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MAR 23 2021

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March 16, 2021

Mr. Keith E. Kawaoka
Office of Environmental Quality Control
Department of Health
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT AND ANTICIPATED FINDING OF NO SIGNIFICANT IMPACT FOR THE PROPOSED HAWAIIAN HUMANE SOCIETY EWA CAMPUS
EWA DISTRICT, ISLAND OF OAHU, HAWAII

Dear Mr. Kawaoka:

Enclosed is the City and County of Honolulu, Department of Community Services (DCS), Draft Environmental Assessment of Anticipated Finding of No Significant Impact (DEA-AFONSI) for the proposed Hawaiian Humane Society Ewa Campus on the Island of Oahu, for review and publication in the next available edition of The Environmental Notice.

In addition to this letter, the online Office of Environmental Quality Control (OEQC) Publication Form has been submitted through the OEQC website. The online submittal includes one electronic copy of the DEA-AFONSI as an Adobe Acrobat PDF file.

Should you have any questions please contact Shane Akagi, Administrator Office of Grants Management at (808) 768-7715 or the Hawaiian Humane Society. We value your participation in the environmental review process. Your letter will be included in the forthcoming Draft Environmental Assessment.

Sincerely,

Sarah Allen
Director

Attachment

21-135

From: webmaster@hawaii.gov
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice
Date: Tuesday, March 16, 2021 11:01:34 AM

Action Name

Hoʻopili Hawaiian Humane Society

Type of Document/Determination

Draft environmental assessment and anticipated finding of no significant impact (DEA-AFNSI)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds

Judicial district

ʻEwa, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 9-1-181: 042

Action type

Applicant

Other required permits and approvals

See Section 8 of the Draft EA

Discretionary consent required

City and County of Honolulu, Department of Community Services Approval

Approving agency

City and County of Honolulu, Department of Community Services

Agency contact name

Pablo Venenciano

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Yes

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Action summary

The Hawaiian Humane Society proposes to develop a new West Oʻahu Campus on an approximately 5.473-acre parcel, Tax Map Key (1) 9-1-181:042, that falls within the Hoʻopili master-planned community. The proposed site is bordered by Fort Weaver Road to the east and the Old Fort Weaver Road to the north. The proposed facility will include an approximately 20,745 square foot (sf) building containing facilities for admissions, vet services, education, adoption, storage, maintenance, dog/cat kennels, and offices. The facility will also include parking and loading areas, dog park, three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, two approximately 324 sf dog acquaintance areas, an approximately 554 sf small animal pavilion, two approximately 156 sf gazebos, and an onsite detention basin.

Reasons supporting determination

Refer to Section 10.3 of the Draft EA for Significance Criteria Assessment.

Attached documents (signed agency letter & EA/EIS)

- HHS-HOOPILI-DEA-3.15.21.pdf
- FY20-HHS_DEA-REQ2Publish-OEQC-3_16_21.PDF

Action location map

- HHS-Project-Site.zip

Authorized individual

Brian Takeda, Planning Project Manager

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

Draft Environmental Assessment
Prepared in Accordance with Hawaii Revised Statutes,
Chapter 343, and Hawaii Administrative Rules, Title 11, Chapter 200.1

Ho‘opili Hawaiian Humane Society

Ho‘opili, Island of O‘ahu, Hawai‘i

March 2021

Prepared For:
Hawaiian Humane Society
2700 Wai‘alae Avenue
Honolulu, Hawai‘i 96826

Prepared By:
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawai‘i 96819-3494

Draft Environmental Assessment

Ho‘opili Hawaiian Humane Society

Ho‘opili, Island of O‘ahu, Hawai‘i

March 2021

Prepared For:
Hawaiian Humane Society
2700 Wai‘alae Avenue
Honolulu, Hawai‘i 96826

Prepared By:
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2024 North King Street, Suite 200
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Project No. 1-23699-00P

Table of Contents

Page
Acronyms and Abbreviations i
Section 1 Project Summary 1
Section 2 Project Purpose and Location 2
2.1 Background 2
2.2 Purpose and Need for Project 7
2.3 Purpose of Environmental Assessment 8
2.4 Project Location 8
Section 3 Project Description, Estimated Construction Cost and Schedule 9
3.1 Description of Proposed Project 9
3.2 Construction Activities 26
3.3 Property Ownership 26
Section 4 Project Alternatives and Preferred Alternative 29
4.1 Alternatives to the Proposed Action 29
4.2 No Action Alternative 29
4.3 Delayed Action 29
4.4 Preferred Alternative 30
Section 5 Description of Existing Site Conditions, Potential Impacts, and Proposed Mitigation 31
5.1 Existing Site Conditions 31
5.1.1 Description 31
5.1.2 Potential Impacts and Proposed Mitigation 31
5.2 Climate 32
5.2.1 Description 32
5.2.2 Potential Impacts and Proposed Mitigation 32
5.3 Geology and Topography 32
5.3.1 Description 32
5.3.2 Potential Impacts and Proposed Mitigation 33
5.4 Water Resources and Hydrology 34
5.4.1 Surface Water 34
5.4.2 Groundwater 37
5.5 Soils and Potential for Hazardous Materials 38
5.5.1 Description 38
5.5.2 Potential Impacts and Proposed Mitigation 41
5.6 Wetlands 42
5.6.1 Description 42
5.6.2 Potential Impacts and Proposed Mitigation 42
5.7 Natural Hazards 42
5.7.1 Description 42
5.7.2 Potential Impacts and Proposed Mitigation 46

5.8 Flora and Fauna ... 49
5.8.1 Terrestrial Flora ... 49
5.8.2 Terrestrial Fauna ... 50
5.9 Noise Conditions ... 53
5.9.1 Description ... 53
5.9.2 Potential Impacts and Proposed Mitigation ... 53
5.10 Air Quality ... 54
5.10.1 Description ... 54
5.10.2 Potential Impacts and Proposed Mitigation ... 54
5.11 Visual Resources ... 55
5.11.1 Description ... 55
5.11.2 Potential Impacts and Proposed Mitigation ... 55
5.12 Socio-Economic Environment and Demographics ... 55
5.12.1 Description ... 55
5.12.2 Potential Impacts and Proposed Mitigation ... 57
5.13 Public Facilities and Services ... 58
5.13.1 Roads and Transportation ... 58
5.13.2 Utilities ... 61
5.13.3 Solid Waste ... 65
5.13.4 Police Protection ... 66
5.13.5 Fire Protection ... 66
5.13.6 Health Care and Emergency Services ... 67
5.13.7 Schools and Libraries ... 68
5.13.8 Recreational Resources ... 69
5.14 Archeological and Historic Resources ... 71
5.14.1 Description ... 71
5.14.2 Potential Impacts and Proposed Mitigation ... 71
Section 6 Cultural Impact Assessment ... 72
Section 7 Relationship to Land Use Policies, Plans, and Controls ... 75
7.1 Federal ... 75
7.1.1 Federal Aviation Administration Order 5190.6B ... 75
7.2.1 Americans with Disabilities Act ... 76
7.2 State of Hawaiʻi ... 76
7.2.1 Hawaiʻi State Plan ... 76
7.2.2 Hawaiʻi State Functional Plans ... 80
7.2.2 Hawaiʻi State Land Use Law ... 81
7.2.3 Hawaiʻi State Environmental Policy ... 83
7.2.4 Clean Water Act ... 84
7.2.5 Hawaiʻi Coastal Zone Management Program ... 85
7.3 City and County of Honolulu ... 90
7.3.1 General Plan ... 90

