral II (50-95): grayish brown (10YR 5/2) loamy sand III (90-150): very pale brown (10YR 7/3) sand	Sand layers present below fill. Layer II is likely an old A-horizon. No cultural materials aside from modern debris in fill.
33	80 x 230	160	30/210°	I (0-160): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
34	80 x 200	140	26/206°	I (0-140): mottled fill soils with coral	Trench is comprised entirely of fill, which contains modern debris.
35	140 x 470	120	0/180°	I (0-15): loose detritus, gravel, stone, coral mixed with very dark grayish brown (10YR 3/2) silty clay loam II (9-90): very dark gray (10YR 3/1) silty clay loam with loose ashy soil III (90-120): dark brown (10YR 3/3) silty clay	Trench excavated at Site 9714, Kamiale Complex. One burial encountered in stone fill matrix within Layer II. Historic and traditional materials present in Layers I and II.
36	80 x 330	120	15/195°	I (0-120): mottled fill soils with coral and small stones II (62-120): very dark gray (10YR 3/1) clay	Trench is almost entirely comprised of fill. A small amount of clay soil at base of trench. No cultural materials aside from modern debris in upper portion of fill layer.

Figure 10: East-southeast Profile of Trench 1

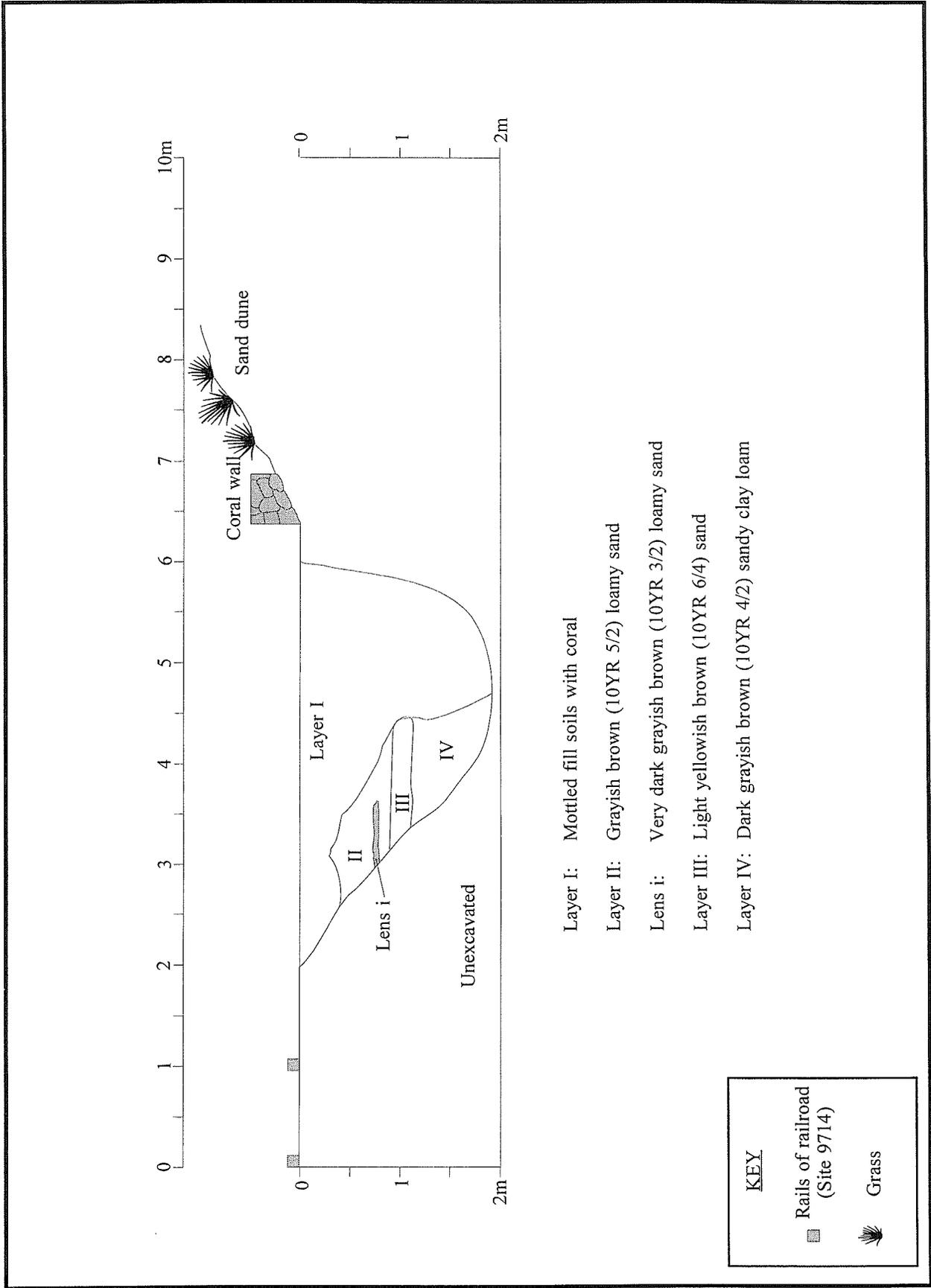
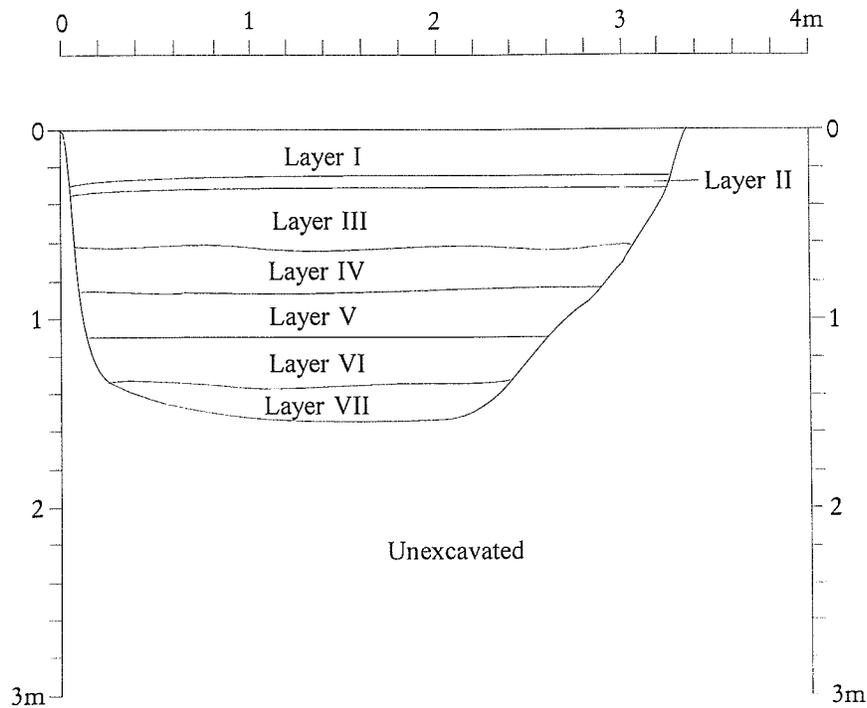
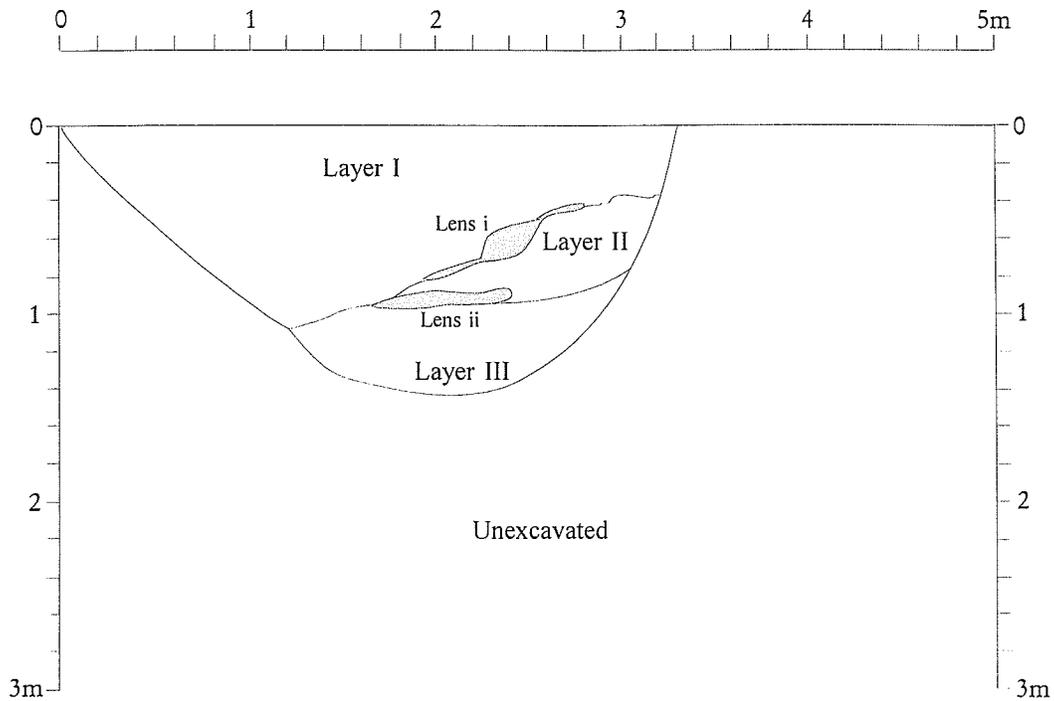


Figure 11: Northeast Profile of Trench 2



- Layer I: Mottled fill soils with coral
- Layer II: Compacted crushed coral
- Layer III: Mottled/swirled light brownish gray (10YR 6/2) loamy sand and very pale brown (10YR 7/4) sand with charcoal and roots
- Layer IV: Very dark grayish brown (10YR 3/2) loamy sand swirled with a small amount of light yellowish brown (10YR 6/4) sand
- Layer V: Dark yellowish brown (10YR 4/4) sandy clay loam
- Layer VI: Light yellowish brown (10YR 6/4) sand
- Layer VII: Dark yellowish brown (10YR 4/4) sandy clay loam

Figure 12: Southeast Profile of Trench 3



Layer I: Mottled fill soils with coral

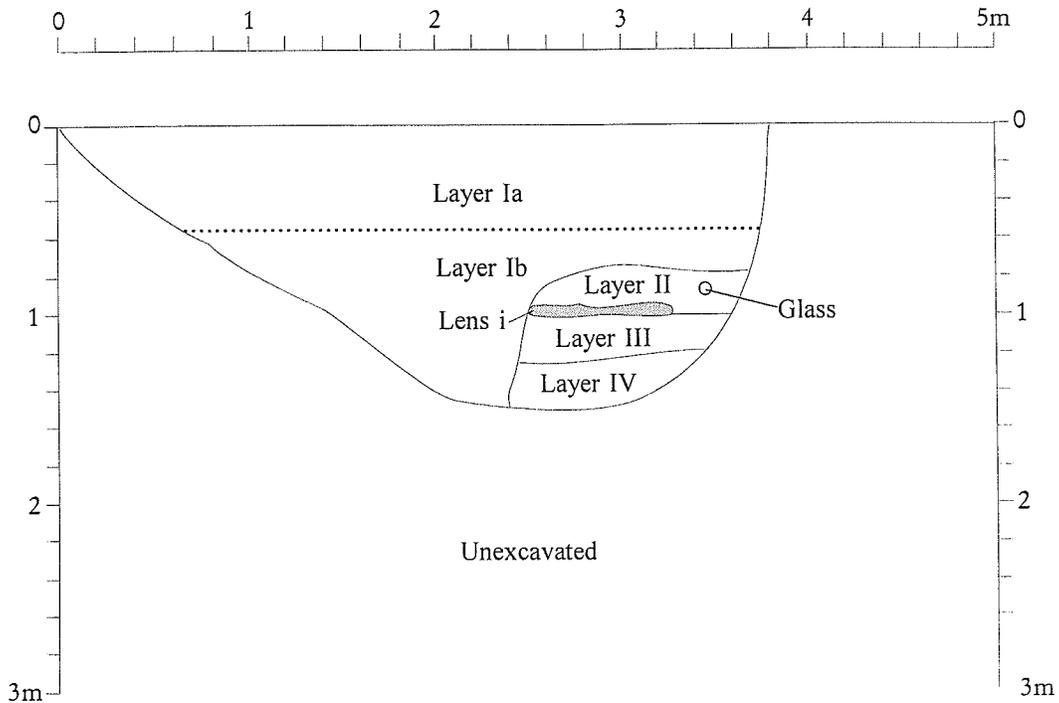
Layer II: Yellowish brown (10YR 5/4) loamy sand

Lens i: Very dark gray (10YR 3/1) loamy sand with small amount of charcoal

Lens ii: Very dark gray (10YR 3/1) loamy sand with small amount of charcoal

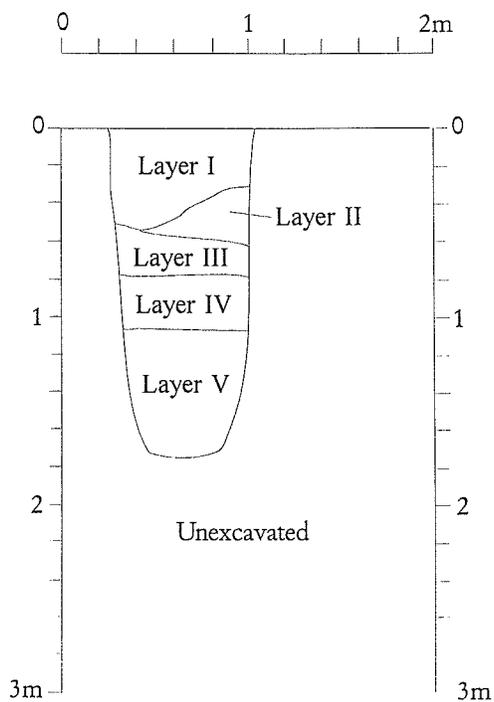
Layer III: Brownish yellow (10YR 6/6) sand

Figure 13: Southeast Profile of Trench 5



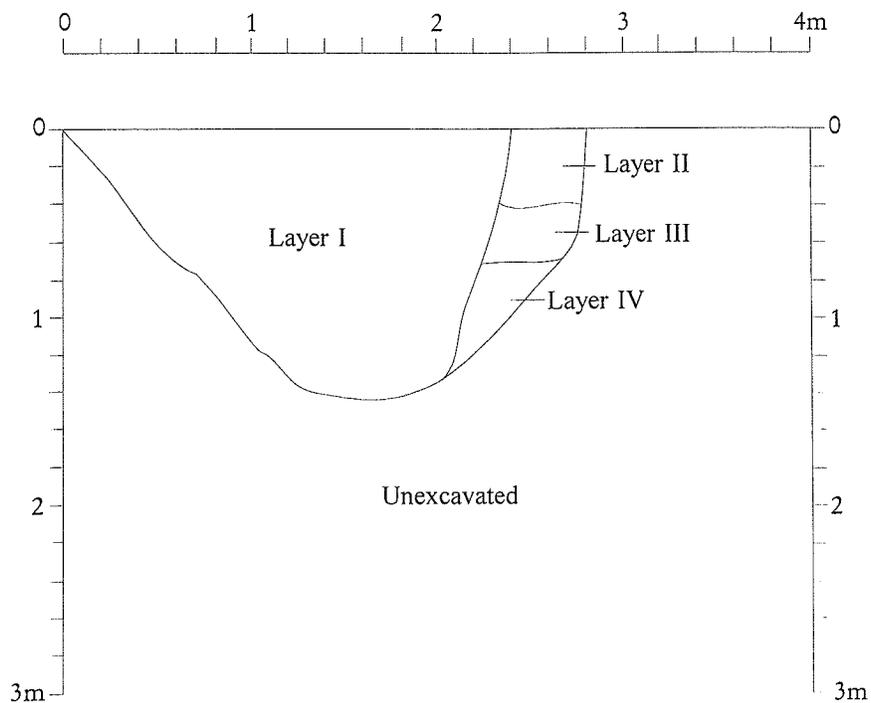
- Layer I: Mottled and banded fill soils with coral
 - Ia - banded sand
 - Ib - grayish brown sandy clay loam and coral w/pockets of sand
- Layer II: Grayish brown (10YR 5/2) loamy sand
- Lens i: Very dark gray (10YR 3/1) charcoal and sand
- Layer III: Dark brown (10YR 4/3) sandy clay loam
- Layer IV: Dark yellowish brown (10YR 4/4) sandy clay

Figure 14: West Profile at End of Trench 7



- Layer I: Mottled fill soils with coral
- Layer II: Pale brown (10YR 6/3) sand
- Layer III: Grayish brown (10YR 5/2) loamy sand
- Layer IV: Dark gray (10YR 4/1) sandy loam
- Layer V: Brown (10YR 5/3) sand

Figure 15: Southeast Profile of Trench 9



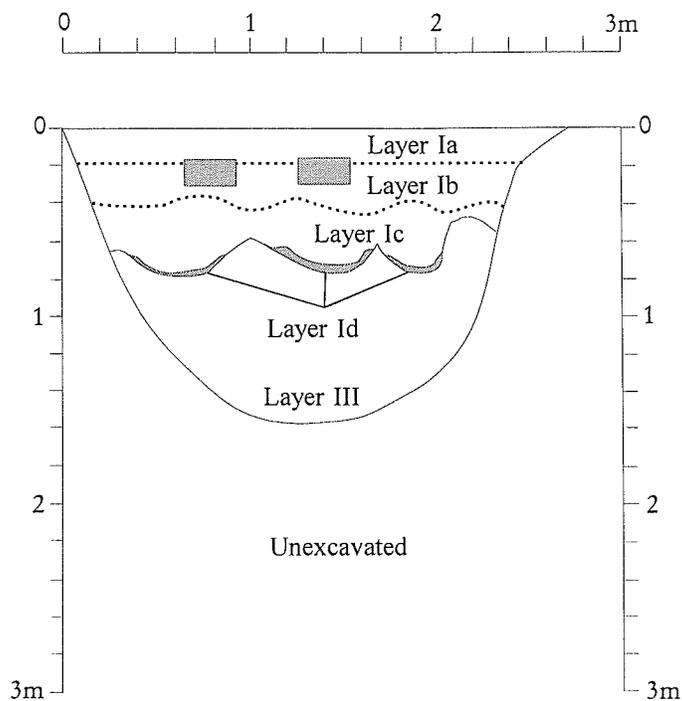
Layer I: Mottled fill soils with coral

Layer II: Mottled fill with coral

Layer III: Very pale brown (10YR 7/3) sand with dark grayish brown (10YR 4/2) sandy loam swirls/bands

Layer IV: Light yellowish brown (10YR 6/4) sand

Figure 16: Northeast Profile of Trench 30



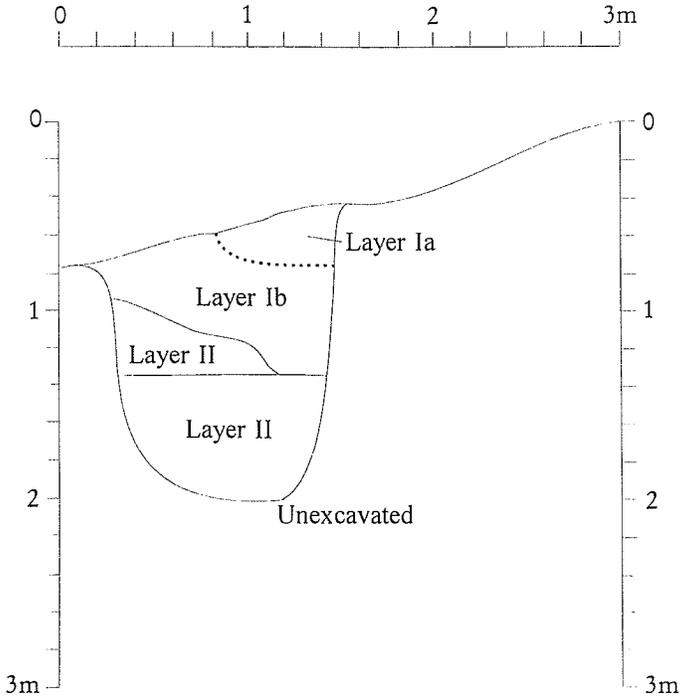
Layer I: Mottled/banded fill soils from railroad
 Ia - dark gray/brown sandy clay with gravel
 Ib - crushed coral and yellow/brown sand
 Ic - grayish brown sand loam with coral and cinder
 Id - very compact gray/light brown sand clay loam

Layer III: Very pale brown (10YR 7/3) sand

[note: Layer II not present in Northeast Profile]

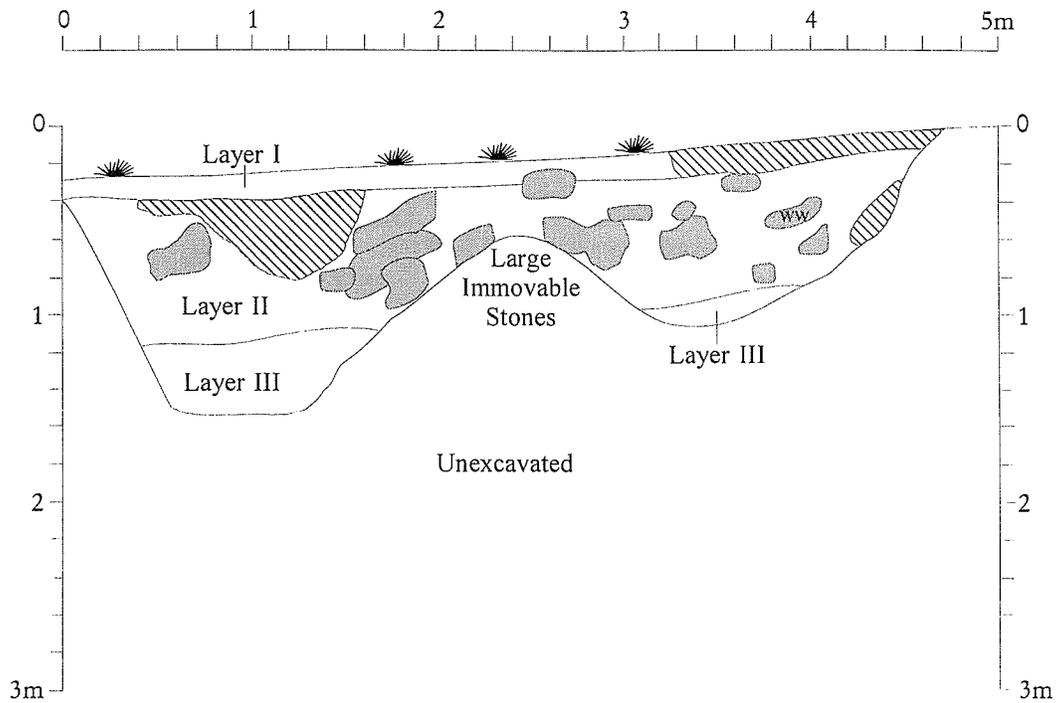
KEY
 Railroad ties,
 Site 9714

Figure 17: North Profile of Trench 32



- Layer I: Mottled/banded fill soils with coral
 - Ia - crushed coral and yellow brown sand
 - Ib - dark yellowish brown silty clay loam
- Layer II: Grayish brown (10YR 5/2) loamy sand
- Layer III: Very pale brown (10YR 7/3) sand

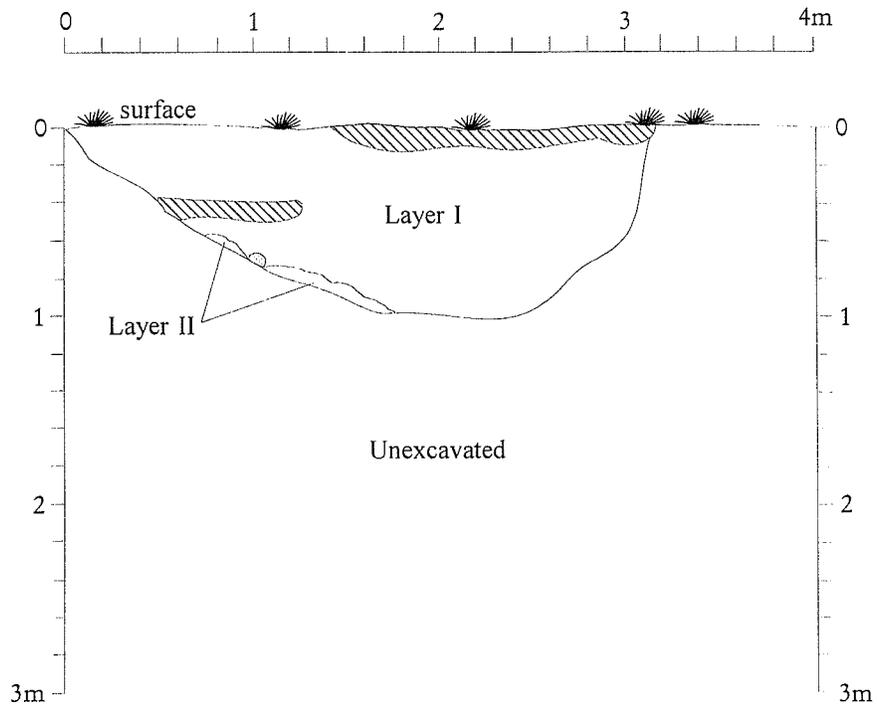
Figure 18: West Profile of Trench 35



- Layer I: Loose detritus, gravel, stone, coral mixed with very dark grayish brown (10YR 3/2) silty clay loam
- Layer II: Very dark gray (10YR 3/1) silty clay loam with loose ashy soil
- Layer III: Dark brown (10YR 3/3) silty clay

KEY	
	Grass
	Waterworn Stones
	Basalt Stones (Feature 5949:1)
	Crushed Coral

Figure 19: West Profile of Trench 36



Layer I: Mottled fill with coral and small stones

Layer II: Very dark gray (10YR 3/1) clay

KEY	
	Grass
	Root
	Crushed Coral

Plate 3: West Profile of Trench 7



The two trenches excavated at the Kaulawaha Road corridor (Trenches 35 and 36) revealed important information pertaining to the use of this area over time. Deposits relating to traditional Hawaiian use of the area (Site 5949) were identified along with disturbances relating to historic use of the property (see Figure 18). The presence of traditional features beneath the trail/roadway implies that this path dates to a latter time, either established in connection with the sugar plantation camp or with the nearby pumping station. [More detailed descriptions of the findings in Trench 35 may be found in the Site Descriptions below in Section 5.2.] Trench 36 was comprised almost entirely of fill soils (see Figure 19). The naturally deposited soil at the base of the trench consisted of clay. From this trench it is apparent that this area has been subjected to a substantial amount of ground-moving disturbance.

Section 5.2: Site Descriptions

Site 5949

Site 5949, located in the Kaulawaha Road corridor of the current subject property, consists of a pre- to early post-Contact period habitation site associated with the Wai‘anae (Kamaile) Complex, Site 1181. This site was identified during the excavation of Trench 35. Subsurface portions of this site likely continue along and outside the project corridor. From the research of the historic background of Kamaile (refer to Section 3), it appears that this traditional deposit is that of the Hawaiian village once located here. No traditional features standing on ground surface were identified within subject corridor.

Trench 35, excavated within the trail/dirt road which follows the project route, revealed the presence of what appears to be a buried stone platform or pavement (Feature 5949:1)(see Figure 18 and refer to Table 4). Human osteological remains of one individual (Feature 5949:2) were encountered within the edge of the stone paving at the south end of the trench (see Figure 20). Sara Collins and Elaine Jourdane of DLNR-SHPD visited the site; treatment of the burial was according to the direction of the DLNR-SHPD and the DLNR-O‘ahu Burials Program. Because of the presence of human remains within the stone pavement/platform, no further excavations were conducted in this area and the horizontal extent of Feature 5949:1 was not determined. The burial was observed to have suffered prior disturbance, as the remains were scattered (including some only a few centimeters below the ground surface) and were previously fractured. *In situ* remains were observed in the face of the south end of the trench. No distinct pit could be observed around the remains. Due to the substantial amount of disturbance, both prior and present, the *in situ* remains were not further excavated, and therefore no plan view was drawn of the remains. All loose osteological material was retrieved from the backdirt, placed in a paper bag and reinterred in the base of the trench below the *in situ* remains. Portions of the individual which were encountered included various longbones, cranium, teeth, vertebrae and feet. Midden materials including shell and animal bone (not collected) were also present in the

Table 4: Summary of Features

Site 5949

Feature	Type	Size (m)	Description
5949:1	platform/ pavement	undetermined (>4.7m in length)	subsurface basalt platform or pavement; top of feature is disturbed
5949:2	burial	undetermined	previously disturbed human osteological remains including various longbones, cranium, teeth, vertebrae and feet

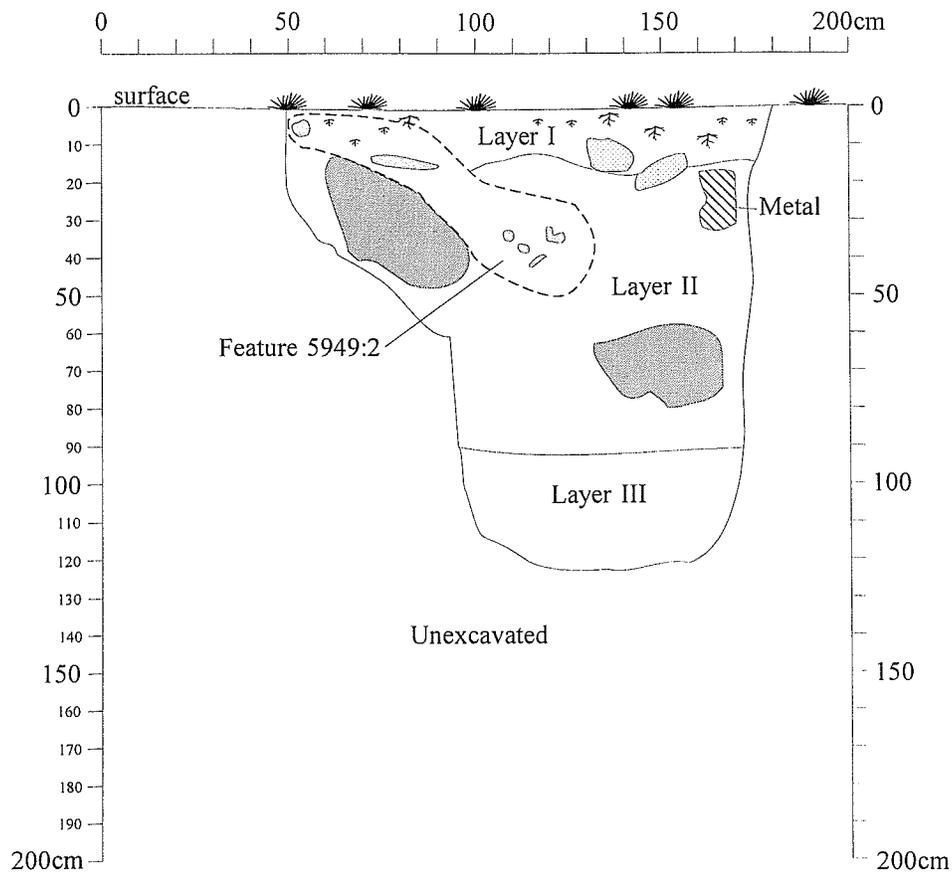
Site 5950

Feature	Type	Size (m)	Description
5950:1	foundation	2 x 7	rectangular foundation constructed of mortared basalt; interior is earthen; the south and west edges are obscured by soil and vegetation
5950:2	well	3 x 3	mortared basalt walls with concrete rim; rim stands 20cmAGL; interior is rubble/trash filled to 5m below ground surface
5950:3	foundation	3 x 3	multi-angled concrete foundation with metal pole coming up out of one corner; partially obscured by soil and vegetation
5950:4	water pump?	5 x 5	concrete structure with mortared basalt foundation in two tiers; tiers stand approximately 70cmAGL; concrete structure stands 3mAGL; interior is empty
5950:5	well?	3 x 6	rectangular structure with concrete rim and basalt walled subsurface interior; rim stands 10cmAGL; interior is soil and rubble filled to the ground surface with the exception of the easternmost end, which is 1.5m below ground surface before encountering fill (exposing the basalt walled interior)

Table 5: Cultural Materials

Provenience	Object	Weight (g)	Description
Trench 35	washer?	176.2	rubber-like material in disk shape with hole in center (1.5x10x10cm)
Site 5950 Surface Collection	ceramic	40.8	willow ware

Figure 20: South Profile of Feature 5949:2; Trench 35



Layer I: Loose detritus, gravel, stone, coral mixed with very dark grayish brown (10YR 3/2) silty clay loam

Layer II: Very dark gray (10YR 3/1) silty clay loam with loose ashy soil

Layer III: Dark brown (10YR 3/3) silty clay

KEY	
	Grass and Roots
	Coral
	Osteological Remains
	Basalt Stones

trench. Historic materials such as ceramics, tile, metal, etc., (not collected) were also present (refer to Site 5950 descriptions below). Given the presence of midden materials in the soil, Feature 5949:1 is presumed to be a habitation feature, rather than a burial feature.