7.3.2 ʻEwa Development Plan 92
7.3.3 Hoʻopili Urban Design Plan 92
7.3.4 Land Use Ordinance 94
7.3.5 Special Management Area 94
Section 8 Permits and Approvals That May Be Required 96
8.1 Federal 96
8.1 State of Hawaiʻi 96
8.2 City and County of Honolulu 96
Section 9 Agencies, Organizations, and Individuals to be Consulted for the Environmental Assessment 97
9.1 State of Hawaiʻi 97
9.2 City and County of Honolulu 97
9.3 Elected Officials, Organizations and Individuals 98
9.4 Pre-Assessment Consultation for the Environmental Assessment 98
9.5 Draft Environmental Assessment Comments and Responses 106
Section 10 Summary of Effects 107
10.1 Short Term Effects 107
10.2 Long Term, Secondary, and Cumulative Effects 108
10.3 Significance Criteria 111
Section 11 Summary of Findings and Significance Determination 119
References 120

Figures

Figure 2-1. Project Location 5
Figure 2-2. Proposed HHS Hoʻopili Campus Location 6
Figure 3-1. Proposed HHS Hoʻopili Campus 11
Figure 3-2. HHS Hoʻopili Site Plan 12
Figure 3-3. First Floor Admissions Building Floor Plan 13
Figure 3-4. First Floor Clinic Floor Plan 14
Figure 3-5. First Floor Admissions Floor Plan 15
Figure 3-6. First Floor Holding and Warehouse Floor Plan 16
Figure 3-7. First Floor Entry and Classroom Floor Plan 17
Figure 3-8. Second Floor Admissions Floor Plan 18
Figure 3-9. Admission Building ʻEwa and Mauka Sections 19
Figure 3-12. Adoption Pavilions and Acquaintance Areas Floor Plans 22
Figure 3-13. Adoption Pavilions Sections 23
Figure 3-14. Small Animal Pavilion, Acquaintance Area, and Gazebo Sections 24
Figure 3-15. Driveway Entry Site Plan 25
Figure 5-1. Surface Waters 35
Figure 5-2. Soil Types 39
Figure 5-3. Wetland Map 43
Figure 5-4. Flood Zones 45
Figure 5-5. Sea Level Rise Map 47

Figure 5-6. Parks and Recreation Areas 70
Figure 7-1. State Land Use Districts 82
Figure 7-2. Hoʻopili Urban Design Plan Concept Sketch 93
Figure 7-3. CCH Zoning Districts 95

Tables

Table 5-1. Population and Demographics 56
Table 7-1. Hawaiʻi State Plan Applicability to the Proposed Project 77
Table 9-1. Comments Received During the Pre-Assessment Consultation for the EA 99
Table 10-1. Hoʻopili HHS Project Impacts Summary 115

Appendices

Appendix A Analysis of Projected Animal Sheltering Services for Hawaiian Humane Society's Mōʻiliʻili and Second Facilities, Letter Report. Prepared for Hawaiian Humane Society. Prepared by Helber Hastert & Fee Planners Inc. May 2011.

Appendix B Botanical Resources Assessment for the Hoʻopili Project, Honolulu, Oʻahu. Prepared for PBR Hawaiʻi & D.R. Horton – Schuler Division. Prepared by LeGrande Biological Surveys Inc. August 2006.

Appendix C A Survey of Avian and Mammalian Resources for the Ho'opili Development Project, 'Ewa District, O'ahu, Hawai'i. Prepared for PBR Hawaiʻi. Prepared by Rana Productions, Ltd. February 2008.

Appendix D Arthropod Survey and Assessment Ho'opili Project, 'Ewa District, O'ahu, Hawai'i. Prepared for PBR Hawaiʻi & D. R. Horton – Schuler Division. Prepared by Pacific Analytics, L.L.C. May 2008.

Appendix E An Archaeological Inventory Survey for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu. Prepared for D. R. Horton - Schuler Division. Prepared by Cultural Surveys Hawai'i, Inc. July 2006.

Appendix F Cultural Impact Assessment for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu. Prepared for D. R. Horton - Schuler Division. Prepared by Cultural Surveys Hawai'i, Inc. December 2006.

Appendix G Reserved for Traffic Impact Assessment

Appendix H Pre-Assessment Consultation Letters for Hawaiʻi Revised Statutes, Chapter 343.

Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
AIS	Archaeological Inventory Survey
BMPs	Best Management Practices
BWS	Board of Water Supply, CCH
CAB	Clean Air Branch
CCH	City and County of Honolulu
CIA	Cultural Impact Assessment
CO	Carbon Monoxide
CWA	Clean Water Act
CWB	Clean Water Branch
CWRM	Commission on Water Resource Management, DLNR
cy	Cubic Yards
CZM	Coastal Zone Management
DBFS	Department of Budget and Fiscal Services
DLNR	Department of Land and Natural Resources, State of Hawaiʻi
DOFAW	Division of Forestry and Wildlife, DLNR
DOH	Department of Health, State of Hawaiʻi
DP	Development Plan
DPP	Department of Planning and Permitting, CCH
EA	Environmental Assessment
EALs	Environmental Action Levels
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
F	Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
HAR	Hawaiʻi Administrative Rules
HECO	Hawaiian Electric Company
HFD	Honolulu Fire Department
HHS	Hawaiian Humane Society
HPD	Honolulu Police Department

Acronyms and Abbreviations

HRS	Hawai'i Revised Statutes
kV	Kilovolt
LID	Low Impact Development
LUST	Leaking Underground Storage Tank
MG	Million Gallons
NEPA	National Environmental Policy Act
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
O_3	Ozone
OEQC	Office of Environmental Quality Control
Pb	Lead
psi	pounds per square inch
RWSA	Recycled Water Service Agreement
sf	Square Feet
SHPD	State Historic Preservation Division
SMA	Special Management Area
SO_2	Sulfur Dioxide
TAM	Technical Assistance Memorandum
TMK	Tax Map Keys
TRB	Traffic Review Branch
UDP	Urban Design Plan
USACE	U. S. Army Corps of Engineers
USDA	U. S. Department of Agriculture
USFWS	U. S. Fish and Wildlife Service
WOUS	Waters of the United States
WQC	Water Quality Certification
WQS	Water Quality Standards
WSS	Water System Standards

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Section 1
Project Summary

Project:	Hoʻopili Hawaiian Humane Society (HHS)
Project Applicant:	HHS
Approving Agency:	Department of Community Services, City and County of Honolulu (CCH)
Agent:	R. M. Towill Corporation
Location:	ʻEwa Beach, ʻEwa District, Island of Oʻahu, Hawaiʻi
Proposed Action:	The HHS proposes to develop a new West Oʻahu Campus on an approximately 5.473-acre parcel that falls within the Hoʻopili master-planned community. The proposed site is bordered by Fort Weaver Road to the east and the Old Fort Weaver Road to the north. The proposed facility will include an approximately 20,745 square foot (sf) building containing facilities for admissions, vet services, education, adoption, storage, maintenance, dog/cat kennels, and offices. The facility will also include parking and loading areas, a spacious dog park, three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, two approximately 324 sf dog acquaintance areas, an approximately 554 sf small animal pavilion, two approximately 156 sf gazebos, and an onsite detention basin.
Present Use:	Vacant
Tax Map Keys (TMK):	TMK (1) 9-1-181:042
Land Area:	Approximately 5.473 acres
Flood Zones:	Zones D and X
State Land Use District:	Urban
Special Management Area (SMA):	Not in SMA
CCH Zoning:	B-1 (Neighborhood Business District) and P-2 (General Preservation)
Permits That May be Required:	FEDERAL: Federal Aviation Administration (FAA) Order 5190.6B STATE: Environmental Assessment (EA) under Hawaiʻi Revised Statutes (HRS), Chapter 343; HRS, Chapter 6E Review; Section 402, Clean Water Act (CWA), National Pollutant Discharge Elimination System (NPDES) permit for construction storm water; Recycled Water Application; and Americans with Disabilities Act (ADA) Review CCH: Building, Grubbing, Grading, Stockpiling, Trenching, and Street Usage Permits; Traffic Control Plans; Recycled Water Service Agreement; and Plan Approvals
Anticipated Determination:	Finding of No Significant Impact (FONSI)

Section 2
Project Purpose and Location

2.1 Background

The HHS is an education and advocacy animal welfare organization that shelters, protects, rescues, reunites, and rehomes animals. For 130+ years, the HHS has been a part of life on O‘ahu, from protecting over-worked carriage horses to rescuing over-bred dogs from puppy mills and crafting legislation to strengthen Hawaii's animal-protection laws. In 1900, a single HHS humane officer responded to 849 cases of animal mistreatment including 285 overworked horses and mules. Today, the HHS's ten humane officers respond to nearly 16,000 calls annually to assist animals in the community and are available 24 hours a day, 7 days a week to respond to any animal in need.

It is the mission of the HHS to promote the human-animal bond and the humane treatment of all animals. Its purpose includes serving as a shelter and safety net for animals that people cannot provide care for, or are unwanted, abandoned, or lost, and to empower people to do more for animals in their care and animals within their reach by increasing individual responsibility and community activism for animals.

The HHS offers several programs for people and animals, including:

Educational and Outreach initiatives:
- Outreach programs for at-risk individuals and families
- Provide resources to pet owners in need, keeping families together
- Public education to break the cycle of violence linking animal abuse to an early warning sign of family violence
- Pet care classes
- School and community group visits

Pet fostering for:
- Animals too young for adoption
- Animals under the care of our medical team that need time to heal
- Pets of victims fleeing domestic violence
- Pets of disaster victims

Gathering place for the community:
- Meeting space
- Community events
- Dog park

Pet sterilization:
- Free feral cat sterilizations
- Administration of the city's neuter now program for low-cost pet sterilization
- Financial assistance for low-income families

- Community Spay/Neuter Center at the Mōʻiliʻili Campus

Pet visitation:
- People and pets visiting patients at hospitals, senior care facilities, and hospices

Rescue, care, and rehome:
- Rescue lost, abandoned, neglected, or abused animals
- Reunite owners with lost pets
- Provide a safe place for pets in need
- Prosecute animal cruelty and neglect cases
- Pet microchipping
- Placing pets in forever homes

The HHS's prevention, education, and outreach programs impact more than 10,000 youth in underserved communities and an additional 10,000+ individuals through the HHS's pet food bank, pet visitation program to hospice and health care facilities, emergency foster care program for pet owners in crises.

The HHS also offers in-shelter veterinary care to perform an array of services from vaccines, microchips, dental procedures, minor to more intensive medical procedures, and spay and neutering of all animals prior to adoption. In addition, the HHS is contracted by the CCH to provide animal services. The contracted scope of work includes providing shelter and care to all stray animals received at the shelter as well as field services work, which includes the humane capture and care of aggressive, loose dogs and responding to animal emergencies, where an animal's life or public safety is being imminently threatened.

The HHS embraces an animal sheltering model called Socially Conscious Sheltering. All animal welcoming, care, and shelter spaces have been designed for the welfare of each animal. Most older shelters were designed to take care of the maximum number of animals in institutional cages and pens. This can cause unnecessary stress to the animals, promote negative behaviors, and impair the health of the animals. The HHS utilizes new generation shelters, which are designed to optimize the behavioral, psychological, and socialization needs of the animals and the people who visit them, as well as for ease of cleaning, maintenance, and disease control. This, in turn, creates more positive people experiences and therefore more successful adoptions, leading to the HHS's successful placement of approximately 30,000 homeless pets with families over the last five years.

This year the HHS will:

- Find new and loving homes for 8,000 pets
- Help more than 20,000 animals in need of nourishment, shelter, medical attention, and tender, loving care
- Respond to 16,000 calls for help from our community
- Reunite 3,500 lost pets with their owners
- Sterilize 11,000 pets

The HHS currently operates at an existing campus in Mōʻiliʻili, in the center of the busy urban core of Honolulu. This site serves as the largest animal shelter and welfare organization for Oʻahu's nearly one million residents, which includes an estimated population of more than 300,000 owned cats and dogs. The Mōʻiliʻili campus was originally constructed in 1942. Renovations and additions to the Mōʻiliʻili campus have been completed over the past 70+ years, with the most recent expansion in 2016. However, there is still an unmet need for HHS's services.

On any given day, hundreds of community members access the existing Mōʻiliʻili facility and programs for a variety of reasons ranging from adopting a pet, searching for a lost pet, purchasing a pet microchip, participating in a humane values youth educational experiences, or utilizing the community spay/neuter center. Thousands more receive assistance by phone or are aided by a field officer. The volume of animals cared for by the HHS, the increase in the number of community members who access the Mōʻiliʻili facility, and the expansion of HHS programs, among other realities, have rendered the current Mōʻiliʻili campus space-constrained and unable to meet the growing needs for HHS's services, particularly in the growing West Oʻahu region.

With the populations of both humans and animals in West Oʻahu growing, facilitated by the CCH ʻEwa Development Plan (DP) with a focus on the steady urbanization in the Secondary Urban Center, there is an increased demand for HHS services in the ʻEwa region. More than 60 percent of West Oʻahu residents currently have pets and that number is expected to increase over time. Additionally, the Mōʻiliʻili campus is difficult to access for a large percentage of Oahu's population who live in West Oʻahu and other areas outside of Honolulu's urban core. Therefore, people who may need HHS services currently find it too inconvenient or are simply unable to access them. As such, to meet the growing demands and changing needs of the community the HHS proposes to construct a second site in West Oʻahu.