Stone terraces and enclosures were present on the hillside of Kamaile‘unu Ridge just above and outside of the subject corridor, some of which are post-Contact (containing concrete sluices), though most of which are of indeterminate time usage. Some of these may be traditional features which were modified during the post-Contact era.

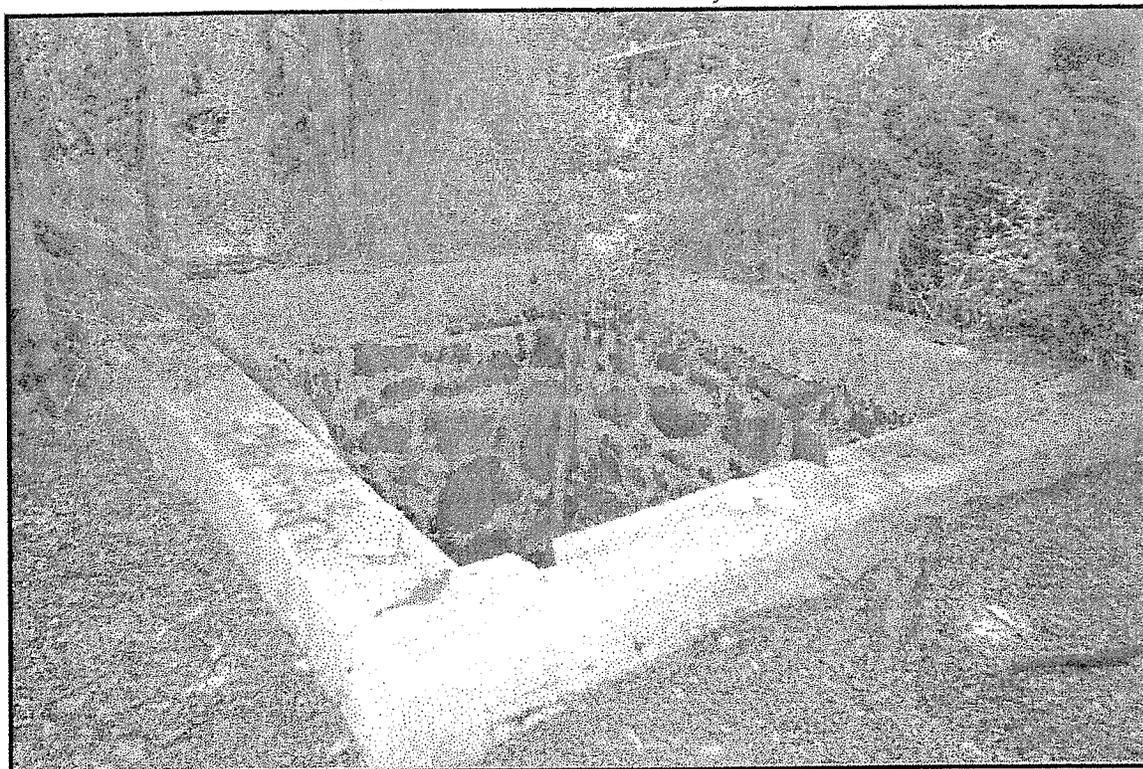
As a part of the Wai‘anae (Kamaile) Complex, in which Site 5949 is included, Kuka‘au‘au Cave (Site 1185) and Kamaile Heiau (Site 161) were visited during the current investigations. Midden was noted on the ground surface of the cave, and a few small pits were observed in back of cave, likely from looters. The *heiau* was in good condition, with coral still present on the surface in places, and internal enclosures remaining visible.

Site 5950

Site 5950, located at the Kaulawaha Road corridor of the current subject property, consists of a portion of a sugar plantation camp associated with the Wai‘anae Plantation as well as features relating to the water pumping station for the plantation (see Figure 6). Several concrete and mortared basalt foundations and a mortared basalt well were identified within the subject corridor. Some of these features are likely ones noted by Hommon (1978)(refer to Appendix A). Table 4 lists these structures and gives brief descriptions. The foundations may be to structures visible in Plate 1. Numerous large monkey pod trees and a mango tree were also present, which may be the same trees shown in Plate 1. The well (Feature 5950:2) is likely one of the wells constructed by the Wai‘anae Plantation discussed above in Section 3.1 (see Plate 4). A large pit was present along the subject corridor, which may have been a failed attempt at tapping artesian waters (see Figure 6). Feature 5950:4 may be the original water pumping station (see Plate 5). Historic materials indicative of historic habitation were present on ground surface and within Trench 35, such as ceramics, bottle glass (including violet glass), metal, etc.. Only two items were collected, including an old (perhaps early form of rubber?) washer, and a piece of willowware ceramic (refer to Table 5).

Other post-Contact structures were present outside the project corridor, but were not recorded. These included additional concrete foundations, stone terraces (including some with concrete sluices), stone enclosures, an L-shaped stone enclosure with collapsed tin roofing, a small cinderblock structure with incorporated railroad rails containing an inscription in concrete of “December 17, 1962.” Viewing from above, it was noted that the line of monkey pod trees continued beyond the subject property to the southeast. These trees likely mark the location of Site 5950 as it continues outside the project boundary. It was noted that Milikia Flume is still present though in somewhat dilapidated condition along the slopes of Kamaile‘unu Ridge.

Plate 4: Feature 5950:2; Well



View Facing Northwest

Plate 5: Feature 5950:4; Possible Water Pump



View Facing East

Section 6: Discussion

The historic background research and findings on the subject property provide an interesting look into the historical background and land use in Kamaile. It is clear that this fertile land was extensively utilized during traditional times as well as during the post-Contact period. During the traditional times (prior to Western influence, from pre-Contact to the mid-eighteen hundreds), this area was utilized for agriculture, aquaculture, habitation, burial and ritual purposes. By the mid-eighteen hundreds, Kamaile was the second largest community on the Wai'anae Coast, with an estimated 175 residents. Numerous Land Commission Awards were granted for lands containing multiple "patches" or *lo'i* fields, horse pastures andouselots. With the genesis of the Wai'anae Plantation in the latter half of the nineteenth century, a marked shift in land use occurred, wherein *lo'i* fields were transformed into sugarcane fields, and the Hawaiian village was overlain by a multi-ethnic plantation camp. Keko'o spring, which once watered the *lo'i* fields below, was tapped through artesian wells and pumped to feed the sugarcane.

The traditional subsurface deposit, Site 5949, contains a rich resource for research potential. This site also has the potential for having an early date of occupation (Cordy 1998:6). Certainly, some disturbance has occurred to this site over the last 150 years, as evidenced by the disturbance to Features 5949:1 and 2. However, stone terraces and enclosures were observed along the slopes of Kamaile'unu Ridge, just outside the subject corridor, and additional subsurface features likely exist below the ridge. Additionally, buried *lo'i* deposits may still exist as well.

The remnants of the Wai'anae Plantation camp and pumping station, Site 5950, provides a glimpse into life and work associated with the first major sugar plantation on O'ahu. Further work at this site would broaden the picture, with the site mapped in its entirety. Excavation could reveal information such as placement of plantation structures in relation to traditional structures and the reuse of traditional features during the plantation era. An examination of the contents within the well(s) may provide a wealth of information regarding daily life of the inhabitants and workers.

Section 7: Evaluations of Site Significance and Recommendations

Evaluations of Site Significance

Two sites of significance to the interests of historic preservation, Site 1181(5949) and Site 5950, were identified during the current investigations. Site 50-80-07-5949 consists of two disturbed subsurface features believed to represent remnants of structures formerly associated with Site Complex 1181. Based upon investigations conducted at these features, it is believed that they were utilized for habitation and burial related functions which may have occurred at any time from relatively early in the pre-Contact period to the mid-eighteen hundreds. Subsurface deposits of the site are presumed to continue along a portion of the Kaulawaha Road corridor as well as beyond the project boundaries. This site qualifies to be considered significant under Criterion D (site has yielded, or is likely to yield, information important in prehistory or history) of the National Register of Historic Places criteria and Criterion E (site has cultural significance) of the Hawai'i Register of Historic Places criteria (refer to Table 6).

Site 50-80-07-5950 consists of five mortared basalt and concrete structures. Based upon investigations conducted at these features, it is believed that they were associated with the Wai'anae Plantation camp and pumping station dating from the late eighteen hundreds to the mid-twentieth century. The site continues beyond the project boundaries. This site qualifies to be considered significant under Criterion A (site associated with events contributing to broad patterns in history) and D of the National Register of Historic Places criteria (refer to Table 6).

Recommendations

Archaeological Consultants of the Pacific, Inc. recommends that a determination be made that future construction activities at Kamaile would have an "adverse effect" on significant historic properties at Sites 1181(5949) and 5950 under the Advisory Council Regulations, 36 CFR 800. Data Recovery is recommended for both of these sites and a Burial Treatment Plan is recommended for Site 1181(5949). Because of the proximity to Kamaile Heiau, Site 1181(161) and Kuka'au'au cave, Site 1181(1185), construction activities at the current subject property in Kamaile will have an indirect impact on these sites, it is therefore considered to have an "adverse effect" on those sites under the Advisory Council Regulations, 36 CFR 800.

Due to the proximity to the O.R. & L. railroad (Site 9714), construction activities at the current subject property in Nanakuli will have an indirect impact on this site, it is therefore considered to have an "adverse effect" on the site under the Advisory Council Regulations, 36 CFR 800. As the O.R. & L. railroad (Site 9714) lies immediately adjacent to the subject property, care should be taken to avoid this site.

Table 6: Summary of Site Significance Evaluations

Site	Description	Function	Significance Evaluations
1181(5949)	Subsurface traditional deposit containing a stone platform/pavement and a burial feature	B and H	D and E
5950	Wai'anae Plantation camp and pumping station structures	Ag and H	A and D

Functional Interpretations

- Ag:** Agriculture
- B:** Burial
- H:** Habitation

Code For Significance Evaluation Criteria

- A:** Site is associated with events that have made a significant contribution to the broad patterns of history.
- B:** Site is associated with the lives of persons significant in the past.
- C:** Site embodies the distinctive characteristics of a type, period, or method of construction; or is the work of a master; or possesses high artistic values; or represents a significant and distinguishable entity.
- D:** Site has yielded or is likely to yield information important in prehistory or history.
- E:** Site has Cultural Significance (*heiau*, shrine, burial, etc.).
- NS:** Not Significant.
- NLS:** No Longer Significant.

Criteria A-D represent National Register of Historic Places criteria.
 Criterion E represents Hawai'i Register of Historic Places criterion.
 NS and NLS represent designations acceptable to the DLNR-SHPD.

Conclusion

An Archaeological Inventory Survey has been conducted along the Wai‘anae Coast on the Island of O‘ahu. Two sites were identified: 1) Site 50-80-07-5949, a traditional subsurface deposit determined to likely represent the disturbed remnants of features associated with the Wai‘anae (Kamaile) Complex 50-80-07-1181; and 2) Site 50-80-07-5950, structural foundations relating to the Wai‘anae Plantation camp and water pumping station at Kamaile.

As a result of the current investigations, the historic properties of Sites 1181(5949) and 5950, located in Kamaile, are considered significant to the interests of historic preservation. Archaeological Consultants of the Pacific, Inc. recommends that a determination be made that construction activities would have “adverse effect” on Sites 1181(5949) and 5950 under the Advisory Council Regulations, 36 CFR 800. Data Recovery investigations and the preparation of a Burial Treatment Plan are recommended for Site 1181(5949). Data Recovery is recommended for Site 5950. Because of the proximity to Kamaile Heiau, Site 1181(161) and Kuka‘au‘au cave, Site 1181(1185), construction activities at the current subject property in Kamaile will have an indirect impact on these sites, it is therefore considered to have an “adverse effect” on those sites under the Advisory Council Regulations, 36 CFR 800. Due to the proximity to the O.R. & L. railroad (Site 9714), construction activities at the current subject property in Nanakuli will have an indirect impact on this site, it is therefore considered to have an “adverse effect” on the site under the Advisory Council Regulations, 36 CFR 800. As the O.R. & L. railroad (Site 9714) lies immediately adjacent to the subject property, care should be taken to avoid this site.

References Cited

Ahlo, H.

- 1980 "Cultural Resource Reconnaissance of the Proposed Waianae Agricultural Park, Waianae, O'ahu." On file at DLNR-SHPD.

Armstrong, R. Warwick

- 1973 *Atlas of Hawaii*. University of Hawaii Press, Honolulu.

Barrera, W.M. Jr.

- 1975 "Archaeological Site Survey at Maili, O'ahu." Chiniago Enterprises, Kane'ohe. On file at DLNR-SHPD.

Beckwith, M.

- 1982 *Hawaiian Mythology*. University of Hawaii Press, Honolulu.

Bordner, R.M.

- 1977 "Archaeological Reconnaissance of the Proposed Nanakuli Landfill Site, Wai'anae, O'ahu." Archaeological Research Center Hawaii, Inc.. On file at DLNR-SHPD.

- 1981 "Archaeological Reconnaissance--Waianae Water Main Replacement." Archaeological Research Center Hawaii, Inc.. On file at DLNR-SHPD.

Borthwick, D., R. Chiogioji, H.H. Hammatt and D.W. Schideler

- 1999 "Surface Archeological Survey for the Proposed Poka'i Bay Beach Park, Poka'i Bay, Wai'anae, O'ahu." On file at DLNR-SHPD.

Chapman, P.

- 1967 "Waianae Kai Pounder Workshop Area." Anthropology Department, Bishop Museum, Honolulu.

Chiniago Incorporated

- 1982 Letter to Mr. Fred Proby, VTN Pacific. On file at DLNR-SHPD.

Chiogioji, R. and H.H. Hammatt

- 1993 "Archaeological Investigations of a 5-Acre Parcel in the *Ahupua'a* of Lualualei, Island of O'ahu (TMK 8-7-21:17)." Cultural Surveys Hawaii, Kailua. On file at DLNR-SHPD.

Cleghorn, Paul L.

- 1997 "The Results of an Archaeological Inventory Survey in Coastal Makaha, Waianae, Oahu, Hawaii (TMK 8-8-2:47)." Pacific Legacy, Inc.. Kailua. On file at DLNR-SHPD.

Cordy, R.

1975 "Archaeological Excavation of CH-OA-1 (Maili, O'ahu)." On file at DLNR-SHPD.

1997 "Learning About Nanakuli's Past: The 1988-1991 Archaeological Survey of Nanakuli." On file at DLNR-SHPD.

1998 "Ka Moku O Wai'anae: He Mo'olelo O Ka Wa Kahiko." On file at DLNR-SHPD.

Cordy, R., W.B. Masse, N. Pak, L.J.M. Lee and C. Johnson

1990 "Status Report 3 DHHL-DLNR Nanakuli, Archaeological Inventory Survey (TMK 8-4-04:08)/(TMK 8-9-07:08)." On file at DLNR-SHPD.

Cordy, R. and N. Pak

1990 "Status Report 4 DHHL-DLNR Nanakuli, Archaeological Inventory Survey (TMK 8-4-04:08)/(TMK 8-9-07:08)." On file at DLNR-SHPD.

Dega, M.

1998 "Letter Report Regarding An Archival and Field Reconnaissance of Ulehawa Beach Park, Final Environmental Assessment." PBR Hawaii, Honolulu. On file at DLNR-SHPD.

Denham, T., J. Kennedy and L. Reitsema

1992 "Archaeological Inventory Survey with Subsurface Testing Report for a Property Located at TMK: 8-5-02:48, Waianae Ahupua'a, Waianae District, Island of O'ahu." On file at DLNR-SHPD.

Elmore, M., J.R. Moore and J. Kennedy

2000 "An Archaeological Inventory Survey Report for TMK: 8-4-02: 50 Located in Makaha Ahupua'a, Wai'anae District, Island of O'ahu." ACP, Hale'iwa. On File at DLNR-SHPD.

Environmental Impact Study Corporation

1982 "Lower Waianae, Well#1 Walk-Through Archaeological Reconnaissance." On file at DLNR-SHPD.

Foote, D.E., E.L. Hill, S. Nakamura, and F. Stevens

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

- Flood, K., P.C. Klieger, S.A. Lebo, B. Dixon, S.D. Clark and S. 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." On file at DLNR-SHPD.
- Green, Roger C. (ed.)
 1969 *Makaha Valley Historical Project, Interim Report No. 1.* Pacific Anthropological Records No. 4. B.P. Bishop Museum, Honolulu.
 1970 *Makaha Valley Historical Project, Interim Report No. 2.* Pacific Anthropological Records No. 10. B.P. Bishop Museum, Honolulu.
- Green, Roger C.
 1980 *Makaha Before 1880 A.D.: Makaha Valley Historical Project - Summary, Report No. 5.* Pacific Anthropological Records No. 31. B.P. Bishop Museum, Honolulu.
- Hammatt, H.H., D. Borthwick and D. Shideler
 1985 "Archaeological Excavations at the Wai'anae Army Recreation Center." On file at DLNR-SHPD.
 1987 "Archaeological Survey and Excavation of a Prehistoric Agricultural Complex (50-80-07-3200)—Waianae Valley Agricultural Park, Oahu." On file at DLNR-SHPD.
- Hammatt, Hallett H., and Jennifer J. Robbins
 1991 "An Archaeological Inventory Survey for the Proposed Kili Drive/Water Street 20-inch Water Main, Makaha, Waianae, Oahu." Cultural Surveys Hawaii. On file at DLNR-SHPD.
- Hammatt, H.H., J.J. Robbins and M. Stride
 1993 "An Archaeological Inventory Survey of a 170-Acre Parcel in the *Ahupua'a* of Lualualei, Wai'anae District, Island of O'ahu (TMK 8-7-9: portion 2; 8-7-10:6 and 10; 8-7-19: portion 1)." Cultural Surveys Hawaii, Kailua. On file at DLNR-SHPD.
- Hammatt, H.H. and D. Shideler
 1991 "Archaeological Monitoring at Liopolo Street, Maili 8" Water System, Part III, Maili, Wai'anae, O'ahu (With Discussion of Burials S.S. No. 50-80-07-4244)." Cultural Surveys Hawaii, Kailua.
- Handy, E.S.C.
 1940 *The Hawaiian Planter.* Volume 1, Bishop Museum Bulletin No. 161, Honolulu.

- Handy, E.S.C. and E.G. Handy
 1972 *Native Planters in Old Hawaii; Their Life, Lore and Environment*. B.P. Bishop Museum Bulletin No. 233, Honolulu.
- Haun, A.E.
 1991 "An Archaeological Survey of the Naval Magazine and Naval Communication Area Transmission Facility, Lualualei, O'ahu, Hawai'i." On file at B.P. Bishop Museum.
- Hommon, R.
 1978 "Waianae (Kamaile) Complex, Oahu: 50-80-07-1181 and Ho'ohana Project." On file at DLNR-SHPD.
- I'i, John Papa
 1959 *Fragments of Hawaiian History as recorded by John Papa I'i* (Translated by M.K. Pukui; Edited by D.B. Barrere). Bishop Museum Press, Honolulu.
- Jimenez, J.A.
 1994 "Additional Archaeological Inventory Survey Maili Kai Project Area." PHRI, Hilo. On file at DLNR-SHPD.
- Kennedy, J.
 1983 "A Walk-Through Surface Survey of the Proposed Wai'anae Corporation Yard (TMK 8-7-06:32) at Lualualei, Island of O'ahu." ACH, Hale'iwa. On file at DLNR-SHPD.
- Kolb, M.J., P.J. Conte, M. McFadden, C.A. Mitchell and R. Cordy
 1995 "Archaeological Survey and Excavations at Pahe'ehe'e Ridge, Waianae Ahupua'a, Waianae District, Island of Oahu." On file at DLNR-SHPD.
- Kuykendall, R.
 1967 *The Hawaiian Kingdom*. Vol. I, Honolulu: The University Press of Hawaii.
- Ladd, Edmund J. (ed.)
 1973 *Makaha Valley Historical Project, Interim Report No. 4*. Pacific Anthropological Records No. 19. B.P. Bishop Museum, Honolulu.
- Ladd, Edmund J., and Douglas E. Yen (eds.)
 1972 *Makaha Valley Historical Project, Interim Report No. 3*. Pacific Anthropological Records No. 18. B.P. Bishop Museum, Honolulu.
- Masse, B.
 1989 "A Preliminary Reconnaissance of the Proposed Route for the Waianae Valley Gravity Sewer." On file at DLNR-SHPD.

Mayberry, J.D. and P.H. Rosendahl

- 1988 "Archaeological Reconnaissance Survey for Environmental Impact Statement (EIS), Maili Kai Property, Land of Lualualei, Wai'anae District, Island of O'ahu (TMK 8-7-10:2, 14)." PHRI, Hilo. On file at DLNR-SHPD.

McAllister, J.G.

- 1933 *Archaeology of Oahu*. Bishop Museum Bulletin 104. B.P. Bishop Museum, Honolulu.

McDermott, M., and H.H. Hammatt

- 1999 "Archaeological Inventory Survey of the Proposed Nanakuli 242 Reservoir Site, With Archaeological Assessment of the Proposed 20" Transmission Main Along Nanakuli Avenue, Nanakuli, Waianae District, Island of Oahu (TMK 8-9-8:3)." Cultural Surveys Hawaii. On file at DLNR-SHPD.

- 2000 "Archaeological Inventory Survey of the 57.65 Acre Ulehawa Beach Park Parcel, Ahupua'a of Lualualei, Wai'anae District, Island of O'ahu (TMK: 8-7-05:01, 03 and 05; 8-7-06:03; 8-7-07:01; 8-7-08:26)." Cultural Surveys Hawaii. On file at DLNR-SHPD.

McDermott, M., S.T. Kikiloi, V. Creed, D.W. Schideler and H.H. Hammatt

- 2000 "Archeological Inventory Survey of a 5-Acre Portion of Hale'iwa Ali'i Beach Park, Pa'ala'a Ahupua'a, Waialua District, O'ahu Island (TMK 6-6-02: por. 01)." Cultural Surveys Hawaii, Kailua. On file at DLNR-SHPD.

McGrath, E, K.M. Brewer and B. Krauss

- 1973 *Historic Waianae, a Place of Kings*. Island Heritage, Limited, Norfolk Island, Australia.

Moore, J.R., and J. Kennedy

- 1994 "Archaeological Investigations for the Board of Water Supply's Proposed Makaha 242 Reservoir Site Located at TMK: 8-4-02: 11 (Lot 1236) in Makaha Ahupua'a, Waianae District, on the Island of Oahu." ACP, Hale'iwa. On file at DLNR-SHPD.
- 2000 "An Archaeological Inventory Survey Report for a Portion of TMK: 8-4-02: 58 Located in Makaha Ahupua'a, Wai'anae District, Island of Oahu." ACP, Hale'iwa. On File at DLNR-SHPD.

Nakamura, B., and J. Pantaleo

- 1994 "Aspects of the History of Lualualei and Nanakuli, Wai'anae, O'ahu." Aki Sinoto Consulting. On file at DLNR-SHPD.

- Neller, E.
 1982 "An Archaeological Reconnaissance Survey in a Portion of Waianae Kai, O'ahu." On file at DLNR-SHPD.
- Ogden Environmental and Energy Services Co.
 1997 "Final Report Cultural Resources Overview Survey Naval Magazine Lualualei, Island of O'ahu, Hawai'i, in Conjunction with Department of Defense Legacy Resources Management Program: Demonstration Project #70." On file at DLNR-SHPD.
- Ota, J.
 1981 "Archaeological Field Report: Waianae Water Well Site for the Honolulu Board of Water Supply, Waianae, Oahu." On file at DLNR-SHPD.
- Pukui, Mary K., Samuel H. Elbert and Esther T. Mookini
 1974 *Place Names of Hawaii*. University of Hawaii Press, Honolulu.
- Riford, M.
 1984 "Report of Archaeological Consulting Services During Repair of Sewer Lines at Waianae Army Recreation Center, O'ahu." On file at Anthropology Department, Bishop Museum, Honolulu.
- Robbins, J. and L. Anderson
 1998 "Final Archaeological Report Phase I Reconnaissance Survey at Naval Radio Transmitter Facility Lualualei (RTF Lualualei), O'ahu, Hawai'i." Ogden Environmental and Energy Services Co. On file at DLNR-SHPD.
- Rosendahl, P.
 1981 "Archaeological Reconnaissance Survey of the Waianae Valley Road Improvements Alignment, Waianae, O'ahu." On file at DLNR-SHPD.
- Rosendahl, P. and M. Rosendahl
 1973 "Waianae Kai Silting Pond Complex." On file at Anthropology Department, Bishop Museum, Honolulu..
- Rosendahl, P. and W. Shapiro
 1988 "Interim Report: Summary of Findings and General Significance Assessments and Recommended General Treatments." On file at DLNR-SHPD.
- Schilz, A.J., G. Hurst, K. Shun, J. Clevenger, M. Pietrusewsky, M. Weisler and A. Ziegler
 1994 "Subsurface Archeological 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.. On file at DLNR-SHPD.

Schilz, A.J., D. Reveley and J. Landrum

- 1995 "Archaeological Subsurface Testing in Conjunction with Milcon P-313, Range Operations Center Naval Undersea Warfare Engineering Station Detachment, Lualualei at Nanakuli, O'ahu Island, Hawai'i (Pre-Final Report)." Ogden Environmental and Energy Services Co.. On file at DLNR-SHPD.

Sinoto, A.

- 1975a "Archaeological Reconnaissance Survey of the Waianae Light-draft Harbor Project Site, Waianae, Oahu." On file at Anthropology Department, Bishop Museum, Honolulu.
- 1975b "Field Inspection of Site 50-Oa-C3-22: An Enclosure in Waianae Valley, O'ahu." On file at Anthropology Department, Bishop Museum, Honolulu.
- 1978 "Reassessment of 10 Acres in Waianae Valley, Island of O'ahu." On file at Anthropology Department, Bishop Museum, Honolulu.
- 1979 "Archaeological Reconnaissance Survey of Proposed Water Well, Waianae, Oahu, Hawaii." On file at Anthropology Department, Bishop Museum, Honolulu.

Social Research Systems Co-op

- 1988 "Waianae Wells I and II: Initial Cultural Resources Reconnaissance, Waianae, Oahu." On file at DLNR-SHPD.
- 1989 "Preliminary Archaeological Monitoring Reconnaissance of Waianae Wells In and II, Construction Phase I." On file at DLNR-SHPD.

Sterling, E., and C.C. Summers

- 1978 *Sites of Oahu*. B.P. Bishop Museum, Department of Anthropology, Honolulu.

Tao, G.

- 1979 "Archaeological Research for the Ku'iliioa Heiau Restoration Project, Poka'i, Wai'anae, O'ahu." On file at Anthropology Department, Bishop Museum, Honolulu.

Thrum, T.G.

- 1907 "Heiau and Heiau Sites Throughout the Hawaiian Islands." *Hawaiian Annual and Almanac for 1907*. Honolulu.

Yent, M. and A. Griffin

- 1979 "Archaeological Reconnaissance Survey of Water Well and Access Road Project in Waianae Valley." On file at DLNR-SHPD.