The proposed Hoʻopili campus will be located within a vacant approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) that falls within the Hoʻopili master-planned community, in ʻEwa Beach, ʻEwa District, Island of Oʻahu, Hawaiʻi. The proposed site is bordered by Fort Weaver Road to the east and the Old Fort Weaver Road to the north. See **Figure 2-1, Project Location.** The new campus will include an approximately 20,745 sf building containing facilities for admissions, vet services, education, adoption, storage, maintenance, dog/cat kennels, and offices. The campus will also include parking and loading areas, a spacious dog park, three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, two approximately 324 sf dog acquaintance areas, an approximately 554 sf small animal pavilion, two approximately 156 sf gazebos, and an onsite detention basin. See **Figure 2-2, Proposed HHS Hoʻopili Campus Location**.

Figure 2-1. Project Location

Figure 2-2. Proposed HHS Ho'opili Campus Location

2.2 Purpose and Need for Project

The purpose of the project is to provide a new HHS Hoʻopili West Oʻahu campus that will be an important resource for the community and provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, as well as for ease of cleaning, maintenance, and disease control
- Services open 7-days-a-week to support the needs of the community
- Adoption services and facilities
- Spay and neutering services
- Volunteer opportunities for youth and adults
- A dog park for the community

The new Hoʻopili campus is needed to meet the demands for HHS services of the growing ʻEwa region and Secondary Urban Center and reach a new population that may be unable to access the existing Mōʻiliʻili campus. The growth of both human and animal populations in West Oʻahu facilitated by the CCH ʻEwa DP with a focus on the steady urbanization in the Secondary Urban Center has resulted in an increased demand for HHS services in the ʻEwa region. Additionally, more than 60 percent of West Oʻahu residents currently have pets and that number is expected to increase over time. As it is already difficult for a large percentage of Oahu's population who live in West Oʻahu and other areas outside of Honolulu's urban core to access the HHS's existing Mōʻiliʻili campus, many are currently unable to access HHS programs, and this is expected to increase with population growth.

In 2011 Helber Hastert & Fee undertook an analysis to quantify projected use at a second facility and implications of the new facility on the usage at the Mōʻiliʻili facility (**Appendix A**). The data showed that demand exists for a second facility in the 'Ewa region currently (based on theoretical assignments) and that this demand will grow in the future (based on population projections). With the highest percentage of population growth expected to occur in the 'Ewa and Central O'ahu DP Areas, and employment in the 'Ewa DP Area projected to increase over the long-term (2030), demand for HHS services in the ʻEwa region is expected to increase. The data also indicate that despite geographic distances from Mōʻiliʻili, outlying DP Areas such as Wai'anae and North Shore generate higher per-capita admissions than closer communities such as the Primary Urban Center and East Honolulu. Furthermore, per-capita dog adoptions are highest in Central O'ahu, an area that is more likely to frequent a facility in 'Ewa. This suggests that there may even be pent-up demand that is not accounted for by population-based analysis, as a more conveniently-located facility could attract additional new users.

However, even with the introduction of a new facility, the data also support the continued need for a quality animal sheltering facility at the existing Mōʻiliʻili site. This is because, although the overall volume of animals served at the Mōʻiliʻili facility is anticipated to decrease with the construction of a second facility, it will still serve nearly half of the total number of animals sheltered by HHS. The new Hoʻopili campus will work in concert with the existing Mōʻiliʻili

campus where the administrative functions will continue to be housed. The new Hoʻopili campus will provide core services and accommodate the needs of approximately half the population of the island and provide animal admissions, adoptions, field services, lost and found, animal care and holding, and sterilization surgeries.

The operation of both campuses will allow for the furtherance of the HHS's mission to promote the human-animal bond and the humane treatment of all animals. The operation of the two facilities will also allow for the HHS to maintain improved environments for the animals in its care which, among other things, 1) minimizes stress on the animals, employees, and volunteers, 2) improves the health and welfare of the animals at the facility, and 3) reinforces positive animals behavior, all of which positively impact successful animal adoption outcomes.

2.3 Purpose of Environmental Assessment

The purpose of this EA is to address the requirements of HRS, Chapter 343, and Hawaiʻi Administrative Rules (HAR), Chapter 11-200.1. The specific action that requires the preparation of this EA includes the use of state or county funds for the proposed action. This EA provides information and evaluation of the potential for adverse environmental impacts on the natural and built environment associated with the proposed project. This EA will also inform interested parties of the proposed project and seek public comment on relevant environmental issues that should be addressed during the preparation of the Final EA.

2.4 Project Location

The HHS proposes to develop a new West Oʻahu Campus on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) that falls within the Hoʻopili master-planned community in ʻEwa Beach, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu, Hawaiʻi. The proposed site is bordered by Fort Weaver Road to the east and the Old Fort Weaver Road to the north. See **Figure 2-1, Project Location**

Section 3
Project Description, Estimated Construction Cost and Schedule

3.1 Description of Proposed Project

The proposed project involves the construction of a new HHS Hoʻopili campus on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) that falls within the Hoʻopili master-planned community in ʻEwa Beach, Oʻahu, Hawaiʻi. The proposed layout for the new HHS campus is shown on **Figure 3-1, Proposed HHS Hoʻopili Campus and Figure 3-2, HHS Hoʻopili Site Plan**. The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
- Services available 7-days-a-week to support the needs of the community
- Adoption services and facilities
- Spay and neutering services
- Volunteer opportunities for youth and adults
- A dog park for the community

The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area, temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of different feline populations (isolation space, medical care, young kittens, etc.), individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

An adoptions lanai will be located on the first floor and consist of a sheltered, open-air space, that contains adoption information, a help desk, and a retail shop. A classroom on this floor will be provided for educational programming, youth camp, and field trips, orientation for new staff members and volunteers, public-animal related activities, and staff meetings. A volunteer check-in area on the first floor will be provided for volunteers to store belongings and check-in with staff and other volunteers. The first floor will also contain offices for staff, computer stations, storage rooms, maintenance rooms, supply rooms, a food preparation room, a grooming room, a laundry room, a reception area, and bathrooms. Patios and lanais will also be provided on the ground floor. The second floor will contain office space and a breakroom for HHS employees and volunteers. See **Figures 3-3 to 3-10**.

South of the main building, the HHS Hoʻopili campus will have six adoption pavilions, including three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, and an approximately 554 sf small animal pavilion. Two approximately 324 sf dog acquaintance areas

for potential adopters to meet and greet dogs on a one-on-one basis will also be provided. See **Figures 3-11 to 3-14**.

South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort. See **Figure 3-1**.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road and discharges into a State box culvert northeast of the project site. No impacts to the swale are expected.

To convey off-site runoff from the proposed development, an underground culvert system comprised of two 36-inch diameter pipes would be installed. A 25,500 cubic foot detention basin, installed near the north-eastern corner of the project site, would then capture and control discharges to the nearby State box culvert. The detention basin would be approximately 9,900 sf in area and about 3.5 feet high. The detention basin has been designed to manage and mitigate all additional stormwater runoff from the project site and keep the rate of discharge to the State box culvert below existing levels.

Access to the HHS Hoʻopili campus will be via an interim driveway constructed off Old Fort Weaver Road along the northern side of the project site (see **Figure 3-15**). An interim driveway will be used because this segment of the Old Fort Weaver Road will be removed and realigned as part of the Hoʻopili Master Plan. The interim driveway and its future permanent replacement will be designed to comply with CCH regulations. Parking and loading areas along the north and west sides of the project site, connections to utilities, and landscaping consisting of grass, trees, and tropical foliage will also be installed at the project site (see **Figures 3-1 and 3-2**).