**Appendix A: National Register of Historic Places Inventory
Nomination Form for the Wai‘anae (Kamaile) Complex**

NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Type all entries - complete applicable sections)

Hawaii	
COUNTY:	
Honolulu	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

1. NAME

COMMON:
WAIANAE COMPLEX

AND/OR HISTORIC:

2. LOCATION

STREET AND NUMBER:
At the end of Maiuu Road

CITY OR TOWN:
Waianae

STATE: Hawaii CODE: 15 COUNTY: Honolulu CODE: 03

3. CLASSIFICATION

CATEGORY (Check One)	OWNERSHIP	STATUS	ACCESSIBLE TO THE PUBLIC
<input checked="" type="checkbox"/> District <input type="checkbox"/> Site <input type="checkbox"/> Object	<input type="checkbox"/> Public <input type="checkbox"/> Private <input checked="" type="checkbox"/> Both	<input type="checkbox"/> Occupied <input checked="" type="checkbox"/> Unoccupied <input type="checkbox"/> Preservation work in progress	Yes: <input checked="" type="checkbox"/> Restricted <input type="checkbox"/> Unrestricted <input type="checkbox"/> No

PRESENT USE (Check One or More as Appropriate)

<input type="checkbox"/> Agricultural	<input type="checkbox"/> Government	<input type="checkbox"/> Park	<input type="checkbox"/> Transportation	<input type="checkbox"/> Comments
<input type="checkbox"/> Commercial	<input type="checkbox"/> Industrial	<input type="checkbox"/> Private Residence	<input type="checkbox"/> Other (Specify)	
<input type="checkbox"/> Educational	<input type="checkbox"/> Military	<input type="checkbox"/> Religious	<u>Unused</u>	
<input type="checkbox"/> Entertainment	<input type="checkbox"/> Museum	<input type="checkbox"/> Scientific		

4. OWNER OF PROPERTY

OWNER'S NAME:
State of Hawaii (Honolulu) Makaha Valley Inc. (Honolulu)

STREET AND NUMBER:

CITY OR TOWN: STATE: Hawaii CODE: 15

5. LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC.:
Bureau of Conveyances, Department of Land and Natural Resources

STREET AND NUMBER:
465 South King street

CITY OR TOWN: STATE: Hawaii CODE: 15

6. REPRESENTATION IN EXISTING SURVEYS

TITLE OF SURVEY:
Archaeology of Oahu

DATE OF SURVEY: 1930 Federal State County Local

DEPOSITORY FOR SURVEY RECORDS:
Bishop Museum

STREET AND NUMBER:
1355 Kalihi Street

CITY OR TOWN: STATE: Hawaii CODE: 15

STATE: Hawaii
 COUNTY: Hon.
 ENTRY NUMBER
 DATE

SEE INSTRUCTIONS

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7. DESCRIPTION

CONDITION	(Check One)					
	<input type="checkbox"/> Excellent	<input checked="" type="checkbox"/> Good	<input type="checkbox"/> Fair	<input type="checkbox"/> Deteriorated	<input type="checkbox"/> Ruins	<input type="checkbox"/> Unexposed
	(Check One)			(Check One)		
	<input type="checkbox"/> Altered	<input checked="" type="checkbox"/> Unaltered	<input type="checkbox"/> Moved	<input checked="" type="checkbox"/> Original Site		

DESCRIBE THE PRESENT AND ORIGINAL (If known) PHYSICAL APPEARANCE

The Waianae complex lies near the seaward end of the ridge separating Makaha and Waianae valleys. It consists of Kamaile heiau, a habitation cave, and a habitation complex.

Kamaile Heiau (Site No. 161)

Kamaile heiau is located at about the 200 foot elevation on the south side of a knoll along the ridgeline of Puu Kamalleunu. Prickly pear cactus, haole koa, and kiawe are the only plants in the area other than low grasses for the area is quite dry. The heiau was considered by Thrum, an early expert on such structures in Hawaii, as being of the Pookanaka, or sacrificial, class. The heiau today is a single terrace, standing flush against a rather steep hillside, and commanding a fine view of the Waianae Coast and the sea. Its southern edge shows that the heiau was built vertically from a moderately steep slope. More detailed dimensions and information on some internal features may be obtained by referring to the drawing and description made by McAllister in 1930, which are accurate.

Kukaauai Cave Shelter (Site No. 1185)

Kukaauai cave is about 12 meters deep, some 8 meters wide, and about 3 meters in average height. It lies almost directly below the heiau but slightly to the west, near the remnants of an old water flume. A famous spring was once located below the cave and watered extensive taro fields. Today, the entrance is partially blocked by kiawe and haole koa, and also by what appears to be the remains of a stone wall. A heap of tailings from artifact collector digging lies near the entrance. Inside the cave, it is evident that such pothunter digging has so far been restricted to the area immediately inside the entrance; the vast majority of the site area lies undisturbed. Extensive midden deposits are evident in the cave, particularly where exposed by the artifact collector's profiles. An unusual amount of organic material is present, such as coconut husks, kukui nuts, gourd fragments, and bamboo. The midden also contains shellfish, fish, coral, and some charcoal. No pre-historic artifacts were noted, but a middle 19th century bottle fragment and a cut nail were found. However, it is certain that this cave was inhabited in prehistoric times.

Habitation Area (Site No. 1190)

Also lying below Kamaile heiau, and just to the south of Kukaauai cave, were found the previously unrecorded remains of what appears to have been a small habitation area. This complex consists of a series of structures constructed of stacked stone. One such structure is a faced, semi-circular platform. It is about 2 x 3 meters and 1½ meters high and in good condition, although no function could be determined. A small bubble cave was located about six meters inland from this structure and had a soil deposit in it; no midden or artifacts were noted. Six additional platforms are scattered nearby, most likely housesites. One was very

SEE INSTRUCTIONS

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

STATE Hawaii	
COUNTY Honolulu	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

(Continuation Sheet)

(Number all entries)

Waianae Complex - continued

complicated, with a series of terraces or steps associated, and might have been a small unrecorded shrine or heiau. This complex can best be appreciated by looking at the attached sketch map which shows their relationships to one another and to the cave and Kamaile heiau.

8. SIGNIFICANCE

PERIOD (Check One or More as Appropriate)

<input type="checkbox"/> Pre-Columbian	<input type="checkbox"/> 16th Century	<input checked="" type="checkbox"/> 18th Century	<input type="checkbox"/> 20th Century
<input type="checkbox"/> 15th Century	<input type="checkbox"/> 17th Century	<input checked="" type="checkbox"/> 19th Century	Pre-1778

SPECIFIC DATES: (If Applicable and Known)

AREAS OF SIGNIFICANCE (Check One or More as Appropriate)

<input type="checkbox"/> Aboriginal	<input type="checkbox"/> Education	<input type="checkbox"/> Political	<input type="checkbox"/> Urban Planning
<input checked="" type="checkbox"/> Prehistoric	<input type="checkbox"/> Engineering	<input checked="" type="checkbox"/> Religion/Philosophy	<input type="checkbox"/> Other (Specify)
<input type="checkbox"/> Historic	<input type="checkbox"/> Industry	<input type="checkbox"/> Science	_____
<input type="checkbox"/> Agriculture	<input type="checkbox"/> Invention	<input type="checkbox"/> Sculpture	_____
<input type="checkbox"/> Architecture	<input type="checkbox"/> Landscape Architecture	<input checked="" type="checkbox"/> Social/Humanitarian	_____
<input type="checkbox"/> Art	<input type="checkbox"/> Literature	<input type="checkbox"/> Theater	_____
<input type="checkbox"/> Commerce	<input type="checkbox"/> Military	<input type="checkbox"/> Transportation	_____
<input type="checkbox"/> Communications	<input type="checkbox"/> Music		
<input type="checkbox"/> Conservation			

STATEMENT OF SIGNIFICANCE

This entire complex, consisting of Kamaile heiau, Kukaauau cave, and the habitation complex, has a very high research and interpretive potential. Kamaile heiau is a very good example of a heiau, second only to Kaneaki heiau in Makaha for the Wainae District of Oahu. Kukaauau cave has extensive midden deposits, fairly bursting with organic materials preserved because of the dryness of the shelter. Any carefully conducted excavation in this cave would yield immense quantities of data on the normally more perishable aspects of Hawaiian material culture. Further, it is obvious that habitation in the cave extended from some unknown time back in prehistory, to well within the historic period. Relatively few sites on Oahu have as high a research potential as does Kukaauau, and it should be accorded the highest protection possible. Finally, the habitation complex is one of the only remaining clusters of habitation structures on Oahu. Although excavation would be less productive in terms of artifact and midden yield than Kukaauau cave, it would be expected that significant data would be discovered. Apparently, this small complex was a somewhat self-contained cluster of structures, perhaps representing a single socially united group, thus affording the possibility of very productive research into Hawaiian non-material culture.

Sufficient historical data exist that point to an old "Waianae Village" at, or very near this area to make one suspect that this habitation complex might well be a portion of its inland extent.

In summary, the combination of a major heiau, a rich cave, and a grouping of habitation structures, makes this entire complex extremely valuable from a research point of view. It would be expected that fairly definitive studies could be made using data from these features, for they all obviously must have been both geographically and socially linked in the past. Any excavation work must, however, be extremely well planned and conducted, for the sites, and especially Kukaauau cave, are very fragile and limited in terms of deposits. No excavation should be allowed that cannot adequately handle the mass of data that will be available, for once the cave is known to exist, it will be subject to heavy pressures by artifact looters. Thus, the excavation must be planned so that almost all data are extracted before being left.

The close proximity of features within the complex with one another,

SEE INSTRUCTIONS

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

(Continuation Sheet)

STATE Hawaii	
COUNTY Honolulu	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

(Number all entries)

Waianae Complex - significance (cont'd)

plus the variety of features present, would make an ideal site to interpret to the public. Once the research has been completed and the structures that might have been dismantled have been restored to their original condition, then a unifying interpretive picture could be developed that would explain the story of the complex.

This site should be given the highest protection available.

9. MAJOR BIBLIOGRAPHICAL REFERENCES

McAllister, J. Gilbert
 1933 Archaeology of Oahu,
 Bishop Museum Bulletin No. 104

10. GEOGRAPHICAL DATA

LATITUDE AND LONGITUDE COORDINATES DEFINING A RECTANGLE LOCATING THE PROPERTY			O R	LATITUDE AND LONGITUDE COORDINATES DEFINING THE CENTER POINT OF A PROPERTY OF LESS THAN TEN ACRES		
CORNER	LATITUDE	LONGITUDE		LATITUDE	LONGITUDE	
	Degrees Minutes Seconds	Degrees Minutes Seconds		Degrees Minutes Seconds	Degrees Minutes Seconds	
NW	21 ° 27 ' 51 "	158 ° 12 ' 03 "				
NE	21 ° 27 ' 50 "	158 ° 11 ' 54 "				
SE	21 ° 27 ' 50 "	158 ° 11 ' 56 "				
SW	21 ° 27 ' 50 "	158 ° 12 ' 06 "				

APPROXIMATE ACREAGE OF NOMINATED PROPERTY: 15 acres

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE:	CODE	COUNTY	CODE

11. FORM PREPARED BY

NAME AND TITLE: T. Stell Newman

ORGANIZATION: State Parks Division DATE: July 1, 1972

STREET AND NUMBER: P.O. Box 621

CITY OR TOWN: Honolulu STATE: Hawaii CODE: 15

12. STATE LIAISON OFFICER CERTIFICATION NATIONAL REGISTER VERIFICATION

As the designated State Liaison Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service. The recommended level of significance of this nomination is:

National State Local

Name _____

Title _____

Date _____

I hereby certify that this property is included in the National Register.

Chief, Office of Archeology and Historic Preservation

Date _____

ATTEST: _____

Keeper of The National Register

Date _____

SEE INSTRUCTIONS

NATIONAL REGISTER OF HISTORIC PLACES
PROPERTY MAP FORM

(Type all entries - attach to or enclose with map)

SEE INSTRUCTIONS

STATE Hawaii	
COUNTY Honolulu	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

1. NAME			
COMMON: WAIANAE COMPLEX		AND/OR HISTORIC:	
2. LOCATION			
STREET AND NUMBER: At the end of Maiuu Road			
CITY OR TOWN: Waianae			
STATE: Hawaii	CODE 15	COUNTY: Honolulu	CODE 03
3. MAP REFERENCE			
SOURCE: United States Geological Survey			
SCALE: 1:24000			
DATE: 1954			
4. REQUIREMENTS			
TO BE INCLUDED ON ALL MAPS			
1. Property boundaries where required.			
2. North arrow.			
3. Latitude and longitude reference.			

NATIONAL REGISTER OF HISTORIC PLACES
PROPERTY PHOTOGRAPH FORM

(Type all entries - attach to or enclose with photograph)

SEE INSTRUCTIONS

STATE Hawaii	
COUNTY Honolulu	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

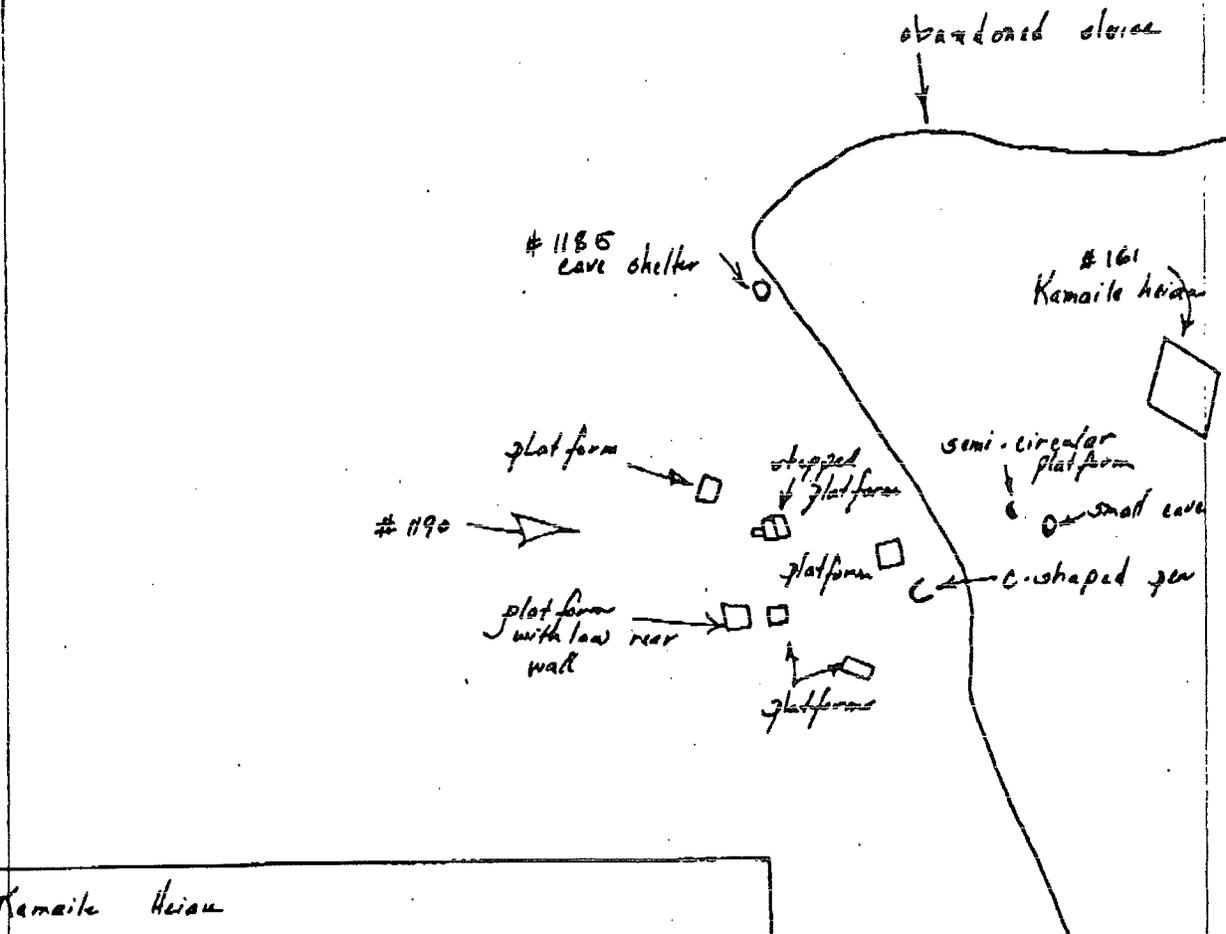
1. NAME			
COMMON: WAIANAE COMPLEX		AND/OR HISTORIC:	
2. LOCATION			
STREET AND NUMBER: At the end of Maiuu Road			
CITY OR TOWN: Waianae			
STATE: Hawaii	CODE 15	COUNTY: Honolulu	CODE 03
3. PHOTO REFERENCE			
PHOTO CREDIT: Hawaii Register of Historic Places			
DATE OF PHOTO: 1971			
NEGATIVE FILED AT: Hawaii Register of Historic Places			
4. IDENTIFICATION			
DESCRIBE VIEW, DIRECTION, ETC. View of one of the platforms within the complex, looking north.			

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY - NOMINATION FORM

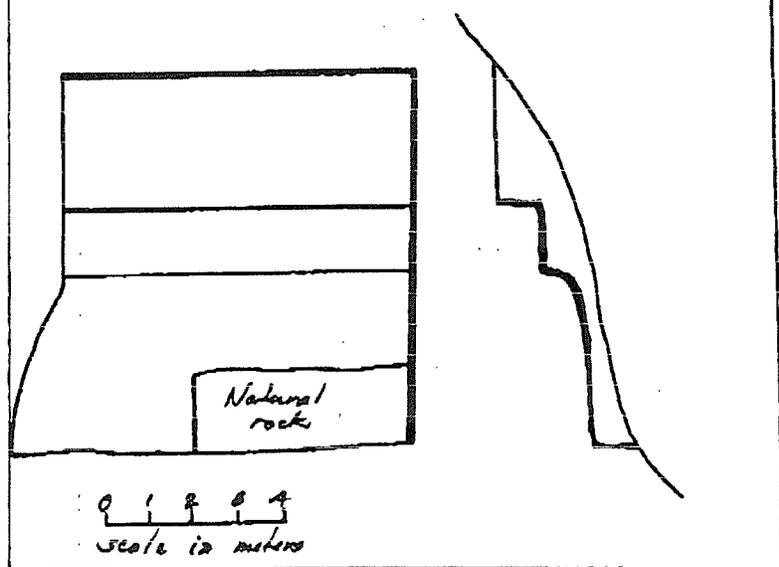
(Continuation Sheet)

STATE	
Hawaii	
COUNTY	
Honolulu	
FOR NPS USE ONLY	
ENTRY NUMBER	DATE

(Number all entries)



Kamaile Heiau



June 16, 1978

Page 1 of 2

MEMORANDUM

TO: FILES: Waianae (Kamaile) Complex, Oahu: 80-07-1181
and Ho'ohana Project

site file.

FROM: R. J. Hommon

Yesterday, 15 June 78, I visited Waianae Complex with Glenn Kila, Leilani Fernandez and others of Ho'ohana project. We saw Kuka'au'au cave, Kamaile heiau and some retaining walls.

The deposit on the floor of Kuka'au'au Cave is still largely intact, though there seem to be a few shallow holes that have been dug by vandals since the last time I saw it some 6 or 7 years ago. The remains of recently-exploded firecrackers litter the floor. The cave is dry and we saw fragments of coconut shell, sugar cane, tapa, and possibly ancient cordage. Human bones were found in several places. Glenn said that he had reburied some of the bones. Surface indications, size and proximity to the Kamaile (ancient) taro lo'i and the coast indicate that this is a very important site in the context of ahupua'a district island and State. Any excavations should be relatively small-scale and very thorough.

Kamaile heiau is reasonably intact, though portions have been disturbed. Glenn says that he has seen a skull and a leg bone in separate places below the surface paving. This may be the result of scattering of the skeleton(s) by vandals. The view from Kamaile heiau is terrific; clearly much better both mauka and makai than that from Kuilioloa heiau.

On the basis of the crude sketch map of the complex that was prepared by Stell (of Jean), the Board of Water Supply pumping station is within the boundaries of this State Register site, and its construction may have destroyed some of the features of the complex. At any rate, C & C did not check the Register files before building the station.

A few hundred meters mauka of the pumping station a section of several areas has been severely disturbed by moss-rock collectors, so that any sites that may have been there are totally obliterated. I was told that this moss-rock area is leased from the State.

Maka'i of the pumping station are a series of retaining walls, some of which are directly associated with an old ditch or flume (not the upper flume shown in Stell's map). Some of these walls might be pre-contact, since they are of old style, but high grass prevented detailed investigation. Portions of these walls were evidently destroyed by the pumping station construction.

Glenn and others told me that the pumping station construction was still proceeding, but I saw no evidence of this. Farley sent a letter to Board of W.S. asking for information, but so far no reply.

Makai and somewhat downhill from the pumping station are at least three stone and mortar lined rectangular pit walls built by the plantation now partly filled with rubbish, including small appliances and car parts. Nearby, a spring rises from the ground, flows perhaps 75 meters, then sinks into the ground again. The water appears clear and the output is strong, and, according to Glenn, permanent. The lushness of vegetation testifies to the water-wealth of this land. It is not surprizing that this Kamaili was so productive in taro. (See R.C. Green's ms. report on Makaha/Waianae). The flow of this spring undoubtedly much stronger in days past (specifically the time of the Mahele). Traces of the old taro lo'i may yet remain here, though disturbance seems extensive.

The people involved in the Ho'ohana project are anxious that the archaeological resources in the area be preserved. In fact Lailani Fernandez urged that Kuka'au'au cave not only be preserved but also "researched", by which she meant excavated. (It has been made clear repeatedly that the present project will not include excavation.) There seems to be no opposition to excavation of sites among the people in the project.

I paid a brief visit to Kuiloloa heiau to see the work of the Waianae Civic Club. A portion of the asphalt pathway has been washed away by wave action. At least one alignment of stones has been fixed in place with cement mortar.

A note on the idea of Kuiloloa being the central and most important heiau in the region: I suggested to Glenn that to discover the accuracy of such stories, the Kupuna should be consulted. He said he had already checked this particular story. The kupuna, he said, laughed when they heard it.

Appendix B: Addendum



ADDENDUM

Introduction

Following the completion of the Inventory Survey of the proposed corridors for the emergency alternate access route in Wai'anae, an additional corridor (Helelua Place Extension) at TMK 8-7-08: 76 (por.) and 77 (por.) was proposed (see Figures 21 and 22). Joseph Kennedy, M.A. and Michelle Elmore, B.A. of Archaeological Consultants of the Pacific, Inc., surveyed this corridor on October 15, 2001. No sites of significance to the interests of historic preservation were identified on the subject property. It is recommended that no further archaeological investigations are necessary.

Environmental Setting

The Helelua Place Extension corridor is located in Lualualei Ahupua'a. This corridor extends from Helelua Place to Lualualei Naval Road (approximately 400 meters). The project area is bounded by undeveloped land. According to Foote et al. (1972), geological formations in this area consist of coral outcropping. Foote et al. (1972:29) describe coral outcropping as consisting of:

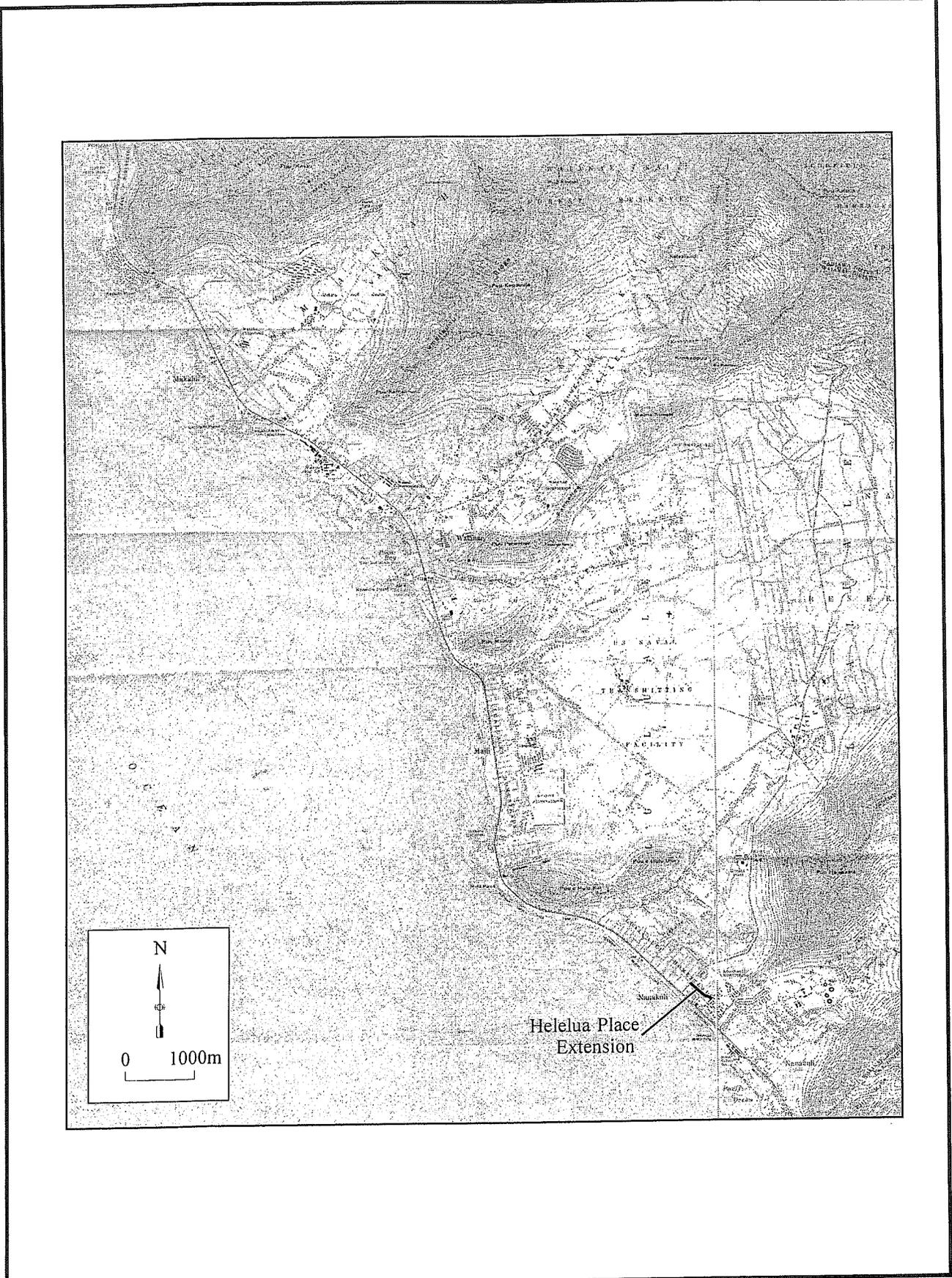
...coral or cemented calcareous sand on the island of Oahu. The coral reefs formed in shallow ocean water during the time the ocean stand was at a higher level. Small areas of coral outcrop are exposed on the ocean shore, on the coastal plains and at the foot of the uplands. Elevations range from the sea level to approximately 100 feet...

Coral outcrop makes up about 80 to 90 percent of the acreage. The remaining 10 to 20 percent consists of a thin layer of friable, red soil material in cracks, crevices, and depressions within the coral outcrop. This soil material is similar to that of the Malama series.

During the current investigation, exposed coral outcropping was indeed observed on the ground surface. In concurrence with Foote et al. (1972), very little naturally deposited soil was present. Aside from these natural geological formations, an extensive amount of fill soils were present in the northwest portion of the property.

Vegetation along the corridor consisted of sparse knee to waist high grasses and various weeds, and stands of scattered *haole koa* (*Leucaena glauca*) and *kiawe* (*Prosopis pallida*). Visibility was excellent due to the sparsity of vegetation. The topography generally consisted of level or near to level ground surface on the karstic coastal plain.

Figure 21: Location of the Helelua Place Extension on a U.S.G.S. Topographic Map



Waianae Coast Emergency Access Road

source: U.S.G.S. 7.5 Minute Series (Topographic)
Waianae & Schofield Barracks Quadrangles 1983

Expected Finds

The expected archaeological findings for a karstic environment could include traditional features such as modified/utilized sinkholes, platforms, pavements, enclosures, C-shaped structures and walls. Post-Mahele features could include cattle ranching walls. Traditional cultural materials could include lithic tools and debitage, shell and bone midden, shell and bone tools and ornaments. Cattle ranching activities may have disturbed traditional features. Modern disturbances may have occurred as a result of grubbing, grading and traversing of heavy equipment.

Of the expected finds, sinkholes are the most likely to be found. Sinkholes are naturally occurring features formed during the downward percolation of rainwater or surface runoff through limestone, or coral rock. Water derived from the atmosphere is slightly acidic. This weak acid is able to dissolve the carbonates which constitute limestone and coral rock. In areas where surface runoff occurs, due to the intensity of rainfall exceeding the infiltration capacity of the exposed reef, the water will flow for short distances overland, until it flows underground along lines of weakness, or joints, in the rock. Through time the water erodes the rock to form depressions or sinkholes. Usually these depressions collect sediment which is deposited as the water flows in to the permeable rock.

The naturally occurring sinkholes may be modified by human agency. These modifications occurred in order to make the sinkhole more attractive for a particular use. A common form of sinkhole modification is a line of stones around the top of the depression. Unmodified sinkholes do not have any stone additions to them, nor have they been internally altered. However, these sinkholes may contain cultural materials. Additionally, sinkholes which are presently unmodified may have been previously modified and subsequently disturbed, removing all traces of modification.

The most likely function of sinkholes is that they were temporary shelters or agricultural plots. The small, enclosed nature of some depressions provides shelter from the elements, with or without modification. Shallow sinkholes that contain accumulations of soil, but are too shallow to afford much shelter, were probably cultivated. The soil and moisture which collect in sinkholes make them ideal agricultural sites in an environment otherwise relatively devoid of soil and moisture. Sinkholes have also been used for interment of human remains. All sinkholes may be significant sites on the basis of the sediments and other materials they contain, even if they were not utilized for shelter, cultivation or burial. The sediments and deposits they contain may yield information on the pre-Polynesian, pre-Contact and post-Contact periods. Past environments may be recreated from pollen remains in sinkholes. A common deposit in sinkholes are the remains of extinct birds. Information regarding the extirpation of native birds may be obtained from such deposits, perhaps in association with culturally instigated changes in ecological niches.

Findings

No archaeological sites were identified on the Helelua Place Extension corridor. The subject property has suffered a great deal of modern disturbance. It was observed that much of the property contained a one to two meter deposit of rocky fill soils. The areas which did not contain fill consisted of exposed coral outcropping and showed evidence of having been traversed extensively by heavy machinery. A large amount of modern debris was strewn on the ground surface, as the area has been used repeatedly for dumping trash, furniture, etc.. It is possible that archaeological sites were once present on the property, but have been subsequently destroyed.

Three sinkhole openings were observed outside the boundaries of the subject property in areas which did not contain fill (see Figure 22). None of the sinkholes contained modifications around their openings. As these features lie outside the limits of subject property, they were not explored nor subjected to testing. A brief description of each of these features is provided below.

TF1, Sinkhole was located *makai* of the subject property, just outside the limits of the fill deposit. The opening measured 1 meter (m) in width, and appeared to drop at an angle into a cavern of unknown size. The base of the hole could not be seen. An old rusted metal pipe was observed leading into the hole, which possibly transported sewage at some previous time.

TF2, Sinkhole was located to the southeast of the fill area, *mauka* of the subject property. The opening measured approximately 70cm and was observed to drop straight down into a cavern of unknown size with a depth of over 2m below ground surface. Modern debris was scattered on the floor of the hole.

TF3, Sinkhole was located to the south of Sinkhole 2, *mauka* of the subject property. The opening measured 100cm and was observed to drop straight down to a depth of approximately 1m. Modern debris was present at the base of the depression.

The possibility remains that additional sinkholes may be present below the fill deposit on the subject property. This could not be determined during the current investigations. In the event that sinkholes are encountered during subsurface construction, it is recommended that they be treated as inadvertent finds. No further archaeological investigations are recommended.

Conclusion

Additional Inventory Survey investigations were conducted by ACP, Inc. for the Wai‘anae emergency access road project. No sites were located along the Helelua Place Extension corridor. Much of the property contained fill soil above a naturally outcropping coral deposit. Three sinkholes were observed outside the boundaries of the subject property. The possibility remains that additional sinkholes may be present below the fill on the subject property, however this could not be determined during the current investigations. In the event that sinkholes are encountered during subsurface construction, it is recommended that they be treated as inadvertent finds. No further archaeological investigations are recommended.

APPENDIX C

Traditional and Cultural Practices Assessment

A Traditional and Cultural Practices Assessment
for Portions of the Proposed Wai`anae Coast
Emergency Access Road at
Nānākuli, Lualualei, Mā`ili, Wai`anae and Mākaha,
Wai`anae District, Island of O`ahu

by

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Cultural Surveys Hawai`i
Revised October, 2001

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ABSTRACT

A Traditional and Cultural Practices Assessment for the proposed Wai`anae Coast Emergency Access Road was conducted by Cultural Surveys Hawai`i for Townscape, Inc. The proposed road runs through portions of four *ahupua`a* or districts: Nānākuli, Lualualei, Wai`anae and Mākaha. The majority of the proposed emergency route uses existing public roadways. Where there are no existing roadways, private property will be utilized to connect with existing paved roads. This report assesses only those portions of the road which will be graded, widened and improved (See Figure 1).

Research of the historical record indicates information regarding traditional Hawaiian lifestyle and land-use during the pre-contact and early post-contact periods was remarkably absent, especially for Nānākuli, Lualualei and Mākaha. Kamaile and Wai`anae were the locus of Hawaiian settlement due to Pōka`i Bay, well-watered streams, and Keko`o Spring. At the time of the *Māhele*, Nānākuli, Lualualei and Wai`anae were designated Crown Lands. As such, large tracts became available for lease as the Hawaiian chiefs struggled to pay their debts to support their newly acquired lifestyle in a fast-changing economy. During the latter half of the 19th century, the history of land use on the Wai`anae Coast was dominated by ranching and then sugar. Major impacts to this coastal community were the construction of the Wai`anae Sugar Mill in 1878, homesteading in the early 1900's and World War II.

The focus of this Cultural Assessment was consultation and identification of cultural concerns that might impact traditional native Hawaiian rights related to subsistence, cultural and religious purposes. As a result of the consultation process, six primary concerns were identified, with the potential of disturbing burials and cultural sites being the highest concern. Of the road-portions being assessed in this report, two segments were flagged as having heightened concerns; the Nānākuli/Farrington Highway segment – from the end of Pōhaku Nui Road to Lualualei Naval Road and *ma kai* of the OR&L railroad track fronting Nānāikapono School, Nānākuli Beach Park and a portion of Ulehawa Beach Park – and the Ala Hema/Ala `Ākau to Kaulawaha segment in Mākaha. Four secondary issues were identified and, though not traditional cultural concerns, they are valid issues which the community has raised and they are discussed as well. Please refer to Sections III and IV of this report which discuss the community concerns and summarize the issues raised. Based on the consultation process, five recommendations are being made to address and mitigate the community's concerns. These recommendations are found in Section IV, the "Recommendations" portion of this report.

Note: Throughout this report the spelling of Hawaiian vocabulary and place names has been standardized to present orthography, except for Hawaiian words used in quotes.

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I. INTRODUCTION

A. Project Background

At the request of Townscape, Inc., Cultural Surveys Hawai'i conducted a Traditional and Cultural Practices Assessment for portions of the proposed Wai`anae Emergency Access Road (WCEAR). The purpose of the WCEAR is to provide an emergency alternate route for the Wai`anae Coast from Mākaha to Nānākuli. In the past, there have been occasions when Farrington Highway was blocked due to storm debris, automobile accidents or other emergency situations, creating a deadlock where the community was unable to get in or out of the area. This especially poses a risk for the Wai`anae Coast community in cases of extreme emergency such as tsunami or fires. The WCEAR serves to address this issue by providing an alternate emergency route, until a permanent alternate route can be worked out to alleviate the traffic concerns on Farrington Highway.

The proposed route runs through the communities of Nānākuli, Lualualei, Mā`ili, Wai`anae and Mākaha (Figure 1). For the most part, the proposed WCEAR route will use already existing public streets and roadways. In areas where public roads do not exist, private property will be used as connector segments to link with existing public roads. The Nānākuli segments include the area *ma kai* of the OR&L railroad adjacent to Farrington Highway; as well as a small portion of Pa`akea Road which is currently a dirt road on private property. The Mā`ili/Lualualei segment is at the end of Mā`ili Kai Community Park and Kaukama Road and goes around Pu`u o Hulu Kai and Pu`u o Hulu Uka. This segment portion is an existing dirt road on private property. The Wai`anae sub-district segment consists of two portions which will connect to Ala Hema and Ala `Ākau. One portion is an existing dirt road, the other portion is an open field area. Both portions are on private property. Within the same sub-district is a proposed segment which will run behind Kamaile Elementary School through an open field area. The Mākaha sub-district has two main segments, Kaulawaha Road and Mahina`au Road. The Kaulawaha Road segment is actually what long-time residents say used to be the "old road" connecting to Mākaha Valley Road. The Board of Water Supply has an easement through a small portion of the segment. Mahina`au Road is an existing paved road.

The initial work for this cultural assessment was conducted during the months of June to August of 2001. The original proposed alignment for Nānākuli ran parallel to and *ma kai* of the O. R. & L. Railroad right-of-way from Nānākuli Avenue to Lualualei Naval Road. As a result of concerns raised during the initial phase of this assessment, the *ma kai* portion of the proposed Nānākuli route was realigned to include the following changes. At the intersection of Farrington Highway and Nānākuli Avenue, the proposed emergency access route would shift to the *ma uka* side of Farrington Highway utilizing the existing streets of Nānākuli Avenue, Manō Avenue and Haleakalā Avenue. The final proposed *ma uka* segment would use the existing Helelua Street to Helelua Place. A new roadway segment would be constructed at the end of Helelua Place to connect to Lualualei Naval Road. This last and new proposed roadway segment (Figure 2) was added to the Scope of Work in September of 2001 and the assessment was carried out during October, 2001.

Per the agreed scope of work, this study does not address the entire proposed WCEAR route. Instead, it addresses only the portions of the route which will be improved with grading, widening and paving – primarily those portions where public roads do not already exist (Figures 2-5). In most of the proposed segments being assessed, dirt roads already exist. It should be noted that the improvements will not include curbs, gutters, sidewalks or landscaping. This report presents the findings of this cultural assessment.



The Purpose Of This Traditional Practices Assessment

The purpose of this Traditional Practices Assessment is to consider the effects the proposed emergency access road may have on native Hawaiians as it pertains to the culture and their right to practice traditional customs. The Hawai'i State Constitution, Article XII, Section 7 protects "all rights" of native Hawaiians that are "customarily and traditionally exercised for subsistence, cultural and religious purposes".

In 1997, the Office of Environmental and Quality Control (OEQC) issued Guidelines for Assessing Cultural Impacts. The guidelines discuss the types of cultural practices and beliefs that might be assessed.

The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man-made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

More recently, H.B. No. 2895 was passed by the 20th Legislature, and approved by Governor Cayetano as Act 50 on April 26, 2000. The bill acknowledges that

. . . the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

This bill states that ". . . environmental assessments or environmental impact statements should identify and address effects on Hawai'i's culture, and traditional and customary rights."

The process and procedures for evaluating cultural impacts is constantly evolving. There continue to be gray areas and unresolved Public Access Shoreline Hawai'i (PASH) issues pertaining to traditional access and gathering rights for native Hawaiians. The intent of OEQC's Guidelines is to help project planners comply with Act 50.

Because the findings of this report addresses issues involving cultural sites and a historic property on the National Register of Historic Places, this report will be reviewed by the State Historic Preservation Division of the Department of Land and Natural Resources.

B. Scope of Work

The following Scope of Work (SOW) was proposed for satisfying requirements related to Hawaiian customary and traditional rights and their applicability to the project area..

- 1) Preparation and mailing of a letter-type project summary, with associated figures, and a request for information regarding traditional cultural practices in the vicinity of the proposed project. The request letter was disseminated to individuals and

groups that may have knowledge of traditional cultural practices in the vicinity of the project area.

- 2) Following a two-week response period, the same parties were contacted by phone, if possible, in order to further the consultation process.
- 3) Based on the response from the mailings and telephone calls, a list of persons and groups that should be contacted in person regarding traditional cultural practices was prepared. These individuals and/or groups were contacted and their information recorded. Brief synopses of all the responses to the consultation process, whether by phone, mail, or in person, were prepared.
- 4) A cultural background summary was written with the focus on placing the information gathered through consultation within the geographic and cultural landscape of Wai`anae. This background summary is based on previous archaeological reports, historical accounts, Land Commission Documents, historic maps, and other secondary sources. This summary is not intended as a comprehensive cultural history.
- 5) Report preparation including synthesis of all background information with the results of the consultation process. This report assesses the proposed project's potential impacts to traditional cultural practices.

C. Methodology

Historical documents and maps were researched at the Hawai`i State Survey Office, Hawai`i State Library, Bernice Pauahi Bishop Museum archives and library, the State Historic Preservation Division (SHPD) library, and the library of Cultural Surveys Hawai`i.

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 surrounding vicinity. A discussion of the consultation process can be found in Section III on "Community Consultations". Please refer to Table I for a complete list of individuals and organizations contacted.

D. Natural Setting

Generally, the Wai`anae District coastal areas are characterized by white sand beaches with low dunes and narrow back dunes (Cordy, 1998). In addition, there are localized areas of old, uplifted coral reefs and limestone flats. Much of the coastal area has been disturbed due to historic and modern development. Most of the narrow back dunes have been graded. Historically, *muliwai*, or backwater marshy areas would often develop behind dunes when streams were blocked; however, these no longer exist.

Vegetation along this arid coast is sparse. With 20 inches or less of rain annually, only the hardiest plants adapted to the coastal environments can thrive in this zone. The vegetation is typical of dry seashore environments in Hawaii and is dominated by alien species. Indigenous species include *hau* (*Hibiscus tiliaceus*), *kou* (*Cordia subcordata*), *kamani* (*Calophyllum inophyllum*), *naupaka* or *naupaka kahakai* (*Scaevola sericea*), *pa`u o Hi`iaka* (*Jacquemontia*

ovalifolia sandwicensis), the native beach morning glory or *pohuehue* (*Ipomea pes-caprae*) and the coconut or *niu* (*Cocos nucifera*). Introduced species found bordering the Farrington Highway include sea grape (*Coccoloba uvifera*), *kiawe* trees (*Prosopis pallida*), Madagascar olive trees (*Noronhia emarginata*), and *koa haole* (*Leucaena leucocephala*).

II. HISTORICAL BACKGROUND

The following provides an overview of the Wai`anae District, with a focus on the four *ahupua`a* through which the proposed WCEAR traverses: Nānākuli, Lualualei (Mā`ili), Wai`anae and Makaha. This is not meant to provide a complete historical background, but merely an overview to familiarize the reader with the history of the areas under discussion.

A. Cultural Setting and Overview of Wai`anae District

Wai`anae is one of six major *moku* (districts) on the island of O`ahu and borders the `Ewa District on the southeast and extends to Ka`ena on the northwest. The district of Wai`anae should not to be confused with Wai`anae *Ahupua`a*, which is a smaller land division within the larger district. Today, the Wai`anae District consists of nine *ahupua`a*: Nānākuli, Lualualei, Wai`anae, Mākaha, Kea`au, `Ōhikilolo, Mākua, Kahanahāiki and Keawa`ula.

In traditional times, the Wai`anae District was particularly known for its multitude of fish and especially for deep sea fishing off Ka`ena where the ocean currents meet. The meaning of Wai`anae (mullet water) also implies an abundance of fish – *`anae*, which is the full-grown mullet (Pukui *et al.*, 1976). Handy and Handy (1972) attribute the naming of Wai`anae to a large fresh water pond for mullet called Pueha [*sic*; Puehu]. An 1840 account by the explorer, Charles Wilkes, attests to the abundance of fish in Wai`anae waters. He comments, “The natives are much occupied in catching and drying fish, which is made a profitable business, by taking them to Oahu, where they command a ready sale” (Wilkes 1845, 4:81-82). This fame holds true today. Wai`anae is still considered one of the most abundant and best fishing grounds on O`ahu.

A traditional chant (*Kūnihi Ka`ena, Holo i ka Mālie*), composed by Hi`iaka on her homeward journey to Hawai`i Island with Lohiau and Wahine`ōma`o, speaks of the notable place names throughout the Wai`anae District (Emerson 1993:157 & Theodore Kelsey Notes). A key theme throughout is the intense heat of the sun for which Wai`anae was renown. The overbearing heat was offset by the gentle, cooling breezes of the *kaiāulu* wind made famous in both *oli* (chant) and *mele* (song) of the Hawaiian people. Thus, the *`ōlelo no`eau* (proverb), *Ola `O Wai`anae i ka malu kaiāulu* or “Wai`anae survives in the shade of the kaiāulu wind” (Judd 1930:54). Following is a poetic description of Wai`anae which extols its virtues:

... Wai`anae of the gentle Kaiāulu wind, the sweet waters of `Eku, the thick poi of Pāhoa, the stringy 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.
(Kamakau 1991:106)

It was at Ka`ena, in Wai`anae, that Kawelo became an expert at fishing. The chiefs Pōka`ī and Mō`eke made Wai`anae their home and it was Pōka`ī who planted the renowned coconut grove at Malaea which is spoken of in chants and songs (Kamakau 1991:106, 68). (The grove no longer exists.) The Māui legends originate in Wai`anae where the super-hero and demi-god began his humble origins at Ulehawa.

Wai`anae is home to the *leimoku* surf and the *kaiāulu* wind. Mt. Ka`ala in Wai`anae, and the highest mountain peak on O`ahu (4003 ft.), is where the pig-god, Kamapua`a, made his home. Ka`ala is also home to Kōina, the goddess who sends an *`iwa* bird to assist weary travelers who

have lost their way. At Ka`ala grows the sweet *maile lau li`i* (*Alyxia olivaeformis*) and the fragrant *palapalai* (*Microlepidia strigosa*). Sacred to the goddess Laka, the patron of *hula*, these plants are still sought after by *hula* dancers for adornment.

Kamehameha I unsuccessfully launched his fleet of war canoes from Wai`anae in an attempt to conquer Kaua`i. The fleet was capsized by a strong wind called *kūlepe* in the Ka`ie`iewaho Channel off the leeward coast and the warriors were forced to return to shore (Kamakau 1992:173).

Marginal environmental conditions along the Wai`anae coast played a critical part in shaping the attitude and spirit of Wai`anae residents. The independent spirit of many residents is often attributed to the conditioning of generations having to cope with harsh environments, as many areas of Wai`anae, especially Nānākuli, were notorious for their inhospitable climate. The first Western description of the Wai`anae Coast comes from the explorer, George Vancouver, who described Wai`anae as "composed of one barren rocky waste, nearly destitute of verdure, cultivation or inhabitants . . ." (Vancouver, 1798: 217).

The leeward area between Mākua and Nānākuli was especially noted for its susceptibility to drought and famine. Despite the generally harsh environment, a small variety of indigenous crops were cultivated throughout the district. The lowlands provided *`uala* (*Ipomoea batatas*) and *niu* (*Cocos nucifera*), and the inland valley areas were planted in *kalo* (*Colocasia esculenta*) and *wauke* (*Broussonetia papyrifera*). The upland forest regions provided various woods needed for weapons and canoes.

Traditional accounts of Wai`anae also portray a land of dual personality: a refuge for the dispossessed and an area inhabited by the rebellious and outlaws. Certain landmarks in Wai`anae attest to this dichotomy. Kawiwi, a mountain between Wai`anae and Mākaha *Ahupua`a*, was dedicated as a refuge by priests during time of war (McAllister, 1933; Kamakau, 1961). Pōka`i Bay was used as a school administered by the exiled high class priest and *kahuna* who took refuge in Wai`anae after Kamehameha Nui gained control of O`ahu (Sterling and Summers, 1978:68). It was also near Pōka`i Bay, at a place named Pu`u Kāhea, that the eighteenth-century prophet and *kahuna nui* of O`ahu, Ka`ōpuluhulu, made his last famous prophecy before he was killed at Pu`uloa (*Ibid.*:71).

B. Nānākuli *Ahupua`a*

The *ahupua`a* of Nānākuli encompasses 1,062 acres and is bounded on the east by Honouliuli in the `Ewa District and on the west by Lualualei in the Wai`anae District. Nānākuli was perceived as an especially arid and desolate place. Lacking perennial streams, agricultural resources were sparse due to lack of water and the poor quality of the soil. The harsh environmental conditions offered little opportunity for large-scale settlement. Historical accounts attest to sparse coastal populations in Nānākuli as well as its neighboring *ahupua`a* of Lualualei. It is likely that there were small, scattered settlements here and there whose main subsistence was the *`uala* (*Ipomoea batatas*) or sweet potato. Handy writes:

. . . sweet potatoes were planted on the dry slopes of Nanakuli, Lualualei, Wai`anae-kai, and the other small valleys as far as Makua. With the exception of Wai`anae-kai, the sweet potato was the staple for the inhabitants of this dry section . . .
(Handy 1940:156)

Mary Kawena Pukui relates the following information as told to her by Simeona Nawa`a in 1945, who in turn heard it from an old Hawaiian woman by the name of Kanui:

In the olden days, this place was sparsely inhabited because of the scarcity of water. The fishing was good but planting was poor. When it rained, some sweet potatoes would be put into the ground, but the crops were always poor and miserable.

There were brackish pools from which they obtained their drinking water and it is only when they went to the upland of Wai`anae that they were able to get fresh water. They spent most of their time fishing and most of the fish they caught were dried as gifts for friends and relatives in the upland. Sometimes they carried dried and fresh fish to these people in the upland and in exchange received poi and other vegetable foods. And as often as not, it was the people of the upland who came with their products and went home with fish. (*In Sterling and Summers 1978:62*)

Compensating for the agricultural deficit, the coastal areas were rich in marine resources – fish and *limu* (seaweeds) – which offered additional food resources (Handy & Handy 1972:275, 277). In addition, trade with people in the uplands supplemented their diet with fresh vegetable items which were difficult to grow due to poor soil quality and an insufficient water supply.

There are several stories (Sterling & Summers 1978) which attempt to explain the origin of the name “Nānākuli”. An ancient story about the meaning of Nānākuli (look to the knees) goes back to the time of Ka`ōpuluhulu, the renowned *kahuna* who lived during the rule of Kahahana, a *kapu* chief of O`ahu. The meaning is in reference to Kahahana’s turning a deaf ear to advice, for which Ka`ōpuluhulu tattooed his knees as an expression of his disapproval (Kamakau 1992:128). Another version offers the explanation that Nānākuli means to “look deaf” and refers to the people being ashamed to invite strangers to stop at their village because there was no water to offer and they could not extend their hospitality. Thus, the villagers would pretend to be deaf when visitors called out to them (Sterling & Summers 1978:62). Several other versions make reference to variant translations of *kuli*, which can be translated as “knees” or “loud, deafening noise”. A similar story in regard to “looking at the knees” is said to be connected to Kū`ali`i, a famous chief of O`ahu. After a particularly long and tiring journey, Kū`ali`i’s attendants wanted to see and press his knees in an attempt to relieve the fatigue (*Ibid.*). Yet, another, and perhaps, later version tells that the *kaona* (hidden meaning) of Nānākuli refers to the mountain range which resembles the *ule* or penis of a man. Thus, Nānākuli means to “look at the penis” (Mrs. Eli to Fred Cachola; Cachola interview *in* Mc Guire and Hammatt 2000). And, lastly, Lehua Kapaku, a resident of Nānākuli since 1960, believes the name, Nānākuli, is a reference to the Maui legends and Maui’s sister, Nānāku`ulei (“look to my pretty lei”) (Kapaku interview *in* Mc Guire and Hammatt 2000).

It can be seen from the above stories that “Nānākuli” has taken on several different meanings over time. In a Hawaiian framework, all of these stories are valid because they held meaning for the people living during those particular times. Place names are significant because they document history and relate details of a specific geographical area. When repeating the name, the story that accompanies the name is also remembered and told, thus perpetuating the oral tradition of passing on knowledge in Hawaiian culture.

Early Historic Period

Native accounts and those of early foreign observers provide only brief sketches of indigenous life and culture in Nānākuli. In January of 1778, Captain James Cook sighted the Wai`anae Coast from a distance, but did not stop to anchor. It was not until 15 years later that Captain George Vancouver approached the coast of Wai`anae from Pu`uloa and wrote his impressions in the ship's log:

The few inhabitants who visited us [in canoes] from the village earnestly intreated [*sic.*] our anchoring . . . And [they] told us, that if we would stay until morning, their chief would be on board with a number of hogs and a great quantity of vegetables; but that he would not visit us then because the day was *taboo poory* [a *kapu* day]. The face of the country did not however, promise an abundant supply [of water]; the situation was exposed. (Vancouver *in* McAllister 1933:113)

Vancouver made no mention of any villages in Nānākuli and, in fact, only mentions the village of Wai`anae in his journal entry (*Ibid.* 112).

One of the first references of a coastal settlement in Nānākuli comes from a description by John Papa `Ī`Ī who describes a visit to his aunt, Kāneiakama. Little is known about his aunt except that she and her husband, Pa`akonia, "were bracelet makers and residents of that land of the foamy sea" and "were well known" (`Ī`Ī 1983:26). `Ī`Ī notes that his aunt was "a great favorite of the king". Ka`ahumanu was fond of Kaneiakama and admired her skill in composing chants. Because of this, perhaps, the land at Waianae (Pāhoa Uka) was given to Kaneiakama and her husband (*Ibid.*) `Ī`Ī visited his aunt three times, twice at Pāhoa Uka and once at Nānākuli. He writes:

He had heard that his aunt was at Nanakuli, so he and his attendant departed by way of Puu o Kapolei to Waimanalo and on to Nanakuli. There he found his aunt and her husband who were in charge of the fishing.

During his visit Ii observed how the children of Nanakuli produced a long quavering sound while chanting. This was performed while the children sat on the branches of breadfruit trees . . . Thus did Ii enjoy himself with the children of Nanakuli . . . (*Ibid.*:29)

It is disappointing that `Ī`Ī did not provide more of a description of the settlement and life at Nānākuli during this visit, *circa* 1808.

Other early visitors mention a small settlement along the Nānākuli coast (Hunnewell 1901:19; Chamberlain 1957:38). In relation to this settlement, McAllister identified only one *heiau*, Ilihune Heiau, which was located near the shore.

The Rev. William Ellis visited the Hawaiian Islands in 1823. At that time, he estimated the population on the island of O`ahu to be about 20,000 (Ellis 1974:19). The missionaries were the first to gather population statistics throughout the various districts on each island. The first census figures were gathered from 1831-1832 and 1835-1836. Separate figures were not given for Nānākuli, but it is likely that the count was incorporated into the numbers for the *ahupua`a* of Wai`anae.

Nānākuli, no doubt, sustained a sparse population, but to what extent is not exactly known. The historic references to Nānākuli are scant. The majority of the references indicate a small coastal population, with little mention of habitation in the upper valley. Environmental factors such as the dry, arid climate, low rainfall and geologic limitations – “much of the seaward portion of the valley is uplifted coral limestone that in some areas is thinly disguised with a shallow layer of soil” (Kelly *in* Haun, *et al.*, 1991:310) – were likely constraints upon population density along the coast.

More recent archaeological work conducted by Dr. Ross Cordy (1998) of the State Historic Preservation Division indicates that there was perhaps a more substantial inland settlement which might not have been apparent to visitors along the coast. Twenty-six house sites, and a small shrine were identified in upper Nānākuli Valley (Cordy 1998:33).

Mid-1800's: Land Commission Awards (LCAs)

The Organic Acts of 1845 and 1846 initiated the process of the *Māhele* - the division of Hawaiian lands - which introduced private property into Hawaiian society. In 1848, the crown and the *ali`i* (royalty) received their land titles. *Kuleana* awards for individual parcels within the *ahupua`a* were subsequently granted in 1850.

At the time of the *Māhele*, the *ahupua`a* of Wai`anae, which at that time included Nānākuli, was listed as *Crown* lands and was claimed by King Kamehameha III as his personal property (Indices of Awards:28). As such, the land was under the direct control of the King. Many of the chiefs had run up huge debts to American merchants throughout the early historic period and continuing into the mid-1800s. A common practice, at the time, was to lease (or mortgage) large portions of unused land to other high chiefs and foreigners to generate income and pay off these earlier debts acquired.

Until the passage of the Act of January 3, 1865, which made Crown Lands inalienable, Kamehameha III and his successors did as they pleased with the Crown Lands, selling, leasing, and mortgaging them at will. (Chinen 1958:27)

Not everyone who was eligible to apply for *kuleana* lands did so and, further, not all claims filed were awarded. Out of the potential 1,500,00 acres of Government lands made available for native Hawaiians throughout Hawai`i, “less than 30,000 acres of land were awarded to the native tenants” (Chinen 1958: 31).

In Nānākuli, there was only one application for quiet title to lands during the time of the *Māhele*. Even though this award was not granted, it does give some insight into land use in Nānākuli Valley. In testimony taken from the Native Register, Kuluahi speaks of his lands in the *ili* of Hāpai:

To the Land Commissioners: *Ili* of Hapai, Ahupua`a of Nanakuli, Wai`anae District, O`ahu. I, the one whose name is below, have a *muliwai*, a pond, a cultivated *kula* and for firewood also, a valley planted in *wauke mauka*, and a *kula* house lot. It is finished. Kuluahi, X, his mark. January 17, 1848. (Native Register, Vol. 5:342)

The exact location of Hāpai *ili* is not known, however, it seems likely that part of the claim was located near the coast at the mouth of Nānākuli Stream (*muliwai*), as the testimony indicates some

kind of aquacultural resource was being utilized. Agricultural activity, at least on a small scale, was taking place in dry areas (*kula*), as well as a houselot being located there. Further *ma uka*, *wauke* was cultivated. *Wauke* (*Broussonetia papyrifera*) was the preferred plant for making *kapa* (cloth). *Wauke* requires a moist climate and it was usually cultivated close to habitation sites, along streams, *lo`i* and at the lower borders of wet forests (Krauss 1993:60).

This sole, unawarded *Māhele* claim is not indicative of the total population within Nānākuli Valley. As was the case with neighboring Lualualei, there were other people who lived in Nānākuli but who did not file land claims. Tax records for Nānākuli list eight people who paid a total of \$26 for taxes in 1855 (Hawai`i State Archives: J.W. Makalena Tax Records). This suggests Nānākuli was one of the least populated *ahupua`a* on O`ahu at that time. The tax payment in currency also suggests that much of the traditional lifestyle was ending and that people were switching over to a monetary economic system. Seventy years later, the population statistics would reflect very little growth. In the mid-1920s, not counting squatters, there were only ten residents in all of Nānākuli (McGrath 1973: 107).

1850 - 1900

Much of the Crown lands, of which Nānākuli was a part, were either sold, borrowed against as collateral or leased to generate income for the King (Kamehameha III) and his family. In Nānākuli, large portions were leased for the purpose of ranching.

The first longhorn cattle were brought to O`ahu from Hawai`i Island in 1809 by John Young and Kamehameha I (Kamakau 1992:268). By the mid-1800s, the back of Nānākuli Valley appears to have been used solely for ranching purposes and probably did not support permanent habitation by this time. James Dowsett, descendant of a British sea captain, was an entrepreneur of sorts and dabbled in many different business ventures, such as:

. . . a whaling fleet, a dairy, a salt works, an extensive trade in *awa* (a Hawaiian narcotic drink) and numerous land holdings . . . He also ran cattle at different times in Nānākuli, Mikilua and Lualualei. (McGrath 1973:32)

In 1880, George Bowser traveled through Wai`anae. At the time of Bower's visit, sugar cane production had not yet reached Lualualei or Nānākuli from Wai`anae Valley. Bowser wrote about Nānākuli:

From Lualualei Valley to the Nanakuli Valley I had a rather dreary ride of three miles. The intervening country towards the sea is barren, with a little pasturage at the base of the mountains. The track, however, is in very good order, much better than I expected to find it, looking to the mountainous and rocky character of the country through which it passes. At Nanakuli and at Hoaeae, close adjoining, the Messrs. Robinson have cattle ranches. The pasture here cannot be compared with that in the valleys I had just left behind, but inland among the mountain ranges it is much better. (Bowser 1880:494)

In 1894, Link McCandless entered the ranching scene:

. . . he and a man named Tom King chartered the brigantine Oakland in Seattle, filled her hold with cattle and the cabins with feed, and sailed for Hawai`i. By the

turn of the century, McCandless' ranching empire covered much of the Wai`anae Coast, including land at Nanakuli . . . (McGrath 1973:31)

With ranching utilizing much of the land area in Nānākuli, it is likely that the few people still living there during the development of the sugar industry, in the late 1800s, eventually relocated to Wai`anae which became a bustling sugar town.

Early 1900's to Present

Regular homesteading came to the greater Wai`anae Coast in the early 1900s (1903-1909), but due to its lack of water to support settlement, Nānākuli was overlooked.

The early wave of homesteading passed by dry, barren Nānākuli. Because of its water shortage, parched Nānākuli had never attracted many residents. It remained a *kiawe* wilderness. Yet, the very fact that nobody wanted it turned the area into a kind of informal public park. Its magnificent beaches attracted a growing colony of squatters from all over O`ahu who were running out of places to camp . . . The entire island had been hung with *Kapu* signs. But not Nānākuli. There the tawny, crescent beaches were open to anyone. Some came for the summer. Others camped all year round. Most of them were Hawaiians. (McGrath 1973:103)

Hawaiian homesteading finally came to Nānākuli in the late 1920s and 1930s. Under the Hawaiian Homes Commission Act, nearly 200,000 acres were opened up for homesteaders of Hawaiian blood. Previous leases of Nānākuli land had expired at this time and the land was subdivided for residential lots. By 1930, over 200 residential lots had been awarded (McGrath 1973:108-118).

World War II greatly affected the Wai`anae Coast and Nānākuli Valley. Military troops were sent in to train and do maneuvers. Concrete bunkers and gun emplacements were built on the beaches and ridges and barbed wire was strung along the beaches. Camp Andrews was developed in Nānākuli as a rest and recreation area for military personnel. The camp was deactivated after the war. After WWII ended, the lower portions of Nānākuli Valley were further developed into residential lots. The land *ma uka* of the current residential lots continues to be leased and utilized for cattle grazing, horse ranches, and pig and poultry operations.

C. Lualualei Ahupua`a

Lualualei comprises approximately 15,000 acres and is the largest valley in the Wai`anae district. There are two traditional meanings given to the name Lualualei. One meaning, "flexible wreath" is attributed to a battle formation used by Mā`ilikūkahi against four invading armies in the battle of Kīpapa in the early 15th century. A second, and perhaps more recent, meaning offered by John Papa `Īī is "beloved one spared". This meaning relates to a story of a relative who was suspected of wearing the king's *malo* (loincloth). The punishment was death by fire. `Īī writes:

The company, somewhat in the nature of prisoners spent a night at Lualualei. There was a fish pond there on the plain and that was where the night was spent . . .