Overall, the development of the new HHS Hoʻopili campus will help to meet the growing demands for HHS services on Oʻahu and in the growing ʻEwa region. Once constructed, the new Hoʻopili campus will provide core services and accommodate the needs of approximately half the population of Oʻahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mōʻiliʻili campus where the administrative functions will continue to be housed.

Similar to the HHS Mōʻiliʻili campus, the HHS Hoʻopili campus will be open for animal admissions, including lost and found services, daily from 7 am to 8 pm, with emergency services available 24/7. Adoption center hours will be Monday through Friday from 11 am to 7 pm, and Saturday and Sunday 10 am to 6 pm. The HHS Hoʻopili campus will be closed most major holidays.

Figure 3-1. Proposed HHS Ho'opili Campus

Figure 3-2. HHS Ho'opili Site Plan

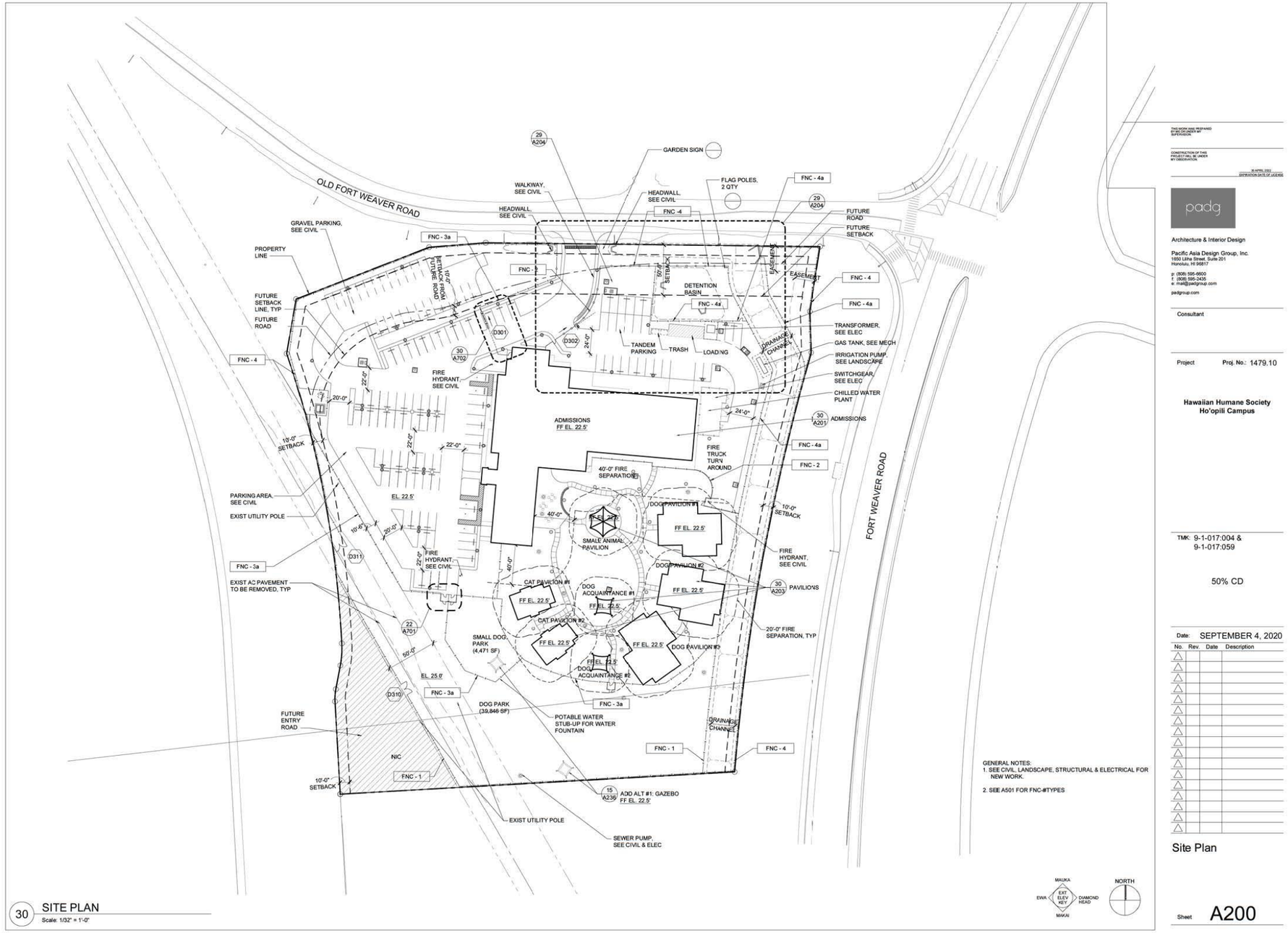


Figure 3-3. First Floor Admissions Building Floor Plan

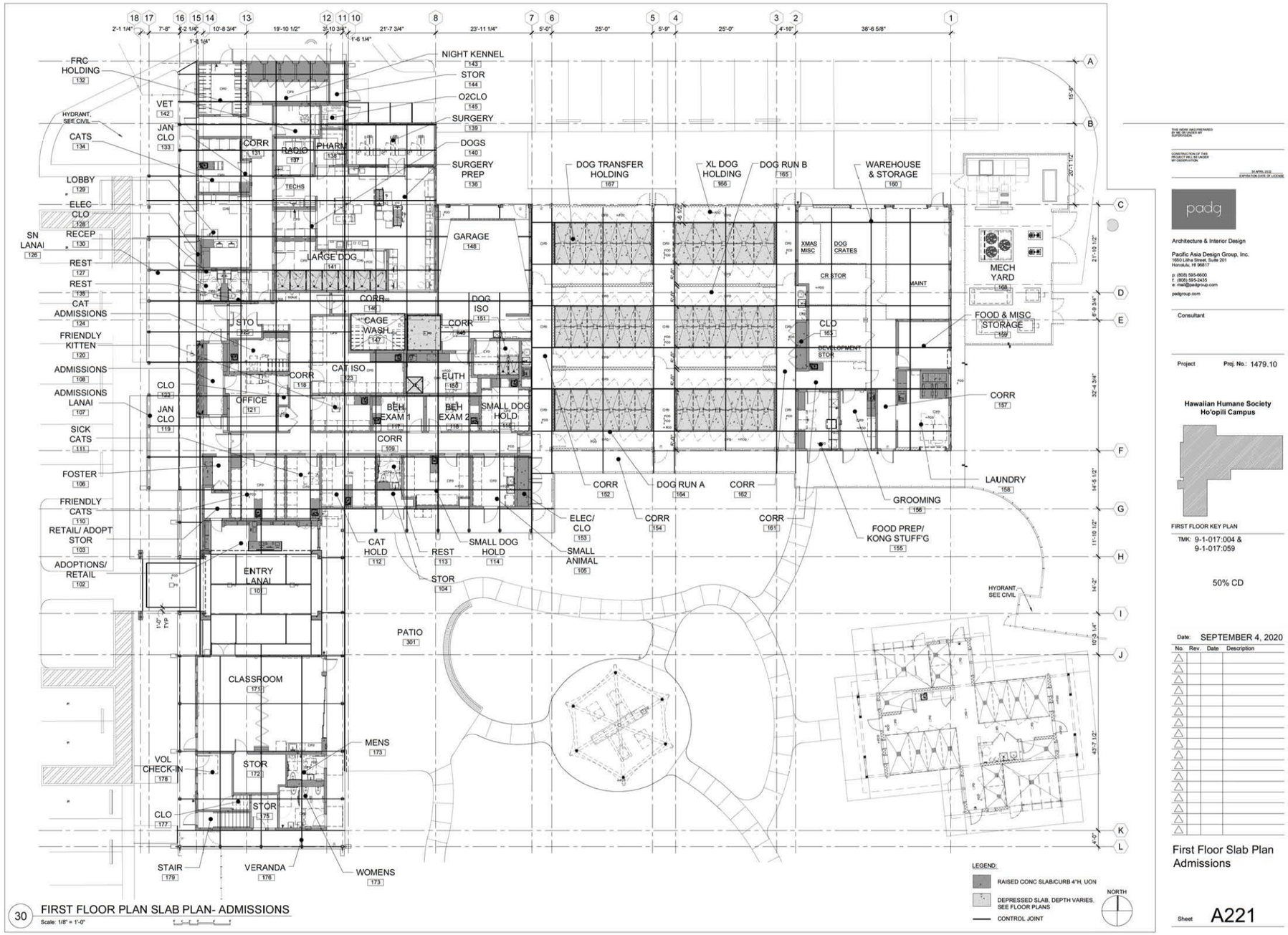


Figure 3-4. First Floor Clinic Floor Plan

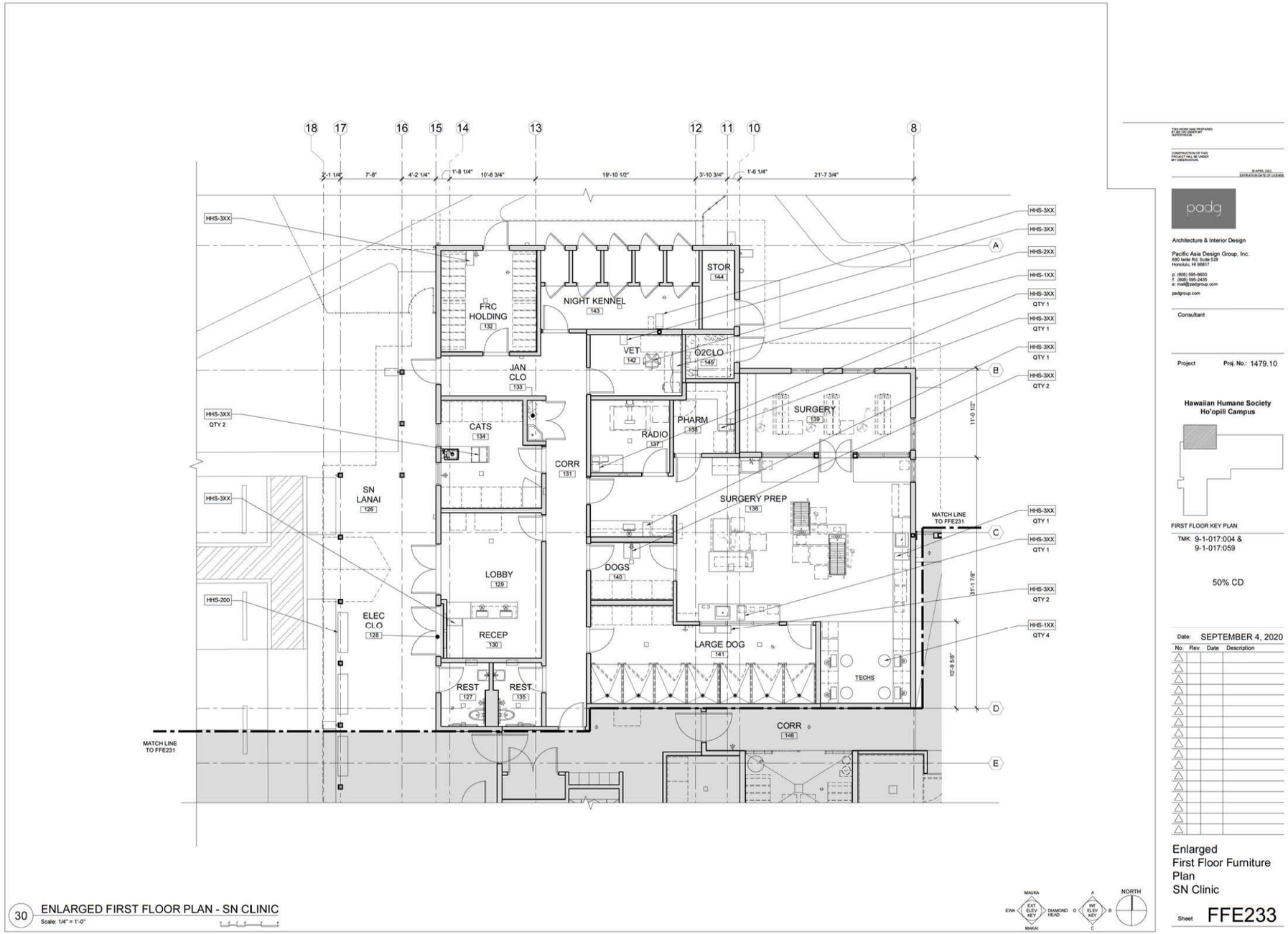


Figure 3-5. First Floor Admissions Floor Plan