After several days had passed, the proclamation from the king was given by Kula`inamoku, that there was no death and that Kalakua did not wear the king's loin cloth. Thus was the family of Luluku spared a cruel death. For that reason, a child born in the family later was named Lualualei (1959:23).

Mary Pukui believed the first meaning, "flexible wreath" to be the more appropriate one for Lualualei (Sterling & Summers 1978:63). According to Marion Kelly, the fish pond on the plain is Puehu fish pond which is actually located just over the border in Wai`anae (*in* Haun 1991:317). The fish pond no longer exists today and was probably destroyed during the sugar plantation era. Perhaps, a third association to the name Lualualei is an older reference to one of Māui's sisters who went by the same name.

Numerous Hawaiian legends, in addition to archaeological evidence, reveal the Wai`anae coast and *ma uka* interior to be an important center of Hawaiian history. It is here, in Wai`anae, that the famous exploits of Māuiakalana (Māiu) are said to have originated. Traditional accounts of Lualualei focus on the mischievous adventures of the demi-god Māui. It was here that Māui learned the secret of making fire for mankind and perfected his fishing skills. Other famous accounts tell of the place where Māui's adzes were made, and of the magic fishhook, Mānaiakalani and the snare for catching the sun, and his kite-flying expedition. Pu`u Heleakalā is the ridge that separates Nānākuli from Lualualei. It was at Pu`u Heleakalā where Hina, Māui's mother, lived in a cave and made her *kapa*.

Samuel Kamakau tells us that Māui's genealogy can be traced from the `Ulu line thru Nana`ie:

. . . Wawena lived with Hina-mahuia, and Akalana, a male, was born; Akalana lived with Hina-kawea, and Maui-mua, Maui-waena, Maui-ki`iki`i, and Maui-akalana, all males, were born.

Ulehawa and Kaolae, on the south side of Waianae, Oahu, was their birthplace. There may be seen the things left by Maui-akalana and other famous things: the *tapa*-beating cave of Hina, the fishhook called Manai-a-kalani, the snare for catching the sun, and the places where Maui's adzes were made and where he did his deeds. However, Maui-akalana went to Kahiki after the birth of his children in Hawai`i. (Kamakau 1991:135)

The Māui rock, Site 148 in McAllister's *Archaeology of O`ahu*, is located within the Garden Grove complex at 87-1550 Farrington Highway in Lualualei. In 1930 when McAllister conducted his fieldwork he noted:

. . . it was here that Māui reposed and sunned himself. . . The large rock is now split in half and adorned with many small, oddly shaped rocks. It is said to be bad fortune to build one's house across a line drawn directly from the rock to the shore. (1933: 110)

The "small, oddly shaped rocks" McAllister speaks of are no longer present and cannot be seen today. The Māui rock is currently overgrown with young Chinese banyan saplings (*Ficus retusa*), grasses, and weeds.

In an interview with Fred Cachola (*in* Mc Guire & Hammatt 2000), he offers another explanation of the Māui rock as told to him by a Hawaiian *kupuna* (elder). At sunrise, from the location of this rock, one can see the profile of Māui reposing in the mountain range behind. As Mr Cachola tells it, "It's a composition of different mountain ranges. But when the sun is coming up in the back of that, it looks like one silhouette. And it's just beautiful. But when the sun rises, then it disappears. You only see it early in the morning when you see that silhouette."

The Cachola interview also revealed that in relation to the Garden Grove residential complex is a known "night marchers" path leading to the beach. The same *kupuna* indicated to Mr. Cachola that he was the seventh watchman to be hired on the job because the previous six night watchmen all quit in the middle of the night due to "strange" occurrences, ". . . things start flying around and things start moving and all this unusual events going on. And they see things too" (*Ibid.*).

McAllister identified two *heiau* in Lualualei: Nioiula *heiau* (Site 149) and Kakioe *heiau* (Site 151). Site 149, located on Hālonā ridge and southwest of the Forest Reserve line, is believed to be the *heiau* where Kewalo offered a human sacrifice to the gods. The *heiau* is said to be of *po'okanaka* class and dates back to the time of Kāku'ihewa. Site 151 was located at Pūhāwai. Thomas Thrum described it as "A small *heiau* of which nothing remains but its sacred spring, and the sound of its drums and conchs on the nights of Kane" (*in* Sterling & Summers 1978:66).

Probable house sites (Site 150) were also identified by McAllister in the "middle of Lualualei at the foot of the cliffs, Pahoa" (*Ibid.*). These house sites are located within the lands of the Lualualei Naval Reservation, well *ma uka* and outside of the proposed WCEAR route.

Early Historic Period

Nānākuli and Lualualei share some similarities. Like Nānākuli, rainfall was sparse, water was scarce near the shore and the Lualualei coastline offered little opportunity for large-scale settlement. Western historical accounts are few and they attest to a sparse coastal population at Lualualei as well (Hunnewell 1909:19; Chamberlain 1957:38). It appears that the coastal population was limited to isolated, perhaps temporary, habitations supported by marine resources. Environmental components including the dry climate – less than 20 inches of rainfall on the coast, and geologic limitations – "much of the seaward portion of the valley is uplifted coral limestone that in some areas is thinly disguised with a shallow layer of soil (Kelly *in* Haun 1991:310) – were likely determinative constraints upon population density along the Lualualei coast. However, there is evidence of an upland settlement in relation to a stream at Puhawai which was fed by underground springs. Archaeological evidence also indicates extensive remnants of *lo'i* terraces at Puhawai (*Ibid.*). Handy notes:

According to Mrs. Hanakahi, living on a Nanakuli Homestead, there is a place far up in Lualualei, "the Navy place," called Kapuhawai, where the sacred spring was used to water carefully tended terraces; she says that in these neglected terraces, taro still grows wild from the ancient plantings, thriving in the rainfall as there is, and people go up into the hills to gather it, as it is regarded as "fine eating". (1940:83)

While the Hawaiian historians do report on Lualualei in regard to some of the associated cultural legends, the presence of trails and a fishpond, they give no indication of any sizeable population

within the *ahupua`a*. As an indication of population in the mid-19th century, the 1855 tax records reveal there were a total of 11 adult taxpayers in Pūhāwai.

Mid-1800's: Land Commission Awards (LCAs)

Lualualei was claimed as Crown Lands during the *Māhele*. A total of twelve land claims were made, but only six were actually awarded. All six awards were located upland in the `ili of Pūhāwai. From the claims it can be determined that at least eight families were living in Pūhāwai at the time of the *Māhele* in 1848. Together, they cultivated a minimum of 163 *lo`i*. In addition, dryland crops were grown on the *kula* (plains), *wauke* was being cultivated and one claimant was making salt. All six awards cluster along the only stream at Pūhāwai. The numerous *lo`i* mentioned in the claims indicate the land was ideal for growing wetland taro and that this livelihood was actively pursued by the awardees.

1850 - 1900

In the latter half of the 19th century, ranching dominated the history of Lualualei as it was one of the first areas to be utilized for raising cattle on O`ahu. Bureau of Conveyance records indicate William Jarrett leased approximately 17,000 acres of land, mostly in Lualualei, from Kamehameha III in 1851 (B.C. Liber 4:616-618). This was the beginnings of Lualualei Ranch. In 1864, Jarrett took on George Gailbraith as a partner. Five years later, he sold his son's half-interest in the ranch to James Dowsett. During the time that Jarrett was involved with the ranch, a race track for horses was built on the Mā`ili plains (McGrath 1973:31).

In 1880, George Bowser traveled through Wai`anae and wrote about Lualualei in his journal:

Leaving Wai`anae, a ride of about two miles brought me to the Lualualei Valley, another romantic place opening to the sea and surrounded in every direction by high mountains. This valley is occupied as a grazing farm by Messrs. Dowsett & Galbraith, who lease some sixteen thousand acres from the Crown. Its dimensions do not differ materially from those of the Wai`anae Valley, except that it is broader – say, two miles in width by a length of six or seven miles. The hills which enclose it, however, are not so precipitous as those at Wai`anae, and have, therefore, more grazing land on their lower slopes, a circumstance which adds greatly to the value of the property as a stock farm. Although only occupied for grazing purposes at present, there is nothing in the nature of the soil to prevent the cultivation of the sugar cane, Indian corn, etc. Arrangements for irrigation, however, will be a necessary preliminary to cultivation. (Bowser 1880:493-494)

Bowser's comments imply that though water was still a problem, Lualualei seemed to have more potential for development than Nānākuli.

An 1894 description of Lualualei by the Commissioner of Crown Lands described the land as "... one of the best and most valuable of the Crown lands on the Island of Oahu ... surpassing any of the other lands for richness and great fertility of the soil" (Commissioner of Crown Lands, 1894:36). By this time, Link McCandless had entered the scene and was ranching 4,000 acres at Lualualei (McGrath 1973:31).

The sugar industry came to the Wai`anae coast in 1878 when the first sugar cane was planted in upper Wai`anae Valley. By 1892, at least 300 acres of cane was planted in Lualualei. In addition, a railroad, irrigation ditches and flumes, reservoirs and plantation housing were constructed to support the industry. Although the quantity of sugar planted was small compared to Wai`anae and Mākaha, the development of infrastructure required for such an operation would have altered much of Lualualei's central and lower valley landscapes.

Early 1900's to Present

By 1901, the Wai`anae Sugar Company had obtained a five-year lease on 3,332 acres of land at Lualualei, to be used for raising cane as well as for ranching (Commissioner of Public Lands 1902). Sugar and ranching continued to dominate the history of Lualualei during the early years of the 20th century. The determining factor in the success of Lualualei for sugar production was always the water.

In 1902, the Government ran ads in the local newspapers stating their intent to open up land in Lualualei for homesteads. Due to the lack of water, the lots were classified as second class pastoral land, rather than agricultural land. The lots were sold between 1903 and 1912. By the early 1920s, about forty families had settled there (Kelly *in* Haun 1991:331-332).

Another major influence in Lualualei, during the first half of the 20th century, was the military. By 1929, over 8,184 acres of the McCandless Cattle Ranch had been condemned and purchased by the U.S. Navy for the construction of a Naval Ammunition Depot for the ships of Pearl Harbor Naval Base. The construction of Naval Magazine - LLL and Radio Transmission Facility (RTF) took place in Lualualei between 1930 and 1935 (Kelly *in* Haun 1991:339-341). In 1971, the Navy began sub-leasing some of their lands for agricultural uses, mainly for grazing and bee keeping. The presence of the military at Lualualei has boosted the economy of Lualualei by providing jobs to residents over the years. As in Nānākuli, the lower portions of Lualualei Valley were developed into residential lots after WWII.

Additional Segment: Helelua Place - Lualualei Naval Road

Located directly behind the Sac-N-Save complex in Lualualei and a drainage channel is a large vacant lot consisting of two parcels (TMK: 8-7-08: 76 and 77). In the northwest corner of Parcel 77, near Lualualei Naval Road, a small group of houses can be seen. At one time, this residential housing area extended almost to the drainage channel behind Sac-N-Save. Some residents still refer to this group of homes as "Nakatani Housing", named after the Nakatani family who for years owned the Sac-N-Save as well as both Parcels 76 and 77. Up until recently, Parcel 76 (adjacent to Pu`u Heleakalā Community Association) was zoned for agriculture and at one time, the Nakatani's used to raise pigs there (James Aki, Pers. Comm., 10/17/01). The parcel was rezoned to R-5 about five or six years ago (Andrew Sato, Pers. Comm., 10/22/01).

Vegetation throughout the lot is very sparse with predominately introduced grasses and weeds with scattered *koa haole* and *kiawe*. Talk-story with Lualualei residents indicate both lots have been severely modified. There is evidence of ground disturbance, bull dozing and grubbing. There are numerous scattered piles of basalt and limestone boulders, and remnant pieces of cement, possibly old house foundations. There is scattered rubbish throughout indicating the vacant lots are used also as dumping grounds. At one time, the Nakatani family also had a junkyard on part

of the property which might account for some of the old auto parts scattered about (William Aila, Pers. Comm., 10/12/01)

Talk-story with various community residents did not turn up any new information regarding cultural resources or traditional legends relative to Parcels 76 and 77. There are stories of a “*menehune*” trail that runs along the Nānākuli side of the Pu`u Haleakalā community, as well as stories of people seeing *uhane* (spirits) and several stories of “bad luck” for the occupants of certain residences. However, there were no specific cultural traditions indicated or shared about Parcels 76 and 77.

D. Wai`anae *Ahupua`a*

Hawaiian legends, as well as archaeological evidence, reveal that the Wai`anae coast and *ma uka* interior have been important centers of Hawaiian prehistory and early history. During traditional times, the *ahupua`a* of Wai`anae was actually differentiated between *kai* and *uka*. Wai`anae Uka ran from the crest of the Wai`anae Mountains to the crest of the Ko`olau Mountains. In 1909, the *ahupua`a* boundaries changed and Wai`anae Uka was added to the Waialua district. In 1913 Wai`anae Uka was incorporated into the newly created district of Wahiawa (Coulter 1935:220-221).

Though the coast is arid and dry, Wai`anae *Ahupua`a* had two well-known water sources, Kaupuni Stream [also called Wai`anae Stream] near Pōka`ī and Keko`o Spring at Kamaile, which supported and contributed to some of the earliest and largest settlements in the Wai`anae District. In addition, Puehu Fishpond was located in Wai`anae at the base of Kaupuni Stream, about 500 feet from the beach (McAllister 1933:113).

The bay at Pōka`ī is said to be named after the famous voyaging chief from Kahiki of the same name. Pōka`ī is also credited with planting the coconut grove along Kaupuni Stream. Famous in chant and song, this grove was “the largest and best known coconut grove on O`ahu (Pukui 1983:160; O.N. #1476). A poetic reference to the grove was “*Ka malu niu o Pōka`ī*”. Sadly, the original coconut grove does not exist today.

It has been said that the *heiau* at Pōka`ī Bay was named after the supernatural dog, Kū`īlioloa, which legends refer to as a protector of travelers. Other stories have it that Kū`īlioloa fought with Kamapua`a and was defeated (Pukui, *et al.*, 1986:120). This *heiau* was also said to be used for “learning and a temple for training” (James 1991:36).

Shark traditions also play a part in the prehistory of Wai`anae. Kamohoali`i, Pele’s favorite and older brother, fell in love with a beautiful maiden from Wai`anae. They soon had a *kupua*-child, half-man and half-shark, who killed and devoured many people along the Wai`anae coast before he was captured and killed. The *heiau* of Kamoali`i (Site 156), named after Pele’s brother, was located on Pu`u Kāhea. The *heiau* has since been destroyed, “even to its foundation” (Thrum *in* McAllister 1933:114).

Pu`u Kāhea (Calling Hill) has several legendary associations as well. Kahahana was said to have his residence there. This was also where the prophet, Ka`ōpuluhulu uttered his prophecy foretelling that foreigners would come from across the sea and take over the land. Pu`u Kāhea was also the scene of some of Kamapua`a’s mischievous escapades. He was caught stealing taro by the

angry villagers who promptly prepared an *imu* to roast the demi-god, but Kamapua`a used his supernatural powers to escape (Sterling & Summers 1978:72).

The last resistance of the O`ahu chiefs against the invading forces of Kahekili from Maui was at Kawiwi Hill on the north wall of Wai`anae Valley. It was here that the chiefs of Kona (Honolulu), `Ewa, Wai`anae, Waialua and Ko`olau regrouped for a last stand (circa 1780). During the siege, many died of starvation or were flung over the precipice. Kahekili died in 1794. A year later, Kamehameha I invaded and conquered O`ahu. As in the past, the Wai`anae Coast became a refuge for opponents of the new order. As the lands of the conquered O`ahuans were seized and divided among the comrades of Kamehameha, the dispossessed people fled in large numbers to Wai`anae and settled there. To preserve the folklore of the island, the *kilokilo hōkū* (astrologers) founded a school at Pōka`ī to instruct the young men and women of O`ahu in history, astronomy, navigation and, especially, the genealogies of the ancient O`ahu chiefs (Sterling & Summers 1978:68).

In 1796, while on his way to invade Kaua`i, Kamehameha I stopped at Wai`anae with his war fleet of canoes. Wai`anae tradition maintains that Kamehameha remained on the coast long enough to rededicate two *heiau* to Kūka`ilimoku, his war god. It was said the gods were angered by this and Kamehameha was punished by a storm which overturned his fleet, forcing them to return to Wai`anae.

Early Historic Period

In his description of the Wai`anae coast, Vancouver, in his 1793 journal entry, also described the village at Pōka`ī. He writes:

Nearly in the middle of this side of the island is the only village we had seen westward from Opooroah [Pu`uloa]. In its neighbourhood [*sic.*] the bases of the mountains retire further from the sea-shore, and a 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 . . . (Vancouver 1967:217)

As far as the rest of the coast, Vancouver reported seeing only "a few straggling fishermen's huts" and "a small grove of shabby cocoanut trees" (Handy & Handy 1972:270-271). Influenced by the arid coastal environment, Vancouver continued onward and did not anchor at Wai`anae. Vancouver may have been surprised had he chosen to stop at Wai`anae Village. Even though the dry, arid coast presented a dismal picture, the ocean provided an abundant supply of fish, the lowlands provided *uala* (*Ipomoea batatas*) and *niu* (*Cocos nucifera*), and the inland valley area was extensively planted in *kalo* (*Colocasia esculenta*) and *wauke* (*Broussonetia papyrifera*). The upland forest regions provided various woods for weapons and canoes, access to birds for their feathers and other forest resources. By this time, there was probably a small variety of introduced vegetables being planted in the upper valley as well. Handy and Handy wrote about Wai`anae:

Wai`anae Valley supported a number of areas where wet taro was planted, watered by streams from the Wai`anae range, streams whose flows were probably constant owing to the high bogs on top of the mountains . . . Undoubtedly there were also small settlements subsisting mainly on sweet potato, in the valleys where constant

streams were lacking (Nanakuli and Makua). In famine times, then, there was reef fishing, and the Wai`anae Mountains had wild banana, *tī* fern, and other roots that were edible . . . (1972:275-276

By 1811, sandalwood merchants began actively exploiting the Hawai`i market and huge amounts of sandalwood were exported to China. (Traditionally, Hawaiians used sandalwood for medicinal purposes and as a scent to perfume their *kapa*.) Kamehameha I and a few other chiefs controlled the sandalwood trade. Wai`anae had extensive stands of sandalwood and especially between 1816-1818, the sandalwood forests were extensively harvested to repay the chiefs' debts. Sandalwood continued to be harvested until around 1829 or 1830 when the supply had been exhausted (Kuykendall 1938:88).

In 1835, the missionary census listed 1,654 residents on the Wai`anae Coast. In late 1853, the Wai`anae Coast was decimated by a smallpox epidemic. The 1855 tax assessment shows 62 taxpayers for Wai`anae Kai and 182 taxpayers for all of the Wai`anae District (J. Makalena tax records; Hawai`i State Archives; McGrath 1973:29).

Mid-1800's: Land Commission Awards (LCAs)

Wai`anae *Ahupua`a* was listed as Crown Lands in the *Māhele*. The records indicate there were 162 total claims for Wai`anae. Of these claims, 39 were in the `ili of Kamaile, of which 27 were awarded. Because of Keko`o Spring, the Kamaile `ili of Wai`anae *Ahupua`a* supported a dense concentration of *kuleana*. Most residents claimed several *lo`i* (between 1 and 18) and a *kula*. Many residents also claimed salt deposits or salt lands. Common boundary markers include fishponds and land fences. In addition, there is a mention of a *ma uka* trail, a school house, a coconut grove, a pig pen, *hala* trees, bullrushes, the Kikahi *Heiau* and Pōhaku Kamapua`a. Kamaile was the breadbasket for Wai`anae and supported the largest coastal settlement in the district. Intensive land use, coupled with ready access to marine resources including salt pans and fishponds made this an ideal spot for habitation. The number of *heiau* and significant landmarks in Kamaile and adjacent Pōka`ī and Pāhoa `ili attest to the religious and political importance of the area.

1850 - 1900

The development of the sugar industry and the establishment of the railroad had the greatest impact on the *ahupua`a* of Wai`anae during this time-period and its ripple effect was seen all along the coast.

Wai`anae Sugar Plantation

In 1878, Herman A. Widemann, a retired Supreme Court Justice, began the Wai`anae Plantation, one of the first sugar plantations on O`ahu. Roger Green reports that "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). With the hiring of 20 local Hawaiians, 15 *haole* technicians and almost 60 Chinese laborers, Widemann essentially created a town at Wai`anae to support the cultivation and processing of sugarcane. This included the building of 24 new houses and a manager's residence along with a sugar mill and various extensive irrigation systems.

In 1884, the Hawaiian Directory reported Wai`anae to be the largest settlement on the island outside of Honolulu. By 1890, the Wai`anae Sugar Plantation had over 600 acres in sugar cultivation, 12 miles of railroad and 350 laborers. The 1890 census reports 903 residents in the Wai`anae district. Wai`anae had become a bustling "sugar town".

O`ahu Railway and Land Company

The O`ahu Railway and Land Company (OR&L) signed its charter on February 4, 1889. The Railway was the brainchild of Benjamin Franklin Dillingham. Along with James Castle and others, he had invested in large tracts of land for speculation and resale, but the idea was slow to catch on because "the land lay too far from Honolulu, at least 12 miles" (McGrath 1973:54). Dillingham foresaw an economic opportunity. The railway was a means to provide transportation to the country and promote development of unoccupied lands, as well as connect with the sugar plantations in `Ewa, Wai`anae, Wai`alua and Kahuku. Construction on the railway began in March of 1889. The first length of the railway was completed and opened to the public by January 1, 1890. Five years later, on July 4, 1895 the railway finally reached Wai`anae. The Railway served the Wai`anae coast until 1946 when the Wai`anae Sugar Plantation closed down.

In the second half of the 19th century, ranching and sugar became the leading industries on the Wai`anae coast. During this time and prior to 1865, when the King's lands were declared inalienable, large tracts of Crown lands in the Wai`anae district were sold in fee simple or leased out for ranching to various entrepreneurial families like Samuel Adams in Mākua Valley, the Dowsetts in Lualualei, Nānākuli and Mikilua, the Robinson brothers in Nānākuli and the Holt clan in Mākaha. The Wai`anae Sugar Plantation began to grow sugar cane on large tracts of leased land. This new economic venture would change the landscape and put an end to traditional Hawaiian ways of life forever.

Early 1900's to Present

The sugar industry continued to dominate Wai`anae into the 20th century. In the early 1900s, the business area of Wai`anae was centered around the plantation office on Old Government Road (Dung *in* Schilz 1994:23). Sugar was "king" in Wai`anae until 1946, when the mill closed down. As with the other *ahupua`a* in the district, the military presence during WWII was a major force on the Wai`anae coast. The military provided jobs and was an economic boost to the community.

Lack of water has always been an issue on the arid Leeward Coast. The water issue has been key to the development of homes and agriculturally-based businesses. Ranching still continues, though on a much smaller scale than it did in the past. New sub-divisions and schools are being built to meet the demand of affordable homes and of those who prefer a rural atmosphere.

E. Mākaha Ahupua`a

Archaeological data suggests that a rather substantial prehistoric population once occupied the Mākaha Valley. Roger C. Green, in his summary Report No. 5, of the Makaha Valley Historical Project (1980) proposed that the earliest Hawaiian settlement (before A.D. 1100) was probably focused along the coast at the mouth of Mākaha Stream. Following this initial settlement

(sometime after A.D. 1100) exploitation of the surrounding *kula* lands prompted an expansion into the surrounding lower valley.

Radiocarbon dates obtained from "field shelters" of Site Complex 776 (50-80-07-776) located in the *kula* region of the valley reveal that the shelters, and indirectly the associated agricultural systems, were utilized before A.D. 1400. As suggested by Green, they may date as early as the 12th or 13th century.

Subsequently, as the population increased in Mākaha Valley, expansion into other *kula* regions occurred. Green argues that the *kula* expansion was not a drastic response to "Population pressures, agricultural innovation, or climatic change," as is suggested by Hommon (19776: 249-0272), but rather a rational exploitation of "More than sufficient *kula* land in Makaha for the coastal population" in an area with presumably little pressure on resources (Green 1980:74).

According to Green, various events during the 15th and early 16th centuries led to a population expansion into the upper valley regions. Green attributes this movement to "changes in the subsistence (irrigated wet taro system), emigration of a part of the population to an area of low population density, and development of a different means of social organization (in the form of social stratification and segmentation)" (Green 1890:75). Three samples obtained from an agricultural feature (Site 286) located within the upper valley yielded dates of activity and site construction during the 15th century A.D. Thus, it was during this period that wet taro agriculture was probably first practiced in the upper valley.

Early Historic Period

Earliest accounts specific to Mākaha describe a good-sized inland settlement with a school and a smaller coastal settlement with no school (Green, 1980). These accounts correlate well with a sketch drawn by Bingham in 1826 depicting only six houses along the Mākaha coastline. Green (1980: 20-21) describes Mākaha's coastal settlement as "restricted to a hamlet in a small grove of coconut trees on the Kea`au side of the valley, some other scattered houses, a few coconut trees along the beach, and a brackish-water pool that served as a fish-pond, at the mouth of the Mākaha Stream". In Mākaha, the settlement was concentrated inland where more water was available.

Mid-1800's: Land Commission Awards (LCAs)

Mākaha *Ahupua`a* had 13 claims of which 7 were awarded. Six of the seven Mākaha Land Commission Awards (LCAs) were located inland attesting to the importance of the inland settlement. The seventh Mākaha LCA claims a *muliwai* as its western boundary. According to Pukui and Elbert (1957: 236) a *muliwai* refers to a "river, river mouth; pool near mouth of a stream, as behind a sand bar, enlarged by ocean water left there by high tide; estuary." The reference to it as a boundary suggests this LCA was probably situated near the coast. Two unawarded claims also mention the *muliwai* as their boundary.

Land use information for the Mākaha LCAs is sparse. *Lo`i* lands and *kula* lands were mentioned most often and represent the primary type of subsistence agriculture. Aside from these general land specifications, there is only mention of *noni*, ponds and land for raising *ma`o*. The *noni* and ponds are recorded in association with the *`ili* of Kamaile suggesting the claimant was claiming land in neighboring Wai`anae *Ahupua`a* in addition to the Mākaha claim. *Ma`o* refers to an introduced species of "cotton" (*Gossypium barbadense* or *Gossypium*

hirsutum) which was commercially grown in Hawai'i beginning the early part of the nineteenth century, although it never did become an important industry (Wagner *et al.*, 1990: 876). *Ma`o* generally does well in hot, arid environments and Mākaha would have been a suitable climate for such an industry. The claim was made by Abner Paki who also claimed the entire *ahupua`a* of Mākaha indicating, perhaps, his aspirations to cultivate *ma`o* as a profitable venture as well as his status in Mākaha.

Kuho`oheihei (Abner) Paki was given Mākaha *Ahupua`a* by Liliha after her husband, Boki, disappeared in 1829 (Green, 1980). Although several are recorded to have charge over Mākaha including Aua, Kanepaiki "chief of the Pearl River", and the present "King", A. Paki felt entitled to the entire *ahupua`a* of Mākaha. It is uncertain how much of his claim he was granted. Whatever the case, it is suggested Paki was able to wield a certain amount of control over the residents of Mākaha during the *Māhele* resulting in the limited number of land applications. The number of taxpaying adult males in 1855 numbered 39 indicating that there were several families living and working the Mākaha lands (J. Makalena tax records). This is not reflected in the *Māhele* documents.

Mākaha's primary settlement was inland where waters from Mākaha Stream could support *lo`i* and *kula* cultivars. Although there is evidence for settlement along the shore, for the most part, this was limited to scattered, isolated houses. The only real "cluster" of habitation structures was concentrated near Mākaha Beach or near the Kea`au end of Mākaha where there is also reference to a fishpond.

1850 - 1900

By ancient custom, the sea for a mile off the shores belonged to the *ahupua`a* as part of its resources. The ruling chief could prohibit the taking of a certain fish or he could prohibit all fishing at specific times. Paki filed two such prohibitions, one in 1852, for the taking of *he`e* or octopus (*Polypus* sp.) and the other in 1854 for the taking of *`ōpelu* (*Decapterus pinnulatus*) (Barrère in Green 1970:7).

In 1855 Chief Paki died, and the administrators of his estate sold his Mākaha lands to James Robinson and Co. Later, in 1862, one of the partners, Robert Holt, bought out the shares of the others (Ladd and Yen, 1972). The Holt family dominated the economic, land-use and social scene in Mākaha from this time until the end of the nineteenth century. During the height of the Holt family dynasty, from about 1887 to 1899, the Holt Ranch raised horses, cattle, pigs, goats and peacocks (Ladd and Yen, 1972:4). Mākaha Coffee Company also made its way into the Valley, buying up land for coffee cultivation, although they never became a prosperous industry. Upon Robert Holt's death in 1862, the lands went into trust for his children.

Early 1900's to Present

The Holt Ranch began selling off its land in the early 1900s (Ladd and Yen, 1972). In 1908, the Wai`anae Sugar Company moved into Mākaha and by 1923, all of lower Mākaha Valley was owned and operated by Wai`anae Sugar Plantation. The plantation covered most of the valleys of Lualualei, Wai`anae and Mākaha. In 1884 newspaper accounts note 7 1/2 miles of track laid which included Mākaha and in 1899 increased the length with 3 more miles of track. The manager's report for 1900 described the plantation as having some 400 acres of new

land cleared, fenced and planted, two miles of railroad and nearly three miles of flumes have been laid to said lands (Condé and Best 1973:357). For a half century Mākaha was predominantly sugarcane fields, but by 1946, the manager's report announced the plans to liquidate the property because of the additional increase in wage rates, making the operations no longer profitable (Condé and Best 1973:358).

Lack of water also undoubtedly played a role in Mākaha Valley's and Wai`anae Sugar Company's profitability. In the 1930's, Wai`anae Plantation sold out to American Factors Ltd. (Amfac, Inc.), which built a water tunnel to maintain the cultivated sugar lands. In 1946, Wai`anae Plantation announced in the *Honolulu Advertiser* (Friday, Oct 18, 1946) that it planned to liquidate its nearly 10,000 acres of land. The day before, news of the impending sale was circulated among the investors at the Honolulu Stock Exchange. One of the investors was Chinn Ho.

"The unorthodox Ho had started his Capital Investment Company only the year before with a bankroll of less than \$200,000, much of it the life savings of plantation workers. He was known as a friend of the little man, an eager disciple of economic growth, and an upstart. (McGrath *et al.* 1973:145)

He managed to broker the total deal the following day by 2 p.m. when the Wai`anae Plantation sold the Mākaha lands to the Capital Investment Corporation, which stills maintains ownership of much of Mākaha Valley. There was some attempt to convert the sugar lands back to ranching but the perennial problem of water continued. Parts of the property were sold off as beach lots, shopping centers and house lots. Many of the former plantation workers bought house lots. Chinn Ho also put his personal investment into Mākaha and initiated resort development including a luxury hotel. In 1969, the Mākaha Valley Golf Club, an 18-hole course with tennis courts, restaurant and other golf facilities was opened for local and tourist use (McGrath *et al.* 1973:146-163).

III. RESULTS OF COMMUNITY CONSULTATIONS

As partial fulfillment for the Scope of Work, consultations with agencies, Hawaiian organizations and the community-at-large were conducted to identify cultural concerns and potential cultural impacts which might be affected by the proposed Wai`anae Emergency Access Road. Initially, letters and maps indicating the proposed route were sent to key agencies and officials, Hawaiian organizations, and people in the community. In addition, a meeting was held with the State Historic Preservation Division (DLNR) Culture and History branch to discuss appropriate level of effort and any cultural concerns anticipated by the Division. Individuals had two weeks to respond to the letter. If no response was received, an attempt was made to contact individuals over the phone, if possible. Individuals contacted were asked about the following:

1. General history and land use of the "proposed road" portions of the corridor
2. Knowledge of cultural sites which may be impacted by the project, e.g., historic sites, archaeological sites, burials
3. Knowledge of traditional gathering practices in the project area – both past and present
4. Cultural associations with the project area through established traditions, legends, traditional use or otherwise
5. Referrals of knowledgeable *kūpuna* who might be willing to share their cultural expertise of the project area in general and, especially, of the "proposed road" portions of the corridor
6. Referrals of any other names of individuals who should be contacted
7. Any other cultural concerns the community might have related to Hawaiian cultural practices in or near the proposed corridor.

The following table shows the results of the community consultations which were conducted.

TABLE I: Results of Community Consultations

Key:

Affiliation

DHHL = Department of Hawaiian Home Lands
 HCC = Hawaiian Civic Club
 HMINK = Hui Mālama o Nā Kūpuna o Hawai'i Nei
 HMM = Hui Mālama o Mākuā
 OHA = Office of Hawaiian Affairs
 WCNB = Wai'anae Coast Neighborhood Board

OIBC = O`ahu Island Burial Council
 OR&L = O`ahu Railway & Land Company
 PHCA = Pu`u Haleakalā Community Association
 QLCC = Queen Lili`uokalani Children's Center
 SHPD = State Historic Preservation Division

Y = Yes

N = No

D = Declined to comment

A = Attempted (at least 3 attempts were made to contact individual, with no response)

U = unable to contact, i.e., no known phone number or forwarding address

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Abe, Fred & Hayako	Property owner	Y	N	No cultural concerns
Aila, William & Melva	HMINK, HMM	Y	Y	Inadvertent discovery of burials; Kamaile area sensitive; Helelua-Lualualei Naval Rd. segment: no specific cultural concerns
Aki, James	Former property owner			Helelua-Lualualei Naval Rd. segment: owned parcels 76 & 77 for over 30 years; no cultural concerns; never heard anything about burials or cultural sites
"Anonymous"		Y	Y	Kamaile area: concerned re: impact to cultural sites & burials due to early Hawaiian settlement in Kamaile
"Anonymous"	Resident, PHCA	Y	Y	Helelua Pl.-Lualualei Naval Road: no cultural concerns
"Anonymous"	Resident, PHCA	Y	N	Helelua Pl.-Lualualei Naval Road: no cultural concerns
"Anonymous"	Resident, PHCA	Y	N	Helelua Pl.-Lualualei Naval Road: no cultural concerns
"Anonymous"	Resident, PHCA		Y	Helelua Pl.-Lualualei Naval Road: no cultural concerns
Ayau, Halealoha	HMINK	Y	Y	-
Auwae, Rep. Emily	State Rep.	Y	Y	No specific cultural concerns; talk to <i>kupuna</i>

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Awana, Karen	WCNB #24	Y	N	No cultural concerns. Re: Nānākuli portion, not "common sense" – too close to Farrington Highway
Beu-Kaakauhemaokalani Partners	Property owner	Y		No cultural concerns
Burgess, Puanani	Wai`anae C. Comm. Devel. Corp	A	-	-
Cambra, Cassandra	Property owner	Y	N	No cultural concerns
Chua, Vincent Lopez	Property owner	Y	N	No cultural concerns
Cope, Agnes	Wai`anae Coast Culture & Arts	A	-	-
Crabbe, William D.	Property owner	Y	N	No cultural concerns
Curammeng Trust, Alfredo L.	Property owner	Y	N	No cultural concerns
Davis, Walter	Resident, PHCA	Y	Y	Helelua Pl.-Lualualei Naval Rd. segment: no specific cultural concerns
De Lude, Clarence	OIBC/ Koa Mana	Y	Y	Concerns re: possible burial disturbance; impact to cultural sites near proposed routes due to increased use of proposed road portions; cultural monitoring requested; no comments re: specific sites/burials but reserves the right to comment at a later time.
De Soto, Frenchy	President, Wai`anae Coast Archaeology Preservation Commission	Y	N	No specific cult. concerns. Nānākuli portion not practical due to flooding, water comes across road in high surf/tidal waves/storms; safety issue: too close to Hawaiian children @ Nānāikapono School.
De Soto, John	Council Member	Y	Y	Refer to Frenchy De Soto
Diamond, A. Van Horn	OIBC Chair & Kona Rep	Y	Y	Burials (non-specific)

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Enos, Eric	Ka`ala Farm, Inc	Y	Y	No specific concerns as long as emergency access uses existing roads/dirt roads, otherwise would be concerned about burials and cultural sites
Florence, Adam & Ella	Property owner	Y	N	No cultural concerns
Forina, Dennis & Mamo	WCNB #24	A	-	-
Fujii Trust, et al, George S.	Property owner	Y	N	No cultural concerns
Greenwood, Alice		Y	N	No specific cultural concerns. Doesn't know of specific burials <i>makai</i> of Farrington Highway, but the potential is always there. Cannot comment on rest of route.
Hanabusa, Senator Colleen	State Senate	Y	Y	No specific cultural concerns; burials/archaeological sites always possible, but talk to <i>kupuna</i>
Hanabusa, Ritchie	Property owner	Y	N	-
Hee, Colleen	Wai`anae Civic Club President	Y	Y	Lives on Mahina`au Rd. Heard of night marcher stories in the area but no specific details recalled
Hermann, Charles	WCNB #24	A	-	-
Hironaka, Gail	QLCC	A	-	-
Ho, Warren	Property owner of Parcel 77			Helelua Pl.- Lualualei Naval Rd.: no specific cultural concerns; never heard anything about burials or cultural sites. Lot has been bulldozed/grubbed in the past.
Hobbs, Wanda		A	-	-
Ho`ohuli Sr., Josiah (Black) & Lena	Po`o, Ka Lāhui	Y	N	Lives Nānākuli homestead. Never heard anything re: specific burials <i>ma kai</i> of Far. Hwy./along OR&L tracks, but potential is always there. No specific cult. concerns. Flooding.

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Ho'ohuli Jr., Josiah	Nānākuli Homestead	Y	N	No specific cultural concerns
Houghtailing Trust, Christopher	Property owner	Y	N	No cultural concerns
Howard, Larry	Hawn. Railway Society	Y	Y	Concerns re: OR&L
Cash-Kaeo, Mervina	Nānākuli Ahupua`a Council	Y	Y	Talk to <i>kupuna</i>
Kahananui, Pōmaika`i	Mahina`au resident	Y	N	No specific concerns. (Grew up in immediate Mahina`au area). Mentioned the springs/swimming hole pre-Board of Water Supply
Kahele, Jalna	Hawaiian Railway Soc.	Y	Y	OR&L easement
Kahikina, Mike	Hi. State House Rep.	Y	Y	No specific cult. concerns; talk to <i>kupuna</i>
Kaho`onei, Lucy M.	Property owner	Y	Y	—
Kakazu Farm Inc.	Property owner	Y	Y	—
Kamahele, Momi	`Īlio`ulao-kalani Coal.	Y	Y	Re: Nānākuli: <i>ma kai</i> of Farrington Highway not viable due to flooding; Ala Hema/Ala `Ākau segment flooded during recent July water main break; always the possibility of burials; no specific gathering or cultural use concerns
Kamana, Walter	Nānākuli Ahupua`a Council	Y	Y	Burial concerns; Unhappy with proposed <i>ma kai</i> route through Nānākuli due to flooding; need for cultural blessing; Helelua-Lualualei Naval Rd. segment: no cultural concerns, no known cultural sites
Kanahele, Kamaki	Nānākuli Homestead Assoc. Pres.	A	—	—

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Keala, Jalna	OHA Comm. Resource Coordinator	Y	Y	Referred to Native Rights Division
Keamo, Maylene	Wai`anae Ahupua`a President	Y	Y	Expressed need for WCEAR. Kamaile area: potential for burials/sites due to village being in the area. Heard of night marcher stories on Mahina`au Rd.
Keaulana, Brian		A	-	-
Keaulana, Buffalo & Momi		A	-	Spoke with Momi. Concerned re: flooding along Far. Hwy. could restrict access in/out during emergency; no specific cultural concerns;
Kila, Glen	Koa Mana	A	-	-
Kilakalua, Gabe	O`ahu Civil Defense Advisory Council	Y	Y	Nānākuli: main flood area is Haleakalā to Auyong-White Rd.; also by Coronets @ Far. Hwy.; Pōhakunui end much better since City cleaned out & rebuilt drain
Kippen, Collin	OHA-Native Rights Div.	Y	Y	Burial concerns
Kong Trustee, et al, Wing C & Beatrice T	Property owner	Y	Y	No cultural concerns
Konishi, et al, Walter S.	Property owner	Y	Y	No cultural concerns
Kuani, Jacob & Harriet	Nānākuli Homestead Assoc.	A	-	-
Lapilio, Joseph	HI. Comm. Services Council	A	-	-
Armitage-Lapilio, Nettie	Wai`anae Coast Coalition	A	-	-
Lau Trust, Lindbergh	Property owner	Y	N	No cultural concerns
Ligsay Trust, Soledad	Property owner	Y	N	No cultural concerns

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Lindsey, Doreen	President, Nānāika-pono Hawaiian Civic Club	Y	Y	No specific cultural concerns. Doesn't really know about <i>ma kai</i> side of Far. Hwy.
Liu, Peter & Eleanor	Property owner	Y	N	No cultural concerns
Logan, Denny	President, PCHA	A	A	-
Logan, Phyllis	Manager, PCHA	Y	Y	Helelua Pl.-Lualualei Naval Rd.: no specific cultural concerns
Lone Star Hawai'i	Property owner	Y	N	No cultural concerns
Mc Eldowney, Holly	SHPD, Culture & History	Y	Y	Burial/cultural layer concerns; OR&L concerns; prefers finding alternative route through Nānākuli;
Markell, Ka'iana	SHPD Burials Dir.	Y	Y	See Van Diamond
Napoka, Nathan	SHPD, History & Culture Branch Chief	Y	Y	Burial/cultural layer concerns; OR&L concerns; flooding during storms/high surf; taking away from school; safety issue - school children; prefers finding alternative route through Nānākuli; Helelua Pl.-Lualualei Naval Rd. segment: no specific cultural concerns
Ocalaray, et al, Santiago	Property owner	Y	N	-
Ogata, Carol	SHPD	Y	N	OR&L easement: consult with SHPD re: OR&L prior to road work beginning
Ornellas, Danny	DHHL/Planning Dept.	Y	N	"No Comment". Asked re: impact to families camping/parking
Ornellas, Landis		Y	N	Kamaile area: sensitive; Helelua Pl.-Lualualei Naval Rd.: no specific cultural concerns
Oshiro Trust, et al, Seiko	Property owner	Y	N	No cultural concerns
PH Property Development Co.	Property	Y	N	No cultural concerns

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Patterson, Rev. Kaleo	Property owner	A	-	-
Pelekai, Pikake	OIBC-Wai'anae	A	-	-
Queen Lili'uokalani Children's Center	Gail Hironaka	A	-	-
RNI Ltd., Partners	Property owner	Y	N	-
Rezentes, Cynthia	WCNB #24	Y	Y	Nānākuli: unexploded ordinance from WWII; archaeological concerns re: burials/cultural layers; known flood area; Helelua Pl.-Lualualei Naval Road segment: no specific cultural concerns
Rodrigues, Danny	WCNB #24	Y	Y	Nānākuli: Burials/cultural layer/flooding; Helelua Pl.-Lualualei Naval Rd.: no cultural concerns
Saito, Steven & Stephanie	Property owner	Y	Y	No cultural concerns
Saito Trust, et al, Takato	Property owner	Y	N	No cultural concerns
Saki, Minoru & Merlin	Property owner	Y	N	No cultural concerns
Salcedo Family Ltd., Partnership	Property owner	Y	N	No cultural concerns
Sato, Andrew	representing owner of Parcel 76			Helelua Pl.-Lualualei Naval Rd.: no specific cultural concerns;
Savio Enterprises, Inc.	Property owner	Y	N	No cultural concerns
Schlapak, Ben	Hawaiian Railway Soc.	Y	N	Nānākuli: OR&L concerns; what about bike path? Movement of sand/erosion during storms
Schuler Homes, Inc.	Property owner	Y	N	No cultural concerns
Shige International, Inc.	Property owner	Y	N	No cultural concerns
Silva, Alike	Koa Mana	Y	Y	Burial concerns; Kamaile section: cultural site concerns; cultural monitoring

Name	Affiliation	Contacted (Y/N/A)	Referral(s)	Comments
Soon, Raynard	DHHL	Y	Y	Referred to DHHL Planning Dept.
Supnet Trust, Albert & Caridad	Property owner	Y	N	No cultural concerns
Tanaka Trust, Jonelle	Property owner	Y	N	No cultural concerns
Tavares, et al, Wayne	Property owner	Y	N	No cultural concerns
Teruya, Patty	WCNB #24	A	-	-
Tomita, et al, Rusty	Property owner	Y	N	No cultural concerns
Waller, Betty	Makaha Ahupua`a Assoc.	Y	Y	No specific cultural concerns
White, John	Property owner	Y	N	No cultural concerns
Wu-Wai`anae, Inc.	Property owner	Y	N	No cultural concerns
Yoshio, et al, Honda & Grace	Property owner	Y	N	No cultural concerns

TABLE II: COMMUNITY CONCERNS (See discussion below)

Segment: Street Name	Primary Cultural Concerns	Secondary Concerns (not necessarily cultural)
<p>Nānākuli: Farrington Hwy. segment between Pōhaku Nui Rd. and Lualualei Naval Road and <i>ma kai</i> of the OR&L railroad tracks fronting Nānāikapono School, Nānākuli Beach Park and a portion of Ulehawa Beach Park (Figure 6)</p>	<p>1) Potential of disturbing burials/<i>iwi kūpuna</i>, especially near Haleakalā Ave.; 2) proximity to sand berm which contains burials/cultural layers; 3) preference is to not cut into the sand berm at all; 4) cultural monitor requested; 5) impact to O`ahu Railway & Land (OR&L) Company Right-of-Way (Site 80-12-9714); 6) infringing on children’s space @ Nānāikapono School, as well as proximity to school.</p>	<p>1) Known flood area during storms, tidal waves, high surf; 2) Access in/out may not be possible if an emergency arose during times the area is flooded due to water, sand, debris; 3) Safety issue: possibility of WW II unexploded ordinance; 4) Safety issue: at certain bus stop areas, riders step out into the highway to avoid the water; 4) Waste of taxpayer dollars if rock wall fronting Nānākuli Beach Park and Ulehawa Beach Park needs to be relocated/pushed back to make room for wider road; 5) Not practical due to limited space & proximity to Farrington Highway</p>
<p>Lualualei: Helelua Pl.– Lualualei Naval Rd. (Figure 2)</p>	<p>None noted.</p>	<p>None noted.</p>
<p>Lualualei: Pa`akea Rd. (Figure 7)</p>	<p>1) Potential of disturbing burials/<i>iwi kūpuna</i>; 2) cultural monitor requested</p>	<p>Impact to “existing sites” which would not be directly impacted by road construction but might be impacted due to increased usage/traffic in the area & people pulling off along the road, stopping to hike or look around along side the road</p>
<p>Lualualei: Mā`ili Kai/Kaukama Rd. (Figure 7)</p>	<p>1) Potential of disturbing burials/<i>iwi kūpuna</i>; 2) cultural monitor requested</p>	<p>Impact to “existing sites” which would not be directly impacted by road construction but might be impacted due to increased usage/traffic in the road & stopping to hike or look around along side the road</p>
<p>Wai`anae: Ala Hema-Ala `Ākau (Figure 8)</p>	<p>1) Potential of disturbing burials/<i>iwi kūpuna</i>; 2) potential of sink hole burial sites; 3) cultural monitor requested</p>	
<p>Wai`anae: Kamaile Elem. School (Figure 8)</p>	<p>1) Potential of disturbing burials/<i>iwi kūpuna</i>; 2) potential of sink hole burial sites; 3) cultural monitor requested</p>	
<p>Wai`anae: Mahina`au Rd. (Figure 8)</p>	<p>1) Potential of disturbing burials/<i>iwi kūpuna</i>; 2) night marchers’ path 3) necessity of having a Hawaiian blessing prior to start-up of construction on WCEAR– especially this portion; 4) cultural monitor requested</p>	

Segment: Street Name	Primary Cultural Concerns	Secondary Concerns (not necessarily cultural)
Wai`anae: Kaulawaha Rd. (Figure 8)	1) Potential of disturbing burials/ <i>iwi kūpuna</i> ; 2) proximity to Kāne i ka Pualena <i>heiau</i> site and Pu`u Kamaile; 3) conduct blessing @ Kāne i ka Pualena <i>heiau</i> site; 4) cultural monitor requested	Impact to “existing sites” which would not be directly impacted by road construction but might be impacted due to increased usage/traffic on the road
Makaha: Kaulawaha Rd. (Figure 8)	1) Potential of disturbing burials/ <i>iwi kūpuna</i> ; 2) cultural monitor requested	

Discussion of Concerns Raised During Consultation

A. Burials

Hawaiians traditionally practiced various interment methods such as burying in sand and in sink holes. Hawaiians commonly buried their dead in sand near the coast and it is not unusual to find burials in unconsolidated sand deposits. Sand burials were a very common method of interment practiced by Hawaiians (Cleghorn 1987:42). One of the earliest references to burial practices was made by Urey Lisiansky, who visited Hawai`i in June, 1804. He noted: “The poor are buried anywhere along the beach. . .” (1814:122). According to Bowen (1961:21), most Hawaiians in the precontact period belonged to the *maka`āinana* or commoner class and their bones were usually buried in no other area than their particular `ili (land division within an *ahupua`a*). He goes on to say that graves were “. . . either simply pits dug in the earth, or large enclosures . . . Occasionally they buried their dead in sequestered places at a short distance from their habitations, but frequently in their gardens and sometimes in their houses. Their graves were not deep and the bodies were usually placed in them in a sitting posture” (Bowen 1961:142). Likewise, burials in limestone sink features is another fairly common Hawaiian mortuary practice that has been documented extensively on O`ahu at Kalaeloa (Barber’s Point) and the adjacent West Beach area.

Concerns regarding potential impact to burials throughout the entire proposed road segments of the WCEAR was the number one issue raised during consultation with the community. However, several segments were considered to be of relatively higher concern than other segments due to a greater potential for containing burials. The area considered most sensitive is the proposed Nānākuli segment which runs parallel to Farrington Highway on the *ma kai* side of the O`ahu Railway and Land (OR&L) Company’s railroad tracks. Sensitivity in this portion was rated high due to proximity to the adjacent sand berm and the coast, as well as the railroad tracks. Sand dunes are known to often contain burials and cultural layers. In particular, Mr. Alike Silva, *kahu kulaiwi* for the Poe `ohana, had specific knowledge of *iwi* (bones) being exposed during stormy seasons or hurricanes where *iwi* were washed onto Farrington Highway. Mr. Silva also helped to reinter “many *iwi*” back in the sand dune, on both the *ma uka* and *ma kai* sides of the beach wall that parallels the OR&L tracks, as well as within the project corridor between the OR&L tracks and the beach wall. The depth of the reinterred burials was considered confidential information by Mr. Silva and was not disclosed.

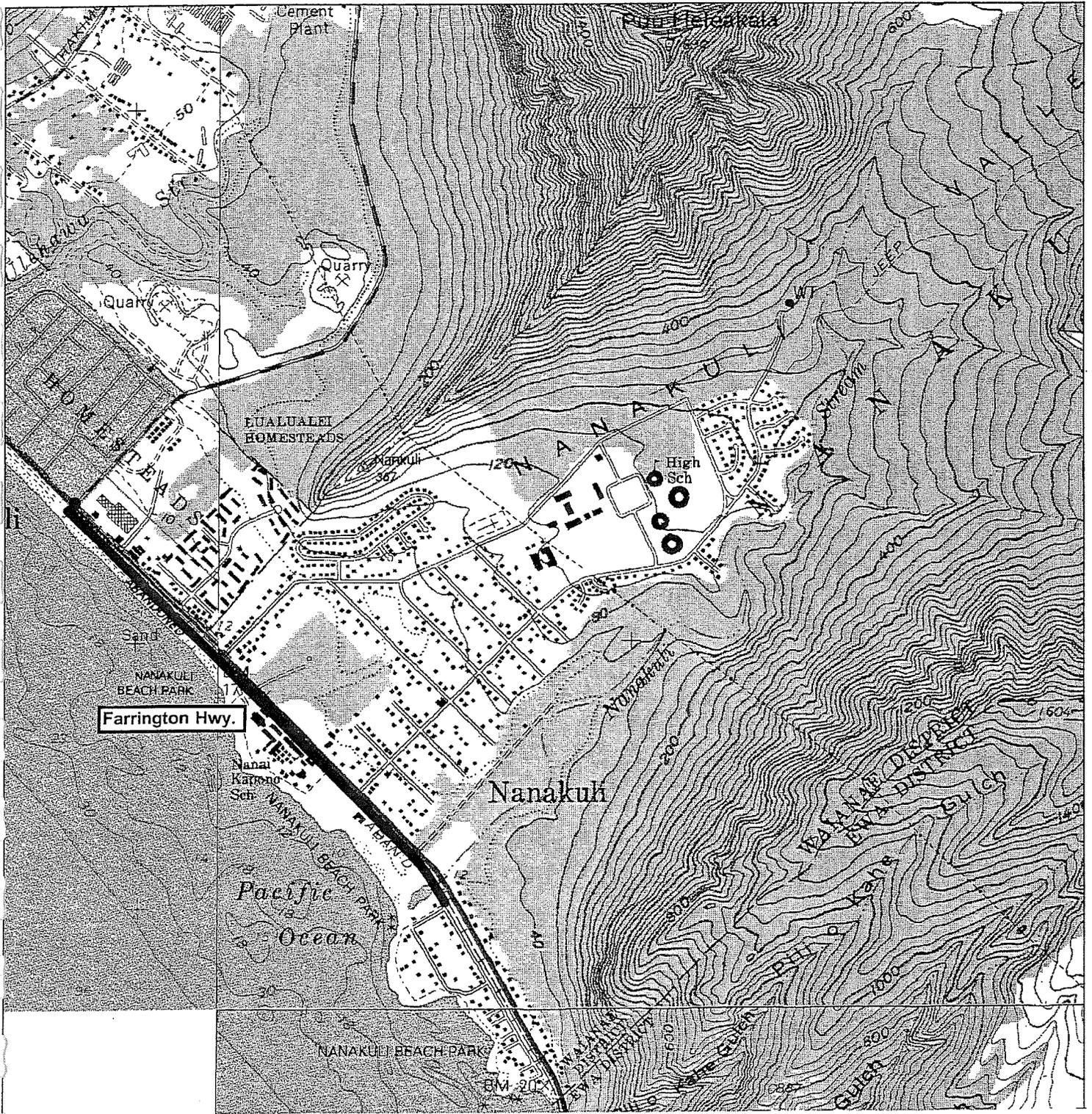
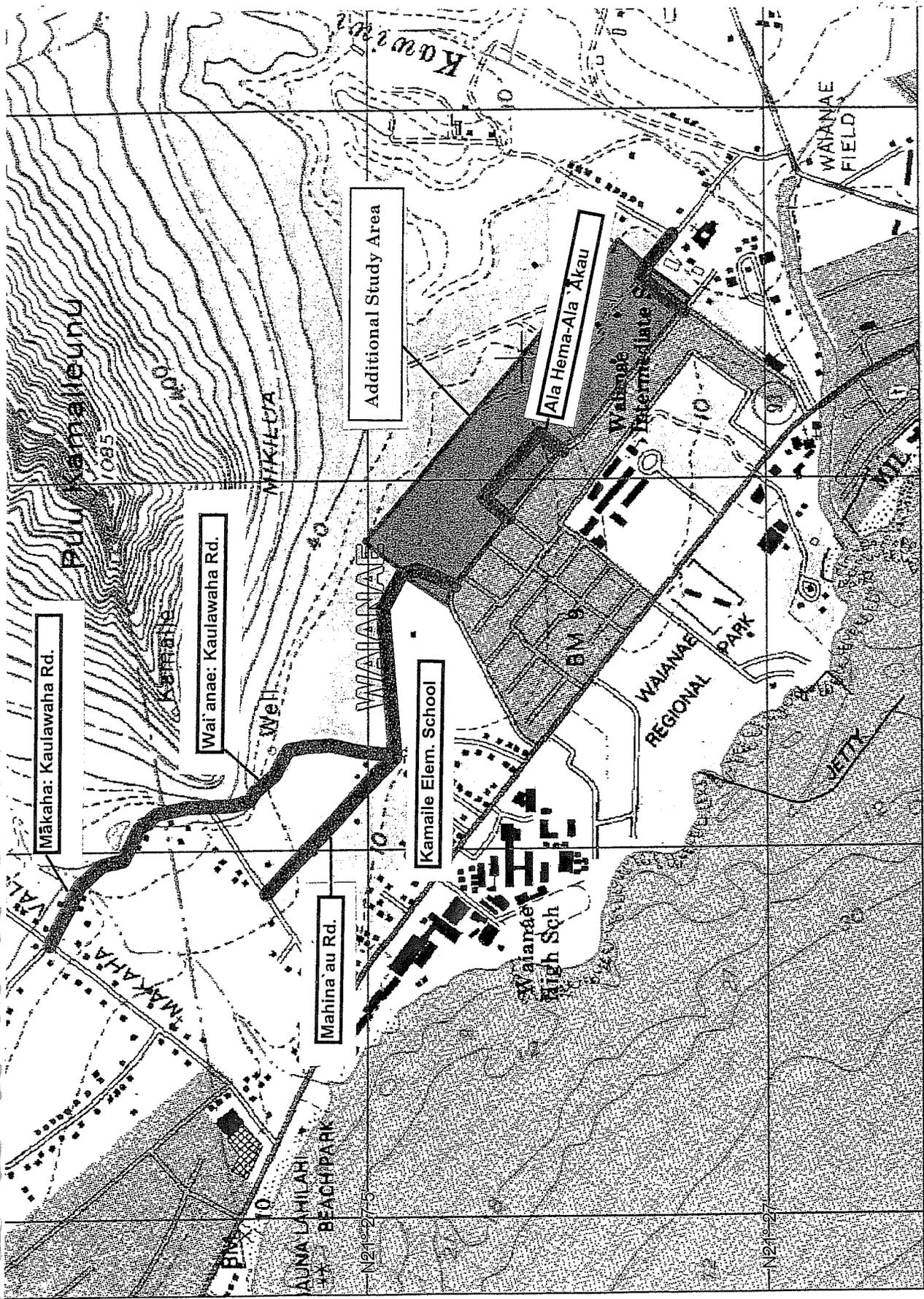


Figure 6 Map showing the Nānākuli portion of the proposed Wai'anae Coast Emergency Access Road



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 500 ft. Scale: 1:12,800 Detail: 1:3,200 Datum: WGS84

Figure 8 Map showing the Wai'anae/Mākaha portions of the proposed Wai'anae Coast Emergency Access Road: Ala Hema St. to Ala 'Ākau St., Kamaile Elementary School, Mahina'au Rd. and Kaulawaha Rd.

The community expressed concern about whether this particular portion of the route would be widened to a two-lane road, which might mean disturbing the sand berm. Of particular concern to one *kupuna* is the area near Haleakalā Avenue and Farrington Highway, which he considers to pose a higher risk for burial disturbance. Another cultural consultant indicated the high risk area extends beyond Haleakalā Avenue to Hakimo Road along Farrington Highway. The importance of having a cultural monitor on the project team once the construction of the road work begins was requested by several cultural consultants.

One cultural consultant indicated the “proposed road” segments from Ala Hema St. to Kaulawaha at Mākaha Valley Road contained a higher potential for encountering burials. He also indicated that, to his knowledge, much of the Ala Hema St. to the Kamaile portion is underlying coral reef. He indicated this area had many sinkholes and the presence of burials were a real possibility. He also noted that even though there appears to be a layer of dirt on the surface, a sinkhole could be just under the surface layer.

Yet, another cultural concern was not only the proximity of the WCEAR to Nānāikapono School whose enrollment is comprised of predominantly Hawaiian children, but the idea that the school might lose needed space in order to accommodate the emergency road.

The following secondary issues for the Nānākuli/Farrington Highway segment were raised in addition to the above. Though these issues are not cultural, these do involve safety issues and, perhaps, need to be heard and considered by the planners of this project. This portion of Nānākuli is a known flood area during storms, tidal waves and high surf. Sand and debris are often washed over onto Farrington Highway when the area floods due to hazardous ocean conditions. It was mentioned that recently the City and County cleaned out and rebuilt the storm drain which had become blocked with debris and sand over the years. However, the area between Haleakalā Avenue and Auyong-White Road is especially prone to flooding during times of high surf (Personal Comm., Gabe Kilakalua 7/27/01). Questions were raised whether an emergency route through this portion would really be feasible during times of flooding such as mentioned above. A second safety issue is that of finding unexploded ordinance – remnants of WWII activity on the Wai`anae Coast. During WWII, the beaches along the Wai`anae Coast, including Nānākuli, were heavily utilized by the military. Previously, an unexploded ordinance from WWII was found in the yard of a Nānākuli resident who lived *ma kai* of the OR&L railroad tracks (Personal Communication, Cynthia Rezentes, 8/20/01).

Many residents did not understand the practicality of placing the WCEAR in an area which is already congested and prone to flooding. Upcoming projects, such as the Leeward bike path also need to be taken into consideration. Some residents felt it would be unwise use of taxpayer dollars should the stone wall be relocated further *ma kai* to make room for the emergency access route.

B. Other Archaeological Concerns

In relation to the Pa`akea Road, Kaukama Road and Wai`anae/Kaulawaha Road segments, an indirect potential impact of the WCEAR is that increased usage of these areas could impact existing sites in the vicinity of the proposed road corridors. The exact locations and identities of the sites were not disclosed due to confidentiality and the desire to protect these sites. Several cultural consultants were concerned that these areas would be more readily accessible to the general public. Drivers might be tempted to pull over or stop along the

road to investigate and look for cultural artifacts, burial caves, etc. Concern was expressed that these particular “proposed road” segments be locked and gated when not being used for emergency purposes.

C. Religious Sites

Two cultural specialists indicated that near the base of Pu`u Kamaile [noted on maps as Pu`u Kamaile`unu] is the location of the *heiau*, Kāne i ka Pualena (Site 160). This *heiau* is said to be associated with Kawelo. At the time of McAllister’s survey in 1930, he noted that the “approximate location in the cane was pointed out, but all the stones have been removed” (1933:114). In particular, one cultural consultant shared that the location of Kāne i ka Pualena was shown to him by his great grand-uncle and that this *heiau* was considered “very special” to his family who has genealogical ties to the area. Even though the stones have been removed, this person indicated the original foundation might still be present and could be utilized should someone wish to rebuild the site in the future. The same cultural consultants expressed concern that, as marked, this portion of the proposed road would destroy a small part of the *pu`u*. Both persons requested the reconfiguring of a small portion of this segment so that the road skirts around the bottom of the *pu`u*, so as not to encroach on the *pu`u* directly and to be a short distance away from the *pu`u* as a matter of respect to the *heiau*.

D. Hawaiian Trails

The present Farrington Highway follows the coastal trail mentioned by John Papa `Īī. Specific concerns regarding access *ma uka* or *ma kai* were a non-issue.

Though several people mentioned a night marcher’s trail through Mahina`au Road, no one could give specific details on the trail or its exact location (See “Other Concerns” below). A *kūpuna*, who supposedly knew more about the trail recently passed away. Her children indicated they had heard about the trail from their mother, but they could not relate any specific details about it. It is possible that other *kūpuna* in the Wai`anae District know more about this trail, however, none were identified in this cultural assessment.

There are traditional Hawaiian beliefs regarding the *huaka`i pō* or the tradition of night marchers. According to tradition, the night marchers are the souls of those who have passed on and are no longer here in physical body. An `ōlelo no`eau (proverb) makes reference to this tradition: “*He pō Kāne kēia, he mā`au nei nā`e`epa o ka pō*. This is the night of Kāne, for supernatural beings are wandering about in the night” (Pukui 1983:98; O.N. #908). Following the lunar calendar, on certain nights, (the nights of the gods – Kū, Akua, Lono, Kāne and Kāloa), the procession of ghosts can be seen and heard as they travel to familiar places they once frequented while here on this earth. “They used to march and play games practically on the same ground as in life. Hence each island and each district had its own parade and playground along which the dead would march and at which they would assemble” (Beckwith 1978:200). Sometimes, the sound of drums and chanting can be heard, their *kukui* torches seen, and the sounds of laughter and talking heard. It is said that the *huaka`i pō* usually takes place after the sun sets and ends before dawn breaks. The path usually follows a particular route, sometimes connected to a *heiau*, a fishpond, or a specific cultural site. Most often, the path or route of the night marchers travels *ma uka* to *ma kai* after the sun sets and returns from *ma kai* to *ma uka* before dawn. Another cultural belief which is part of the night marcher tradition is that, when encountered, one should stay out of their path and one should never look

directly at them as they pass by. To do so will bring harm and/or death to the onlooker. To save oneself, one might also call out to an ancestor or *`aumakua* in the hopes that he/she will recognize you as *`ohana* (a relative) and spare your life. For some, the tradition may also include prostration and removal of clothing as a sign of respect and a means to pacify the night marchers.

Concerning the Helelua Pl. - Lualualei Naval Rd. segment, modern foot trails can be seen through Parcels 76 and 77 leading to the Pu`u Haleakalā community and the remnant group of homes from Nakatani Housing near Lualualei Naval Road. The neighboring residents and youth use the trails through the parcels as a short-cut to get to and from the Sack-n-Save shopping center and the bus stop on Farrington Highway to their homes nearby.

E. Native Hunting Practices

No concerns were raised.

F. Native Gathering Practices for Plant Resources

No concerns were raised in relation to gathering rights and practices.

G. Fishing/Marine Resources

The coastal area is utilized for gathering for subsistence and cultural uses, however, no concerns were raised as access to the beaches was not an issue.

H. Historic Sites

In 1975, the O. R. & L. Railroad Right of Way was put on the National/Hawai`i Register of Historic Places. Also designated as State Site 50-80-12-9714, the right of way was considered significant for the following reasons:

1. Material Significance: The Nānākuli-Honouliuli right-of-way is the longest stretch of continuous railroad track in Hawai`i. It is also one of the longest stretches of narrow-gauge railroad track in place in the United States.
2. Historic Significance: The Nānākuli-Honouliuli right-of-way is the longest remaining continuous stretch of the historic O`ahu Railway and Land Company narrow-gauge railroad in existence.

It is a well-preserved remnant of the earlier 175 miles of track laid by this railroad that had a tremendous effect on the economic development of O`ahu and the State of Hawai`i.

Specific concerns regarding the OR&L right-of-way were raised by several members of the Board of Directors for the Hawaiian Railway Society who maintain the right-of-way and the tracks. The right-of-way easement is a total of 40 ft. wide, in other words 20 ft. on each side of the tracks. A 10 ft. buffer from the edge of the ties on each side must be maintained at all times. When crossing over the tracks, designated crossing points must be used so that the tracks do not get out of line. During any construction or road work, the tracks must be kept

clean (e.g., no piling of dirt or debris on tracks). Because the easement is on the National Register of Historic Places, Federal rules would apply. One board member indicated the 40 ft. easement could not be encroached upon at all, while two other board members were uncertain as to application of the Federal rules and whether some agreement with the City and County would be permissible. Coordination with the Hawaiian Railway Society and the DLNR/State Historic Preservation would be necessary prior to start-up of any road work or construction along the proposed Nānākuli segment as it stands now.

I. Other Concerns

Residents raised the concern that proper spiritual protocol be observed and implemented prior to the beginning of any construction on the WCEAR. Several residents requested the following: (1) an opening blessing ceremony to bless the overall project; (2) a separate blessing at the location of Kāne i ka Pualena *heiau* to ask permission from the *`uhane* (spirits) of that place for the road to be there; and (3) a separate blessing at the location of Mahina`au Road to bless and cleanse Mahina`au Road and ask the *`uhane/kūpuna* not to *hana`ino* (cause injury) anyone and to allow the access road to be there.

J. Additional segment: Helelua Pl. - Lualualei Naval Road

There were no cultural issues or concerns raised for this additional roadway segment due to the conditions of the project area – sparse vegetation, the terrain consisting of predominantly coral limestone, and being graded and grubbed more than once in the past.

IV. SUMMARY AND RECOMMENDATIONS

A. Summary

The thrust of this cultural assessment was consultation, identification of cultural concerns in relation to traditional Hawaiian cultural practices and gathering rights, and lastly, recommendations.

After key agencies, Hawaiian organizations, and residents from the Wai‘anae Coast were identified, initial letters and maps were mailed explaining the project and asking for input and comments regarding cultural concerns as it pertained to traditional Hawaiian cultural practices along the “proposed road portions” of the WCEAR. Following a two-week waiting period, the letters were followed up with phone calls and visits to residents in the community. While ethnographic interviewing was not part of the scope of work for this project, the consultation process did involve lots of talk-story with concerned residents. All comments were documented and field notes were maintained.

As a result of the consultation process, the following primary concerns were identified: (1) potential of disturbing burials/*iwi kūpuna* along all portions of the route, with the Nānākuli/Farrington Highway segment – from the end of Pōhaku Nui Road to Lualualei Naval Road and *ma kai* of the OR&L Railroad tracks fronting Nānāikapono School, Nānākuli Beach Park and a portion of Ulehawa Beach Park - and the Ala Hema/Ala ‘Ākau Street to Kaulawaha Street at Mākaha Valley Road segments being the most sensitive; (2) impact to Pu‘u Kamaile and Kāne I ka Pualena *heiau* site; (3) a night marchers’ path on Mahina‘au Road; (4) the importance of spiritual protocol/opening blessing for the project, as well as a blessing at Kāne I ka Pualena *heiau* site and at Mahina‘au Road; (5) cultural monitoring of the project when improvements to the WCEAR begins; (6) potential impact to the O.R. & L. Railroad, which is on the National Register of Historic Places, was raised by the Hawaiian Railway Society and the DLNR/State Historic Preservation Division. There is a concern that, along certain portions of the proposed route, existing sites will be indirectly impacted through increased traffic in the vicinity, but not necessarily impacted by the WCEAR directly.

Though not cultural concerns, several safety issues were raised. These secondary concerns are 1) known flooding along Farrington Highway, especially between Haleakalā Avenue and Auyong-White Road; 2) unexploded ordnance from WWII; 3) proximity of the route to young school children at Nānāikapono School; 4) very “tight” space in an already congested area *ma kai* of the O.R. & L. railroad tracks.

It should be noted that this assessment was carried out in two phases. The original Nānākuli alignment ran *ma kai* of Farrington Highway and parallel to the railroad tracks from Laumania Avenue to Lualualei Naval Road. Due to cultural concerns raised during the first phase by the community, the Department of Land and Natural Resources/State Historic Preservation Department and the Hawaiian Railway Society, a portion of the original Nānākuli alignment from Nānākuli Avenue to Lualualei Naval Road was rerouted *ma uka* of Farrington Highway to minimize impacts to the *ma kai* area. The *ma uka* route uses existing streets including Nānākuli Avenue, Mano Avenue, Haleakalā Avenue, Helelua Street and Helelua Place together with the Helelua Place extension to Lualualei Naval Road to bypass Farrington Highway. The second phase of this study assessed the proposed alignment from Helelua Place to Lualualei Naval Road. No cultural concerns or issues were raised for this additional roadway segment.

B. Recommendations

Based on input from the community during the consultation period, the following recommendations are suggested as a way to mitigate community issues and concerns which were raised.

1. The Wai‘anae Coast community is very sensitive to the potential of burial disturbance and appropriate handling and disposition of burials. For this reason, several residents have requested cultural monitoring for all phases of the project, with heightened concerns for the Nānākuli/Farrington Highway segment - from the end of Pōhaku Nui Road to Lualualei Naval Road and *ma kai* of the OR&L railroad tracks fronting Nānāikapono School, Nānākuli Beach Park and a portion of Ulehawa Beach Park – and the Ala Hema/Ala ‘Ākau to Kaulawaha segment in Mākaha.
2. Relocate *ma kai* the Kaulawaha portion of the road at the base of Pu‘u Kamaile by at least 20 ft. so as not to disturb the *pu‘u* and to maintain a respectful distance from the Kāne I ka Pualena *heiau* site.
3. Conduct a spiritual blessing prior to beginning the project, as well as bless/cleanse Mahina‘au Road due to the presence of night marchers, and bless the Kāne I ka Pualena *heiau* site.
4. Based on consultations with the DLNR/State Historic Preservation Division and the Hawaiian Railway Society, reconsider and search for an alternative for the segment in Nanakuli *ma kai* of Farrington Highway that would have less potential impact to burials and the O.R. & L. Railroad right-of-way, which is on the National/Hawaii Register of Historic Places. As part of the second phase of this assessment this has already been mitigated by rerouting a portion of the proposed emergency access road alignment from Nānākuli Avenue to Lualualei Naval Road on the *ma uka* side of Farrington Highway.
5. Any work conducted nearby or within the O.R. & L. Railroad right-of-way should be coordinated with the DLNR/State Historic Preservation Division and the Hawaiian Railroad Society prior to work beginning.

V. REFERENCES

- Barrère , Dorothy in Roger C. Green, Editor
1980 *Mākaha Before A.D. 1880*. Mākaha Valley Historical Project Summary Report No. 5. Pacific Anthropological Records, Number 31. Honolulu, HI: Department of Anthropology, Bernice P. Bishop Museum.
- Barrère , Dorothy in Roger C. Green, Editor
1970 *Mākaha Valley Historical Project*. Interim Report No. 2. Pacific Anthropological Records, Number 10. Honolulu, Hawai'i: Department of Anthropology, Bernice P. Bishop Museum.
- Beckwith, Martha (Edited by)
1978 *Kepelino's Traditions of Hawai'i*. Bernice P. Bishop Museum Bulletin 95. Millwood, N.Y.: Kraus Reprint Co.
- Bowen, Robert N.
1961 *Hawaiian Disposal of the Dead*. M.A. thesis submitted to the Graduate School of the University of Hawai'i.
- Bowser, George
1880 *The Hawaiian Kingdom: Statistical and Commercial Directory and Tourist Guide, 1880-1881*. Honolulu and San Francisco: G. Bowser & Co.
- Chinen, Jon J.
1958 *The Great Māhele Hawai'i's Land Division of 1848*. Honolulu: University of Hawai'i Press.
- Cleghorn, June Noelani Johnson
1987 *Hawaiian Burial Reconsidered: An Archaeological Analysis*. M.A. Thesis submitted to the University of Hawai'i Anthropology Department.
- Commissioner of Public Lands
1929 *Indices of Awards Made by the Board of Commissioners to Quiet Land Titles in the Hawaiian Islands. Alphabetical Index of Awards By Land*. Honolulu: Star-Bulletin Press.
- Ibid* Land Commission Native Register.
- Conde, Jesse C. and Gerald M. Best
1973 *Sugar Trains, Narrow Gauge Rails of Hawai'i*. Felton, CA: Glenwood Publishers.
- Cordy, Ross
1998 *Ka Moku o Wai`anae: He Mo`olelo o ka Wā Kahiko*. State of Hawai'i, Honolulu, HI: State Historic Preservation Division.
- Coulter, John Wesley, Ph.D.
1935 *A Gazetteer of the Territory of Hawai'i*. Honolulu: University of Hawai'i.

Department of the Interior

1902 *Interior Department Records*. 6 October, Boyd to Dole. Honolulu:
Department of the Interior.

Department of Land and Natural Resources

1845-1903 *Liber*. (Land Record Books). Territory of Hawai'i: Commissioner of Public
Lands.

Dung, Albert *in* Allan Schilz

1994 *Preliminary Draft: 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*. A report prepared
by Ogden Environmental & Energy Services Co., Honolulu, Hawai`i.

Ellis, William

1974 *Polynesian Researches: Hawai`i*. Rutland, Vermont and Tokyo, Japan:
Charles E. Tuttle Company.

Emerson, Nathaniel B.

1993 *Pele and Hi`iaka A Myth From Hawai`i*. Honolulu, Hawai`i: `Ai Pōhaku
Press.

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

1972 *Soil Survey of the Islands of Kaua`i, O`ahu, Maui, Molokai and Lāna`i,
State of Hawai`i*. Washington, D.C.: U.S. Government Printing Office.

Green, Roger C. (Editor)

1980 *Mākaha Before A.D. 1880*. Mākaha Valley Historical Project Summary Report
No. 5. Pacific Anthropological Records, Number 31. Honolulu, HI: Department
of Anthropology, Bernice P. Bishop Museum.

Green, Rober C. (Editor)

1970 *Mākaha Valley Historical Project*. Interim Report No. 2. Pacific Anthropological
Records, Number 10. Honolulu, Hawai`i: Department of Anthropology, Bernice
P. Bishop Museum.

Handy, E. S. Craighill

1940 *The Hawaiian Planter*. Volume 1. Bishop Museum Bulletin No. 161. Honolulu,
Hawai`i: B.P. Bishop Museum originally in 1940; Kraus Reprint, Millwood, N.Y.

Handy, E. S. Craighill and Elizabeth Green Handy

1972 *Native Planters in Old Hawai`i Their Life, Lore, and Environment*. Honolulu,
Hawai`i: Bishop Museum Press.

Hawai` State Archives

[No date] Manuscript Collection, M-445, #8: *Place Name Chants*. Henry E. P. Kekahuna
notes.

Hawai'i State Archives

[No date] Manuscript Collection, M-86, Box 19, #494: *Island of O`ahu*. Theodore Kelsey notes.

Hawai'i State Archives

1855 *ʻEwa and Wai`anae Tax Assessment Book*. J.W. Makalena tax records.

Īī, John Papa

1983 *Fragments of Hawaiian History*. Bernice P. Bishop Museum Special Publication 70. Honolulu, Hawai'i: Bishop Museum Press.

James, Van

1991 *Ancient Sites of O`ahu*. Honolulu: Bishop Museum Press.

Judd, Henry P.

1930 *Hawaiian Proverbs and Riddles*. Bernice P. Bishop Museum Bulletin 77. Honolulu, Hawai'i: Bernice P. Bishop Museum.

Juvik, sonia P. and James O. Juvik, Eds.

1998 *Atlas of Hawai'i*. Third Edition. Department of Geography, University of Hawai'i at Hilo. Honolulu: University of Hawai'i Press.

Kamakau, Samuel M.

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

Kamakau, Samuel Mānaiakalani

1991 *Tales and Traditions of the People of Old (Nā Mo`olelo a ka Po`e Kahiko)*. Honolulu: Bishop Museum Press.

Kelly, Marion in Alan E. Haun

1991 *An Archaeological Survey of the Naval Magazine and Naval Communications Area Transmission Facility, Lualualei, O`ahu, Hawai'i*. A report prepared by Public Archaeology Section, Applied Research Group, Bishop Museum, Honolulu, Hawai'i.

Krauss, Beatrice H.

1993 *Plants in Hawaiian Culture*. Honolulu: University of Hawai'i Press.

Kuykendall, Ralph and A. Grove Day

1961 *Hawai'i: A History From Polynesian Kingdom to American State*. (Revised Edition) Englewood Cliffs, N.J.: Prentice-Hall, Inc.

Kuykendall, Ralph S.

1938 *The Hawaiian Kingdom*. Honolulu: The University Press of Hawai'i.

- Ladd, Edmund J. and D. E. Yen (Editors)
 1972 *Mākaha Valley Historical Project*. Interim Report No. 3. Pacific Anthropological Records Number 18. Honolulu, HI: Bernice P. Bishop Museum.
- Lisiansky, Urey
 1814 *A Voyage Round the World in the Years 1803, 1804, 1805, and 1806 . . . in the Ship Neva*. London: Longmans.
- McAllister,
 1933 *Archaeology of O`ahu*. Bernice P. Bishop Museum Bulletin 104. Honolulu: Bernice P. Bishop Museum.
- Mc Grath, Edward J., Kenneth M. Brewer & Bob Krauss
 1973 *Historic Wai`anae, A Place of Kings*. Norfolk Island, Australia: Island Heritage Limited.
- Mc Guire, Ka`ohulani and Hallett H. Hammatt
 2000 *A Traditional Practices Assessment for the Proposed Nānākuli IV Elementary School Site, Nānākuli, Wai`anae District, Island of O`ahu (TMK: 8-9-02: 65, 23, por 1)*. A report prepared for Wilson Okamoto & Associates, Inc. by Cultural Surveys Hawai`i.
- Neal, Marie C.
 1965 *In Gardens of Hawai`i*. Honolulu: Bernice Pauahi Bishop Museum.
- Pukui, Mary Kawena and Samuel H. Elbert
 1986 *Hawaiian Dictionary*. Revised and enlarged edition. Honolulu: University of Hawai`i Press.
- Pukui, Mary Kawena and Samuel H. Elbert
 1957 *Hawaiian Dictionary*. Honolulu: University of Hawai`i Press.
- Pukui, Mary Kawena
 1983 *ʻŌlelo No`eau Hawaiian Proverbs & Poetical Sayings*. Honolulu, Hawai`i: Bishop Museum Press.
- Pukui, Mary Kawena, Samuel H. Elbert and Esther T. Mo`okini
 1976 *Place Names of Hawai`i*. (Revised and Enlarged Edition) Honolulu: University of Hawai`i Press.
- Schmitt, Robert C.
 1973 *The Missionary Censuses of Hawai`i*. Pacific Anthropological Records No. 20. Department of Anthropology. Honolulu, Hawai`i: Bernice Pauahi Bishop Museum.
- Sterling, Elspeth P. and Catherine C. Summers
 1978 *Sites of O`ahu*. Revised Edition. Honolulu: Bishop Museum Press.

Wagner, Warren L., Derral R. Herbst and S.H. Sohmer
1990 *Manual of the Flowering Plants of Hawai'i*. Vol. 1 and 2. Honolulu: University
of Hawai'i Press and Bishop Museum Press.

Vancouver, George
1798 *A Voyage of Discovery to the North Pacific Ocean and Round the World; in Which
the Coast of the North-West America Has Been Carefully Examined and
Accurately Surveyed*. 3 vols. London: G. G. and J. Robinson, Paternoster-Row
and J. Edwards, Pall-Mall.

Waihona `Āina Corp.
2001 *The Māhele Database*, <waihona.com>.

Wilkes, Charles
1845 *Narrative of the United States Exploring Expedition*. Volume 4. Philadelphia,
PA: Lea and Blanchard.

APPENDIX D

Avifaunal and Feral Mammal Field Survey

**AVIFAUNAL AND FERAL MAMMAL FIELD SURVEY FOR THE PROPOSED
WAIANAEO COAST EMERGENCY ACCESS ROAD, OAHU.**

Prepared for:

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Prepared by:

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10 August 2001

INTRODUCTION

The purpose of this report is to present the findings of a field survey of lands involved in the proposed Waianae Emergency Access Road, Oahu. References to pertinent literature and unpublished reports on the fauna in this region of the island were also consulted and are noted in this report. This information was used to supplement the field data collected on this survey. The goals of the field survey were to:

- 1- Document the species of birds and mammals currently on or near the lands involved in the proposed project.
- 2- Focus special attention on native and migratory species, particularly any that are listed as endangered.
- 3- Note the natural resources, if any that may be important to native and migratory species.

GENERAL SITE DESCRIPTION /STUDY AREA

The study area consisted of a 50-75 meters strip of land along both sides of the proposed emergency access road. Existing residential and secondary roads in the Nanakuli, Maili/Lualualei, Waianae and Makaha subdistricts comprise the majority of the proposed route. In a few places new roads will be needed to connect the existing roads. The habitats along the length of the route included residential lots, agricultural lands, and areas dominated by second growth introduced vegetation. The route crosses several streams which are generally dry except after a period of significant rainfall when they can flash flood. No wetland habitat usable by native waterbirds was noted along the

proposed route. The Nanakuli sub-district portion located makai of Farrington Highway has rock and sandy beach habitat.

SURVEY METHODS

The survey was conducted over a period of three days (20, 21 June and 8 August 2001). The entire proposed route was covered by driving the existing roads and walking the areas not accessible to vehicles. When driving the roads, stops were made to note birds that could be seen or heard at these locations. Records were also kept of all species encountered along the proposed route. Introduced species were simply noted while the number of each native and migratory species were tallied. The weather during the field survey was clear with light winds. Scientific and common names used in this report follow Ppyle (1997) and Honacki et al. (1982).

RESULTS AND DISCUSSION

Native Waterbirds:

One Black-crowned Night-Heron (*Nycticorax nycticorax*) was seen on 8 August along the shoreline in the Nanakuli sub-district. This species is not endangered or

threatened. They are the only native waterbird in Hawaii that is not so listed. Their ability to exploit a wide variety of habitats and prey may in part explain how they have managed to avoid the problems that have led to the decline and endangered status of other native waterbirds (Hawaii Audubon Society 1993). Previous surveys in this region found little suitable habitat for waterbirds (Bruner 1990, 1991, 1992, 1998, 1999).

Native Land Birds:

The only native land bird that might occur in the area of the proposed emergency access road is the Short-eared Owl or Pueo (*Asio flammeus sandwichensis*). This species is listed by the State of Hawaii as endangered on Oahu. None were recorded on this survey but the species is known to occur in Lualualei (pers. obser.). Pueo nest on the ground and are thus subject to mammalian predators. They forage during the early morning and late afternoon. Pueo take a wide variety of prey and utilize open agricultural lands, grasslands, and forests when hunting. Their decline on Oahu is most likely associated with urban expansion and loss of foraging habitat. No other native land birds would be expected in this area due to the absence of appropriate habitat for these species.

Migratory Birds:

Seven Pacific Golden-Plovers (*Pluvialis fulva*) were tallied on 8 August.

Migrants like plover breed in the artic and winter in Hawaii from August to the end of April. The June survey days did not record any migrants. All of the plover seen on 8 August were birds that had recently returned to Hawaii from the breeding grounds. This species has been intensively studied in Hawaii and Alaska (Johnson et al. 1981, 1989, 2001). The Pacific Golden-Plover is not listed as endangered. They prefer open habitats like lawns, fields and shorelines. Two other migrants that could be found along the coast rocky and sandy beaches are the Wandering Tattler on (*Heteroscelus incanus*) and the Ruddy Turnstone (*Arenaria interpres*). These species are likewise not endangered.

Introduced Birds:

Fifteen species in non-native introduced birds were recorded over the course of the survey. Table One lists these species. None are endangered. The array of species encountered on the survey are those typically found in this region of the island (Pratt et al. 1987).

Mammals:

A total of 14 Small Indian Mongoose (*Herpestes auropunctatus*) were tallied over the length of the survey. This diurnal predator is common in dry lowland habitats and agricultural lands. All of the cats and dogs seen were likely pets and not feral. Two Roof Rats (*Rattus rattus*) were found dead along the section of the proposed access road which lies makai of Farrington Highway in Nanakuli. The endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) is rarely recorded on Oahu (Tomich 1986, Kepler and Scott 1990). None were seen on this survey. They forage in a wide variety of habitats including urban areas and generally roost solitarily in trees.

CONCLUSIONS

The survey covered the entire proposed route for the emergency access road. The species of birds and mammals found on the survey were those that typically occur in this area. The only endangered species that might occasionally be seen in this region and at this location are the Short-eared Owl and the Hawaiian Hoary Bat. This proposed project should have no impacts on these two species. Likewise the project will not likely effect the relative abundance of introduced birds in this region of Oahu.

TABLE ONE

Introduced birds recorded along the proposed route of the Emergency Access Road, Oahu, Waianae.

COMMON NAME	SCIENTIFIC NAME
Cattle Egret	<i>Bubulcus ibis</i>
Ring-necked Pheasant	<i>Phasianus colchicus</i>
Spotted Dove	<i>Streptopelia chinensis</i>
Zebra Dove	<i>Geopelia striata</i>
Red-vented Bulbul	<i>Pycnonotus cafer</i>
Japanese Bush-warbler	<i>Cettia diphone</i>
White-rumped Shama	<i>Copsychus malabaricus</i>
Common Myna	<i>Acridotheres tristis</i>
Japanese White-eye	<i>Zosterops japonicus</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>
Red-crested Cardinal	<i>Paroaria coronata</i>
House Finch	<i>Carpodacus mexicanus</i>
House Sparrow	<i>Passer domesticus</i>
Common Waxbill	<i>Estrilda astrild</i>
Java Sparrow	<i>Padda oryzivora</i>

SOURCES CITED

- Bruner, P.L. 1990. Survey of the avifauna and feral mammals at the Makaha Valley Country Club property proposed for a Golf Course Extension, Waianae. Oahu. Unpubl. ms. Prep. for Group 70 Ltd.
- _____ 1991. Survey of the avifauna and feral mammals at the proposed Waianae Kai Golf Course Site, Waianae, Oahu. Unpubl. ms. Prep. for PBR-Hawaii.
- _____ 1992. Findings of an avifaunal and feral mammal survey of Upper Makua Valley, Oahu. Unpubl. ms. Prep. for Wilson Okamoto and Associates, Inc.
- _____ 1998. Faunal (Birds & Mammals) survey of Makua Beach, Oahu. Unpubl. ms. Prep. for Belt Collins & Associates.
- _____ 1999. Survey of the avifauna and feral mammals for the proposed AT&T Cable project – Makaha to Keawaula, Oahu. Unpubl. ms. Prep. for Townscape, Inc.
- Honacki, J.H., K.E. Kinman and J.W. Koepl eds. 1982. Mammals species of the world: a taxonomic and geographic reference. Allen Press, Inc., and the Association of Systematic Collections. Lawrence, Kansas.
- Johnson, O.W., P.M. Johnson and P.L. Bruner. 1981. Wintering behavior and site-faithfulness of Golden-Plovers on Oahu. 'Elepaio 41(12):123-130.
- Johnson, O.W., M.L. Morton, P.L. Bruner and P.M. Johnson 1989. Winter range and fat cyclicity in Pacific Golden-Plovers (*Pluvialis fulva*) and predicted migratory flight ranges. Condor 91:156-177.
- Johnson, O.W., P.L. Bruner, J.J. Rotella, P.M. Johnson and A.E. Bruner. 2001. A long term study of apparent survival in Pacific Golden-Plovers at a wintering ground on Oahu, Hawaiian Islands. The Auk 118(2):342-351.

- Kepler, C.B. and J.M. Scott. 1990. Notes on the distribution and behavior of the Endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) 'Elepaio 50(7):59-64.
- Pratt, H.D., P.L. Bruner and D.G. Berrett. 1987. A field guide to the birds of Hawaii and the tropical Pacific. Princeton University Press. Princeton, New Jersey.
- Pyle, R.L. 1997. Checklist of the birds of Hawaii – 1997. 'Elepaio 57(9):153-157.
- Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press. Honolulu.

**ADDENDUM TO THE AVIFAUNAL AND FERAL MAMMAL FIELD SURVEY
FOR THE PROPOSED WAIANAЕ COAST EMERGENCY ACCESS ROAD,**

OAHU

5 October 2001

INTRODUCTION

The purpose of this report is to present the findings of additional avifaunal and feral mammal field survey work for the proposed Waianae Coast Emergency Access Road on Oahu. Figure One shows the location of this additional field work. The site was visited on 2 October 2001. The entire area marked in Figure One was examined and nearby areas were also investigated. The goals of this field survey were the same as those in the original survey of the proposed emergency access road performed in June and August 2001. The species seen or heard were noted along with the natural resources at this location.

RESULTS

No native or migratory birds were tallied on this additional field survey. A total of 15 introduced species of birds were found on the survey. Three of these species, the Red Avadavat (*Amandava amandava*), Yellow-fronted Canary (*Serinus mozambicus*) and Northern Mockingbird (*Mimus polyglottus*), were not recorded on the original survey. In addition, three species found on the original survey conducted in June and August were not seen on this recent survey of additional lands. These species were the Japanese Bush-warbler (*Cettia diphone*), White-rumped Shama (*Copsychus malabaricus*) and Northern Cardinal (*Cardinalis cardinalis*). Table One gives the entire list of introduced species found on this additional site. None of these species are threatened or endangered. The only mammal recorded on this survey was the Small Indian Mongoose (*Herpestes auropunctatus*). Feral cats, rats and mice also likely occur in this area.

The habitat at this site (Fig. 1) includes a large, dry, grass and brush covered field surrounded by residential lots. A cement drainage ditch runs the length of the property along the makai boundary. Most of the bird activity was concentrated around the edges of the field and in the adjoining residential lands.

CONCLUSIONS / SUMMARY

The array of introduced species noted on this additional field survey were for the most part compatible with those tallied on the original field survey of the entire proposed route. As noted in the results three new species were added and three introduced species seen earlier were not found on this survey. No native land birds or migratory birds were observed on this additional site. The endangered Short-eared Owl or Pueo (*Asio flammeus sandwichensis*) could forage in the field located on this property. Migratory species like the Pacific Golden-Plover (*Pluvialis fulva*) may forage or rest in some of the more open sections of the site or on nearby lawns.

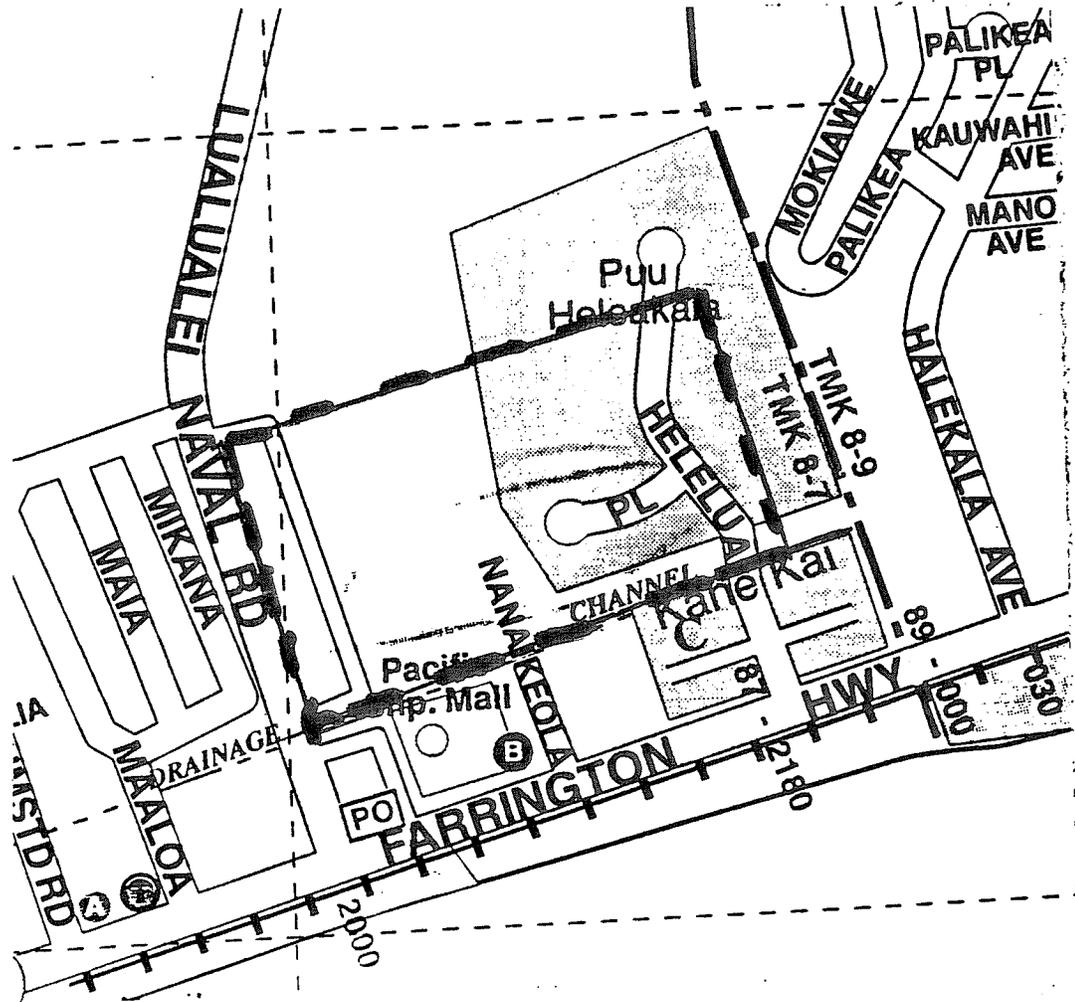


Fig. 1. Location of faunal survey indicated by dashed line.

TABLE ONE

Introduced birds recorded on additional lands proposed for the Waianae Coast Emergency Access Road, Waianae. Species not seen on original survey are marked ***.

COMMON NAME	SCIENTIFIC NAME
Cattle Egret	<i>Bubulcus ibis</i>
Ring-necked Pheasant	<i>Phasianus colchicus</i>
Spotted Dove	<i>Streptopelia chinensis</i>
Zebra Dove	<i>Geopelia striata</i>
Red-vented Bulbul	<i>Pycnonotus cafer</i>
Northern Mockingbird***	<i>Mimus polyglottus</i>
Common Myna	<i>Acridotheres tristis</i>
Japanese White-eye	<i>Zosterops japonicus</i>
Red-crested Cardinal	<i>Paroaria coronata</i>
House Finch	<i>Carpodacus mexicanus</i>
Yellow-fronted Canary***	<i>Serinus mozambicus</i>
House Sparrow	<i>Passer domesticus</i>
Common Waxbill	<i>Estrilda astrild</i>
Red Avadavat***	<i>Amandava amandava</i>
Java Sparrow	<i>Padda oryzivora</i>

APPENDIX E
Botanical Resources
Assessment

**BOTANICAL RESOURCES ASSESSMENT
WAI'ANAE COAST EMERGENCY ACCESS ROAD (WCEAR)
WAI'ANAE DISTRICT, O'AHU**

by

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Prepared for: TOWNSCAPE, INC.

October 2001

BOTANICAL RESOURCES ASSESSMENT
WAI'ANAE COAST EMERGENCY ACCESS ROAD (WCEAR)
WAI'ANAE DISTRICT, O'AHU

INTRODUCTION

The proposed emergency access road is designed to keep vehicular traffic flowing into and out of the leeward area when Farrington Highway is impassable due to a natural disaster or a manmade emergency. The proposed route consists primarily of existing public streets or roads within the subdistricts of Makaha, Wai'anae, Ma'ili/Lualualei, and Nanakuli. In some places, the proposed route will use private property to link existing public streets and roads. New roads would need to be constructed on these private properties and a few of the existing public streets and roads would be widened.

A reconnaissance site visit was made on 07 June 2001 to familiarize the various subconsultants with the location of the proposed route and to provide access onto the private parcels. Field studies to assess the botanical resources along the road segments to be built or widened were conducted on 19 and 20 June 2001 by a team of two botanists. Supplemental field studies for the Lualualei Naval Road to Halelua Place segment were conducted on 05 October 2001. The primary objectives of the field studies were to provide a general description of the vegetation on the proposed road corridor and to search for threatened and endangered species as well as species of concern.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other studies conducted in the general area. Project maps with the subdistricts identified were examined to determine terrain characteristics, access, boundaries, and reference points.

The proposed road corridors were flagged and staked prior to our field studies. A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, disturbances, drainage, exposure, topography, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium, and for comparison with the recent taxonomic literature.

DESCRIPTION OF THE VEGETATION

The plant names used in this report follow Wagner *et al.* (1990). The more recent name changes are those noted in Wagner and Herbst (1999), and Evenhuis and Eldredge (1999-2000).

A description of the vegetation along the proposed new roadway corridor to be constructed and along the existing streets to be widened follows; the description is broken down by subdistricts.

Makaha Subdistrict

The Wai'anae Emergency Access Road project proposes to utilize the portion of roadway which starts at the Makaha Valley Road/Kaulawaha intersection. The road is paved for a short distance and is bordered by a few homes. The road would need to be widened in this area and a few cultivated plants such as crown flower (*Calotropis gigantea*), mango (*Mangifera indica*), tamarind (*Tamarindus indica*), monkeypod (*Samanea saman*), etc., may be removed. The road corridor then follows along a coral-lined road and a recently bulldozed field which supports a few clumps of koa haole shrubs (*Leucaena leucocephala*), buffel grass (*Cenchrus ciliaris*), and kiawe trees (*Prosopis pallida*). As the proposed road corridor nears Maiuu Road, it becomes an existing paved road that is bordered by homes along its makai side. On the road's mauka boundary, the vegetation consists of kiawe trees with scattered clumps of buffel grass and Guinea grass (*Panicum maximum*).

From Maiuu Road, the proposed road corridor follows along an overgrown dirt road near a Board of Water Supply pumping station. Large, old monkeypod trees, 35 to 40 ft. tall, are found here; tree trunks are 3 to 4 ft. in diameter. Ground cover consists of Chinese violet (*Asystasia gangetica*) and Guinea grass. This area may have been used as a house site or supported other structures in the past. Besides the monkeypod trees, a few remnant plantings of jasmine (*Jasminum fluminense*), mock orange (*Murraya paniculata*), Mexican creeper (*Antigonon leptopus*), red hibiscus (*Hibiscus cultivar*), *Syngonium podophyllum*, and a large old mango tree are found here. The proposed road corridor then follows along a paved road which services the Board of Water Supply facility; the Board of Water Supply access road is gated near the Mahinaau intersection. Kiawe forest, 20 to 25 ft. tall, borders the access road. In

some places, koa haole forms small thickets 10 to 12 ft. tall. Ground cover consists of Guinea grass and buffel grass.

Mahinaau Road is a paved public road, but would need to be widened if this alignment is selected. A few homes are found along this road; landscaping consists of grassy lawns, usually Bermuda grass or manienie (*Cynodon dactylon*), and various plantings such as coconut (*Cocos nucifera*), *Hibiscus cultivars*, mango, etc. Undeveloped lots support kiawe forest with scattered patches of koa haole and clumps of buffel grass.

Wai'anae Subdistrict

Where the proposed road corridor goes around the mauka boundary of Kamaile Elementary School, the vegetation consists of kiawe forest, 20 to 25 ft. tall. Koa haole shrubs, 10 to 15 ft. tall, form large stands in those places where the kiawe trees are more widely spaced. Again, buffel grass and Guinea grass are the most abundant ground cover plants. An overgrown, unpaved road is also found here. Vegetation on this overgrown road is composed of scattered clumps of buffel grass, swollen fingergrass (*Chloris barbata*), false mallow (*Malvastrum coromandelianum*), 'uhaloa (*Waltheria indica*), virgate mimosa (*Desmanthus pernambucanus*), *Boerhavia coccinia*, and lion's ear (*Leonotis nepetifolia*). A few sourbush shrubs (*Pluchea carolinensis*) also occur here.

The proposed WCEAR project proposes to use a portion of the private property mauka of Ala Akau and Ala Hema streets for a new roadway corridor. Vegetation on this parcel consists of somewhat dense kiawe forest, 25 to 30 ft. tall, on the deeper soil areas mauka of Ala Akau Street. Buffel grass cover is dense and koa haole

occurs as scattered shrubs. Other plants occasionally observed here include hairy merremia (*Merremia aegyptia*), lion's ear, 'ilima (*Sida fallax*), and virgate mimosa.

On the area mauka of Ala Hema Street, the vegetation is open scrub with scattered large trees of Chinese banyan (*Ficus microcarpa*), monkeypod, and kiawe. Buffel grass forms low mats, 1 to 2 ft. tall, here and there. Other plants observed here in smaller numbers include prickly sida (*Sida spinosa*), 'ilima, 'uhaloa, spiny amaranth (*Amaranthus spinosus*), lion's ear, 'aheahea (*Chenopodium murale*), false mallow, hoary abutilon (*Abutilon incanum*), and sourbush. This area has been bulldozed in the past and there are piles of soil, coral, and boulders as well as piles of concrete rubble and rusted metal. Evidence of past fires, such as charred tree stumps, are common here.

Ma'ili/Lualualei Subdistrict

The proposed roadway corridor would cross private property to link Kaukama Road to Hakimo Road. The level portions of this property have been bulldozed and graded in most places. The proposed road corridor would follow along an existing unpaved road; this road is used by the Civil Defense in times of emergency. Vegetation along the road consists of scattered clumps of buffel grass and Guinea grass, and shrubs of sourbush. 'Ilima and 'uhaloa are locally common in places. Other plants found here include hoary abutilon, koa haole, young trees of kiawe, hairy merremia, golden crown-beard (*Verbesina encelioides*), and lion's ear. A shallow ditch which parallels the road supports low mats of saltbush (*Atriplex suberecta*) and swollen fingergrass. A few shrubs of the Hawaiian cotton or ma'o (*Gossypium tomentosum*) are found on the parcel. Two or three of the plants may be disturbed by the road construction.

The WCEAR project proposes to use a private road adjacent to the former Kaiser Cement Plant to link Pa'akea Road to Lualualei Naval Road. Where the road abuts farm lands, koa haole shrubs with clumps of Guinea grass and buffel grass form a narrow belt between the road and fields of green onions (*Allium fistulosum*) and Chinese parsley (*Coriandrum sativum*). Adjacent to the former cement plant, the vegetation is composed of stands of kiawe trees, 15 to 30 ft. tall, and koa haole thickets, 12 to 15 ft. tall. Ground cover consists of rather dense clumps of Guinea grass and buffel grass.

This private road is largely unpaved for most of its length and supports a weedy assortment of plants which include two species of saltbush (*Atriplex suberecta*, *A. semibaccata*), *Trianthema portulacastrum*, lion's ear, golden crown-beard, castor bean (*Ricinus communis*), *Sida ciliaris*, swollen fingergrass, creeping indigo (*Indigofera hendecaphylla*), etc. Where the road crosses a small, dry streambed, the vegetation is dominated by dense mats of California grass (*Brachiaria mutica*) with scattered plants of castor bean and clumps of Guinea grass.

Nanakuli Subdistrict

Within the Nanakuli Subdistrict, the proposed road corridor would cross private property (TMK 8-7-08: parcel 77 and 76) to link Lualualei Naval Road to Halelua Place. Vegetation on the parcels consists of very open koa haole scrub, 3 to 4 ft. Tall in most places, and clumps of buffel grass. Scattered throughout the parcels are a few small trees of kiawe, Java plum (*Syzygium cumuni*), and kalamungai or horseradish tree (*Moringa oleifera*). Both parcels have been bulldozed in the past; substrate is shallow, gray-colored soil over coral outcrop. One plant of the native

caper or maiapilo (*Capparis sandwichiana*) occurs on an area with exposed coral outcrop and a few small sinkholes.

The proposed road corridor would use a designated right-of-way makai of both the railroad right-of-way and Farrington Highway. The proposed road corridor would run between the intersection of Farrington Highway and Helelua Street and the intersection of Farrington Highway and Laumania Avenue. Where the proposed road corridor follows along the mauka boundary of Ulehawa Beach Park, the vegetation is sparse since most of this area has been recently excavated for a pipe line project. It is primarily barren sandy substrate with a few patches of Bermuda grass. The beach park contains large expanses of Bermuda grass and landscape plantings. The vegetation on the park area was surveyed by Char in 1998 when the beach park was expanded.

Where the proposed road corridor passes mauka of Nanaikapono Elementary School, the area is largely barren crushed coral and dirt substrate with scattered, weedy clumps of plants such as creeping indigo, coat buttons (*Tridax procumbens*), Guinea grass, buffel grass, *Sida ciliaris*, and kipukai or nena (*Heliotropium curassavicum*). The school lawn is primarily Bermuda grass with plantings of *Plumeria* cultivars, monkeypod, coconut, banyan (*Ficus* sp.), and bougainvillea (*Bougainvillea glabra*).

The proposed road corridor follows along the mauka side of Nanakuli Beach Park. Most of the designated right-of-way is paved. Landscaping consists of patches of Bermuda grass and a few weedy plants such as swollen fingergrass, wiregrass (*Eleusine indica*), and creeping indigo. A few kamani trees (*Calophyllum inophyllum*) have been planted along the park road.

Just before Laumania Avenue, the proposed road corridor will cross over Nanakuli Stream. Dense, yellow-green colored mats of pickleweed (*Batis maritima*), 2 to 3 ft. tall, line the stream and a small, low lying area adjacent to the stream.

DISCUSSION

The vegetation along those segments of the proposed emergency route which will have to be built or widened is dominated by introduced or alien plant species. Introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's arrival in the islands in 1778.

Areas which are periodically maintained such as around homes, parks, and schools support grassy lawns, usually composed of Bermuda grass, and landscape plantings such as plumeria, mango, coconut, hibiscus, monkeypod, etc. Undeveloped areas support kiawe forest and koa haole thickets with buffel grass and Guinea grass as the common ground cover plants. Dirt and coral-lined roads which cross the private properties support weedy, mostly herbaceous species. Most, if not all, of the undeveloped areas exhibit evidence of past disturbances; this includes bulldozing, fires, and dumping of trash or construction materials.

A few native species were observed during the field studies. Many of them prefer the more open, exposed areas; these are the 'ilima (*Sida fallax*), 'uhaloa (*Waltheria indica*), hoary abutilon (*Abutilon incanum*), and kipukai (*Heliotropium curassavicum*). These four species are indigenous, that is, they are native to the Hawaiian Islands and elsewhere. Three endemic species, i.e. native only to the Hawaiian Islands, were observed during the field studies. One small patch of

kauna'oa (*Cuscuta sandwichiana*), a yellowish-orange twining vine used for lei, is found where the proposed road corridor adjoins the former cement plant, near Lualualei Naval Road within the Ma'ili/Lualualei Subdistrict. Two or three plants of the Hawaiian cotton or ma'o (*Gossypium tomentosum*) would be disturbed by the proposed road segment which links Kaukama Road to Hakimo Road within the Ma'ili/Lualualei Subdistrict. One plant of maiapilo (*Capparis sandwichiana*), a sprawling shrub with large, fragrant, white flowers, occurs on the parcels between Lualualei Naval Road and Halelua Place within the Nanakuli Subdistrict.

None of the plants is a listed or proposed threatened and endangered species (U.S. Fish and Wildlife Service 1999; Wagner *et al.* 1999). The ma'o and maiapilo are species of concern. Species of concern means that there is a need for more biological and/or taxonomic information regarding whether a plant might require conservation actions in the future. The ma'o is considered a low priority item at present (U.S. Fish and Wildlife Service, 1999). It occurs on all of the main Hawaiian Islands, except Hawai'i, in dry lowland and coastal situations. In some places, ma'o is abundant and forms the ma'o shrubland plant community. On leeward O'ahu the plants are found in small numbers from the 'Ewa plains to Ka'ena Point. A few plants were found on the Maile Kai subdivision/Kaukama Road area (Linney and Char 1988). The maiapilo is also considered a low priority item for listing as threatened or endangered (U.S. Fish and Wildlife Service 1999). Maiapilo occurs on all of the main Hawaiian Islands along the coast or somewhat inland on coralline, basaltic rock, and soil substrates. It can also be found on the Northwestern or Leeward Hawaiian Islands of Midway Atoll, Pearl and Hermes Atoll, and Laysan (Wagner *et al.* 1990). On Oah'u, the largest populations are found at the former Barbers Point Naval Air Station and at Campbell Industrial Park on areas with coralline substrate or karst.

Given these findings, the proposed road corridor segments to be constructed or widened are not expected to have a significant negative impact on the botanical resources. There are no botanical reasons to impose any restrictions, impediments, or conditions to the Wai'anae Coast Emergency Access Road project.

LITERATURE CITED

- Char, W.P. (Char & Associates). 1998. Botanical resources assessment, Ulehawa Beach Park, Wai'anae District, O'ahu. Prepared for PBR Hawaii. September 1998.
- Evenhuis, N.L. and L.G. Eldredge, editors. 1999-2000. Records of the Hawaii Biological Survey. Bishop Museum Occasional Papers Nos. 58-64.
- Linney, G.K. and W.P. Char (Char & Associates). 1988. Botanical survey, Maili Kai property, Maili, Waianae District, Oahu. Prepared for PBR Hawaii. January 1988.
- U.S. Fish and Wildlife Service. 1999. U.S. Fish and Wildlife Service species list, plants. March 23, 1999. Pacific Islands Ecoregion Office, Honolulu, HI.
- Wagner, W.L. and D.R. Herbst. 1999. Supplement to the Manual of flowering plants of Hawai'i, p. 1855-1918. *In*: Wagner, W.L., D.R. Herbst, and S.H. Sohmer, Manual of the flowering plants of Hawai'i. Revised edition. 2 vols. University of Hawai'i Press and Bishop Museum Press, Honolulu.
- Wagner, W.L., M.M. Brueggmann, D.R. Herbst, and J.Q.C. Lau. 1999. Hawaiian vascular plants at risk: 1999. Bishop Museum Occasional Papers No. 60.
- Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and Bishop Museum Press, Honolulu. Bishop Museum Special Publication 83.

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APPENDIX F

Traffic Survey

Description of Traffic Conditions

Existing Conditions

Farrington Highway is the primary roadway serving traffic along the Waianae Coast. It is a four-lane divided highway from Kapolei to Kahe Point serving high-speed traffic (posted speed limit of at least 45 miles per hour). North of Kahe Point the posted speed limit is reduced to 35 miles per hour. Farrington Highway from Kahe Point through Waianae is an undivided four-lane highway. Fronting Waianae High School, a median left turn lane is introduced as a fifth lane. In Makaha, Farrington Highway becomes a two-lane undivided roadway.

The State Highways Division collects traffic count information and estimates average daily traffic (ADT) and peak hour volumes for segments of each of the highways under their jurisdiction. Historically, traffic volumes along the Waianae Coast have increased as population increased. In the shorter term, however, traffic volumes have been steady, with average daily volumes along most of the highway decreasing since 1995, as shown in Table (a). The latest traffic information, for year 1999, was published in early 2001. Table (b) shows the ADT and peak hourly volumes for 1999.

Table (a)

Average Daily Traffic – Farrington Highway (1995 to 1999)

<u>Highway Segment</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>
North of Lawaia Street	2,404	1,806	1,805	1,791	1,975
Lawaia Street to Water Street	5,483	5,323	5,321	4,185	4,968
Water Street to Jade Street	10,322	9,610	9,606	9,002	8,666
Jade Street Waianae High School	16,091	14,651	14,642	15,812	15,967
Waianae High School to Waianae Valley Road	25,612	22,482	20,522	23,022	23,098
Waianae Valley Road to Hakimo Road	32,402	32,807	29,784	30,182	30,446
Hakimo Road to Nanakuli Avenue	38,401	38,211	34,639	35,315	37,533
South of Nanakuli Avenue	38,800	37,662	35,852	38,556	41,025

* "Levels of Service" (LOS) range from "LOS A" describing low densities and free flow, to "LOS D" describing heavy, but stable, flow, "LOS E" describes near-capacity conditions, and "LOS F" describes over capacity conditions.

The maximum number of vehicles that can use Farrington Highway between Nanakuli Avenue and Waianae High School is limited by the capacities at traffic signals at intersections. The lack of left turn lanes on the highway at several major intersections in Nanakuli affects the southbound capacity, as left turning traffic that waits for a gap in northbound traffic effectively blocks one lane. Southbound capacity is estimated to be 1,800 vehicles per hour while northbound capacity is estimated to be 2,100 vehicles per hour. Near Nanakuli Avenue, peak hour, peak direction traffic volume is near capacity, with conditions being described as Level of Service E*. As volumes decrease to the north, conditions improve; at Hakimo Road, peak hour volumes are approximately 60% of capacity, which would be Level of Service C.

These volumes represent traffic demands on the average weekday with distinct commuter peak periods. Morning (AM) peak hours typically occur between 7:00 AM and 8:00 AM and afternoon (PM) peak hours between 4:00 PM and 5:00 PM. While data on traffic demand on weekends are not readily available, total daily volumes are approximately the same but the morning and afternoon peaks are not obvious and demands are spread over the entire day. The weekday pattern is considered in this assessment.

Highway Segment	1999 ADT		AM Peak Hour		PM Peak Hour	
	SB	NB	SB	NB	SB	NB
North of Lawaia Street	1,975	80	65	95	115	115
Lawaia Street to Water Street	4,968	165	135	185	185	185
Water Street to Jade Street	8,666	340	180	325	325	325
Jade Street to Waianae High School	15,967	925	415	480	720	720
Waianae High School to Waianae Valley Road	23,098	810	810	810	810	810
Waianae Valley Road to Hakimo Road	30,446	1,005	820	915	1,370	1,370
Hakimo Road to Nanakuli Avenue	37,533	1,465	975	985	1,830	1,830
South of Nanakuli Avenue	41,025	1,735	935	1,075	2,000	2,000

SB = southbound toward Kahe Point NB = northbound toward Kaena Point

1999 Traffic Volumes - Farrington Highway

Table (b)

Two-lane streets that intersect Farrington Highway provide access to the valleys and other areas away from the main roadway. To the east (mauka of) the highway, some of these streets connect to other local streets parallel to Farrington Highway to provide short alternate routes for north-south traffic. Volumes on streets that intersect Farrington Highway vary, as indicated in Table (c). Peak hours vary, but generally occurred between 6:15 AM and 9:00 AM and between 3:15 and 6:00 PM. Average volumes on these streets are approximately 150 vehicles per hour in each direction, or about 75% of the capacity of a single minor street lane at a signalized intersection during normal conditions.

Farrington Highway is the only major route serving traffic parallel to the coastline along the Waiānae Coast. Pipeline failures, construction or repair work, storm surf, tsunami, traffic crashes, or other incidents affecting public safety result in closure of all or a portion of the roadway, reducing the roadway capacity and increasing delays and frustration to highway users. Portions of the roadway have been closed (complete closure or reduction in the number of lanes) several times during the past few years.

As Farrington Highway continues north through Makaha, it becomes a two-lane roadway, capacity drops to approximately 800 vehicles per hour in one direction. Peak hourly volumes in this area are less than 50 percent of capacity, and conditions can be described as Level of Service B or better.

Though Waiānae, numerous driveways enter Farrington Highway from both sides as it becomes an urban arterial. Capacities are estimated to be 1,800 vehicles per hour in either the southbound or the northbound direction. Peak hour, peak direction volumes are approximately 50 percent of capacity, or Level of Service B. In localized areas, such as in front of Waiānae High School, peak hourly volumes are higher than those identified for the longer roadway segments and conditions may be worse.

Other Traffic Counts – East of Farrington Highway		Roadway (month counted)	
24-hour,	2-way total	WB	EB
AM Peak Hour	WB	EB	WB
PM Peak Hour	WB	EB	EB
Jade Street (January 1993)	2,796	139	84
Old Government Road (1/93)	6,643	326	231
Waiānae Valley Road (June 1999)	5,598	198	143
St. John's Road (June, 1999)	3,636	184	193
Kaukama Road (February 1995)	1,577	89	108
Lualualei Naval Road (June 1999)	8,217	319	190
			467
			163

Table (c)

Discussion of Project Effects

The proposed project will provide new roadway connectors so that portions of the local street system can provide service as alternative routes for traffic that normally would use Farrington Highway, during times that the highway is closed. The proposed project includes several components that, when combined with existing local streets, will allow traffic to move through the area.

The proposed emergency connector roadways will provide a single lane for traffic in each direction, and will be useable by City buses. The capacity of the designated roadway system has been estimated to be one vehicle every 2½ seconds per lane, or 1,440 vehicles per hour in each direction. Portions of the designated system are on existing roadways carrying approximately 150 vehicles per hour in each direction. The potential increase in traffic volume on the existing roadways will be significant in comparison to existing volumes, but increased traffic will only occur during emergencies when traffic is diverted from the adjacent segment of Farrington Highway.

A portion of the existing traffic will be affected by any emergency situation; however, local travel will still occur and each emergency connector roadway is expected to be able to handle up to 1,350 vehicles per hour from the highway.

North of Waianae Valley Road in Makaha and through most of Waianae, where the peak hourly volumes on Farrington Highway are less than 1,000 vehicles per hour in one direction, the emergency roadway system will be able to handle the diverted traffic. Traffic conditions on the detour will be moderate to congested. The impacts of increased traffic on local streets will include added noise and air pollution, increased difficulty in entering traffic from driveways and sidestreets, and possibly the temporary loss of on-street parking. Increased travel distances for traffic diverted from Farrington Highway and slower speeds will increase travel times; however, when compared with the existing situation where very little traffic can move when the highway is closed, travel delays will be minimized.

Between Waianae Valley Road and Hakimo Road, the emergency connectors will need to carry traffic volumes of 1,370 vehicles in the PM Peak Hour in the northbound direction;

this would be slightly more than the estimated capacity of 1,350 vehicles per hour. If a closure occurs during the PM Peak Hour, a queue may form as the traffic demand exceeds capacity. The congested period would last slightly more than one hour, as demands will drop below the capacity in the following hour. The emergency connector between Waiānae and Hakimo Road would be able to handle the diverted traffic at times other than the PM Peak Hour. Impacts to the local streets and for users would be similar to those described for the Waiānae and Makaha areas.

Closures of the highway south of Hakimo Road at any time during the morning or afternoon peak hours will result in congestion and long queues as peak hour demands will exceed the capacity provided by the emergency road system. Capacity conditions on the emergency roads will last more than one hour, and some users will be delayed for more than an hour as hourly demand exceeds the capacity. Table (d) illustrates an estimate for traffic flow for a closure occurring at 2:00 PM north of Lualualei Naval Road.

Table (d)

Illustrative Example – Detour of Farrington Highway North of Lualualei Naval Road

Counted NB volume*	Detour Traffic capacity volume	Queue formed excess vehicles
617	0	0
617	675	0
605	675	0
662	675	0
870	675	195
941	675	266
885	675	210
818	675	143
735	675	60
717	675	42
629	675	(46)
496	675	(179)
476	675	(199)
434	675	(241)
406	675	(251)
395	675	0

* from count taken on June 2, 1999 on Farrington Highway, northbound, north of Lualualei Naval Road (from State Highways Division, *Traffic Survey Data – Island of Oahu 1999*).

In the example, the opening of the emergency road coincides with an incident and the closure of both northbound lanes of Farrington Highway at 2:00 PM. Between 2:00 PM and 3:30 PM, the detoured traffic will be between 90% and 98% of the capacity of the emergency roadway. The flow will be a continuous stream, and the majority of the additional travel time incurred by users will be due to the longer path and the slower speed on the emergency road, as compared with the normal path along the highway.

About 3:30 PM, however, traffic demand will exceed the capacity and a queue (line of cars) will begin to form. By 4:00 PM, the queue will have about 200 vehicles. Meanwhile, the emergency roadway is carrying the capacity flow. In the next half-hour, the demand continues to exceed capacity, and the length of the queue more than doubles. The buildup of the queue continues until 6:30 PM, at which time the queue would number about 900 vehicles. Delays to vehicles arriving at this time may be about 40 minutes ($900 = 2/3$ of the 1,350 vehicles per hour capacity). After 6:30 PM, when demand drops below capacity, the queue begins to dissipate. However, capacity flow on the emergency roadway would continue for another 2½ hours before the queue completely dissipates.

While the proposed emergency roadway system would not completely alleviate traffic congestion when the highway is closed in Maili or Nānakuli, it does allow for continued flow of some traffic with the eventual accommodation of the demand. Without the emergency roadways, flow would be virtually halted until the highway can be opened. The length of the period of flow at capacity and the length of the queue would vary depending on when the closure occurs and how quickly Farrington Highway can be reopened.