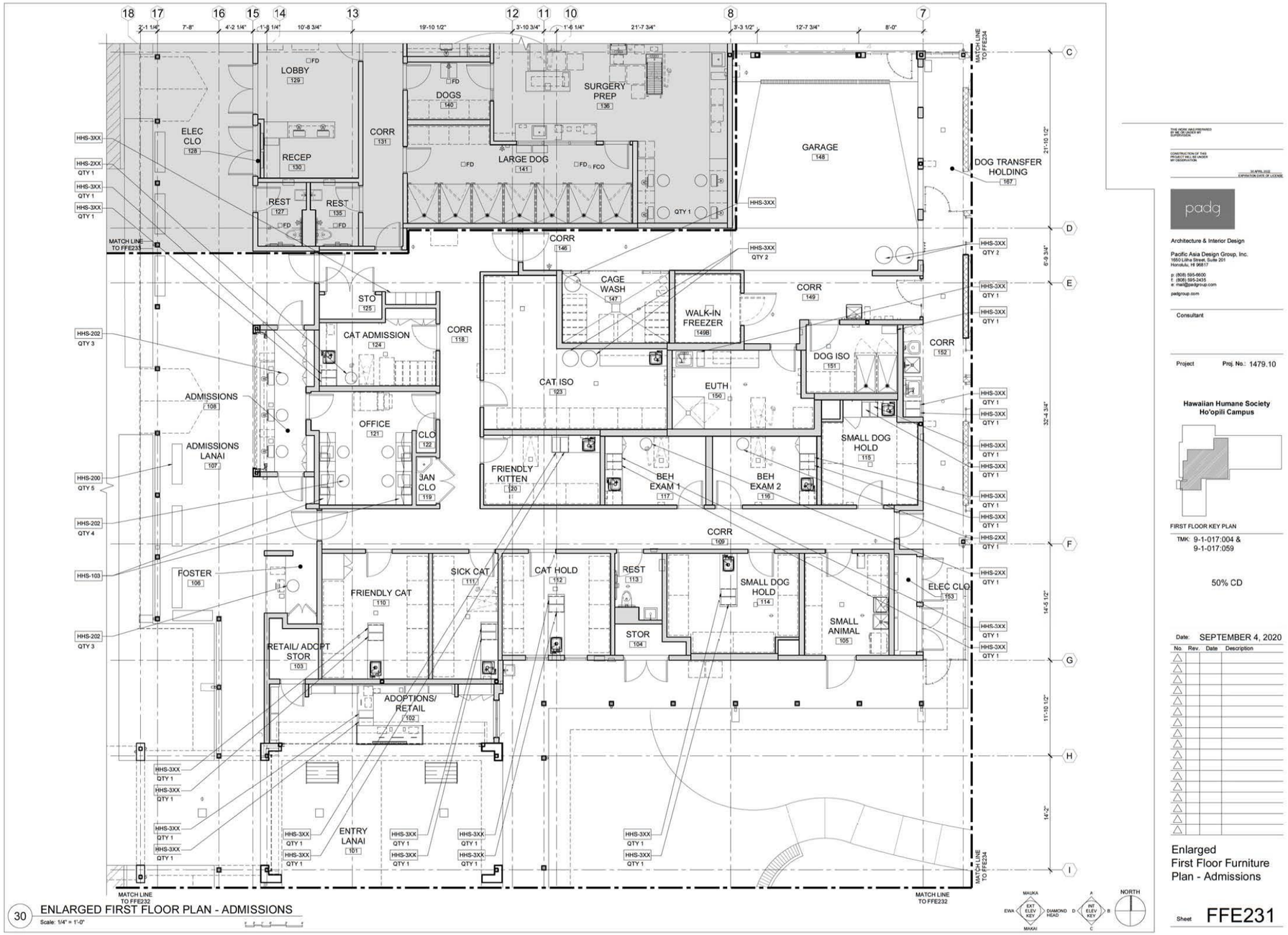


Figure 3-6. First Floor Holding and Warehouse Floor Plan

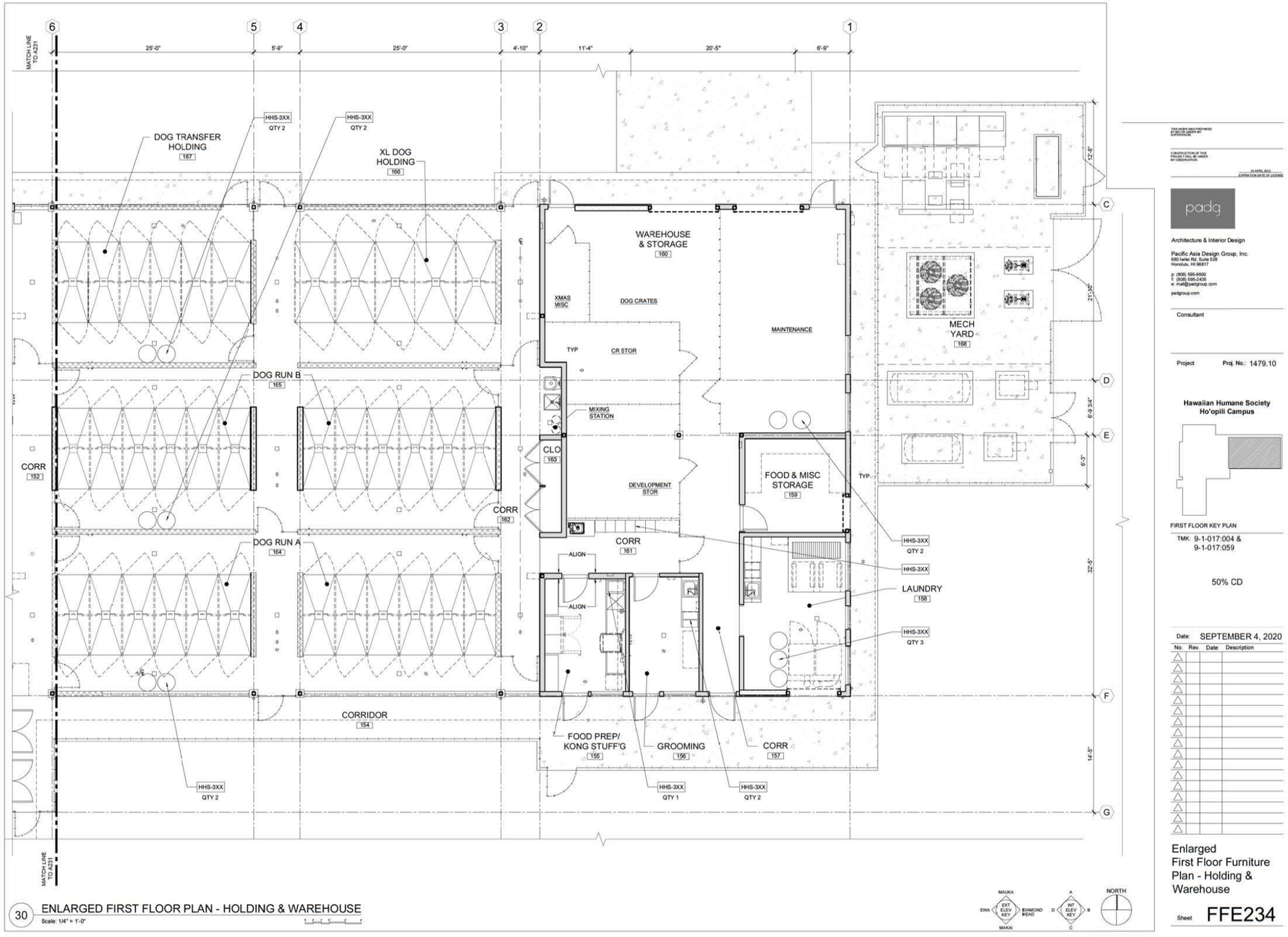


Figure 3-7. First Floor Entry and Classroom Floor Plan

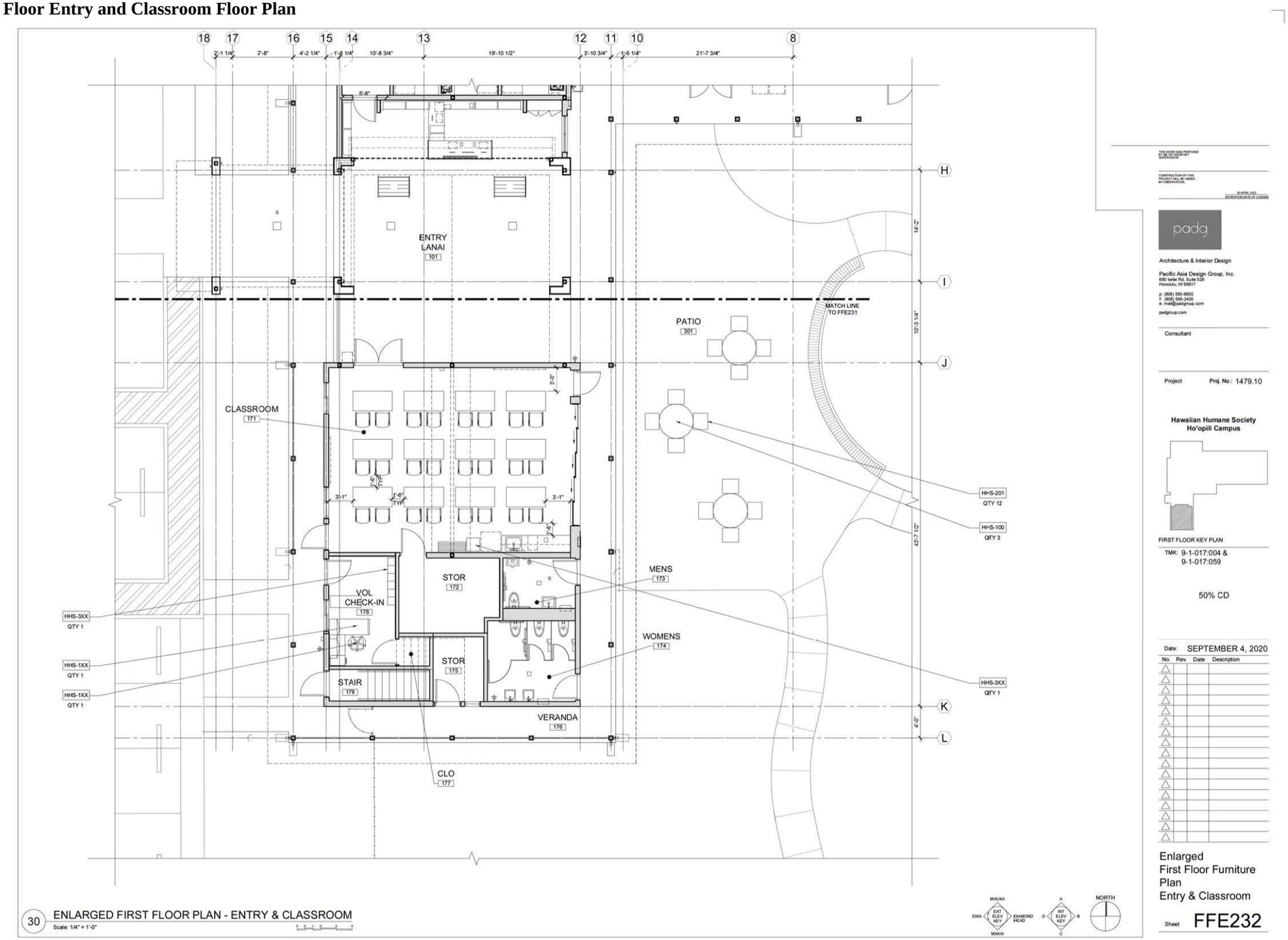


Figure 3-8. Second Floor Admissions Floor Plan

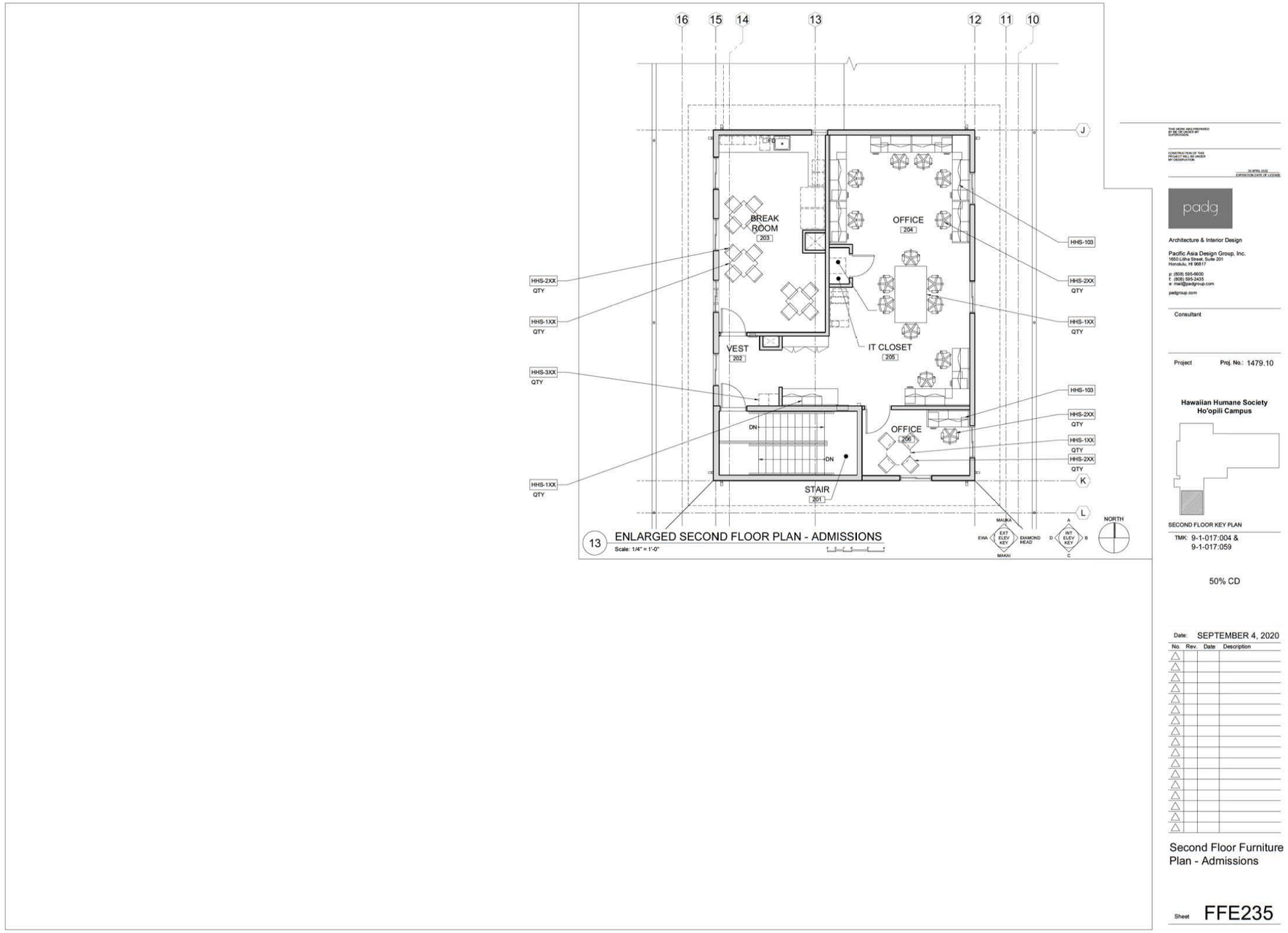


Figure 3-9. Admission Building 'Ewa and Mauka Sections

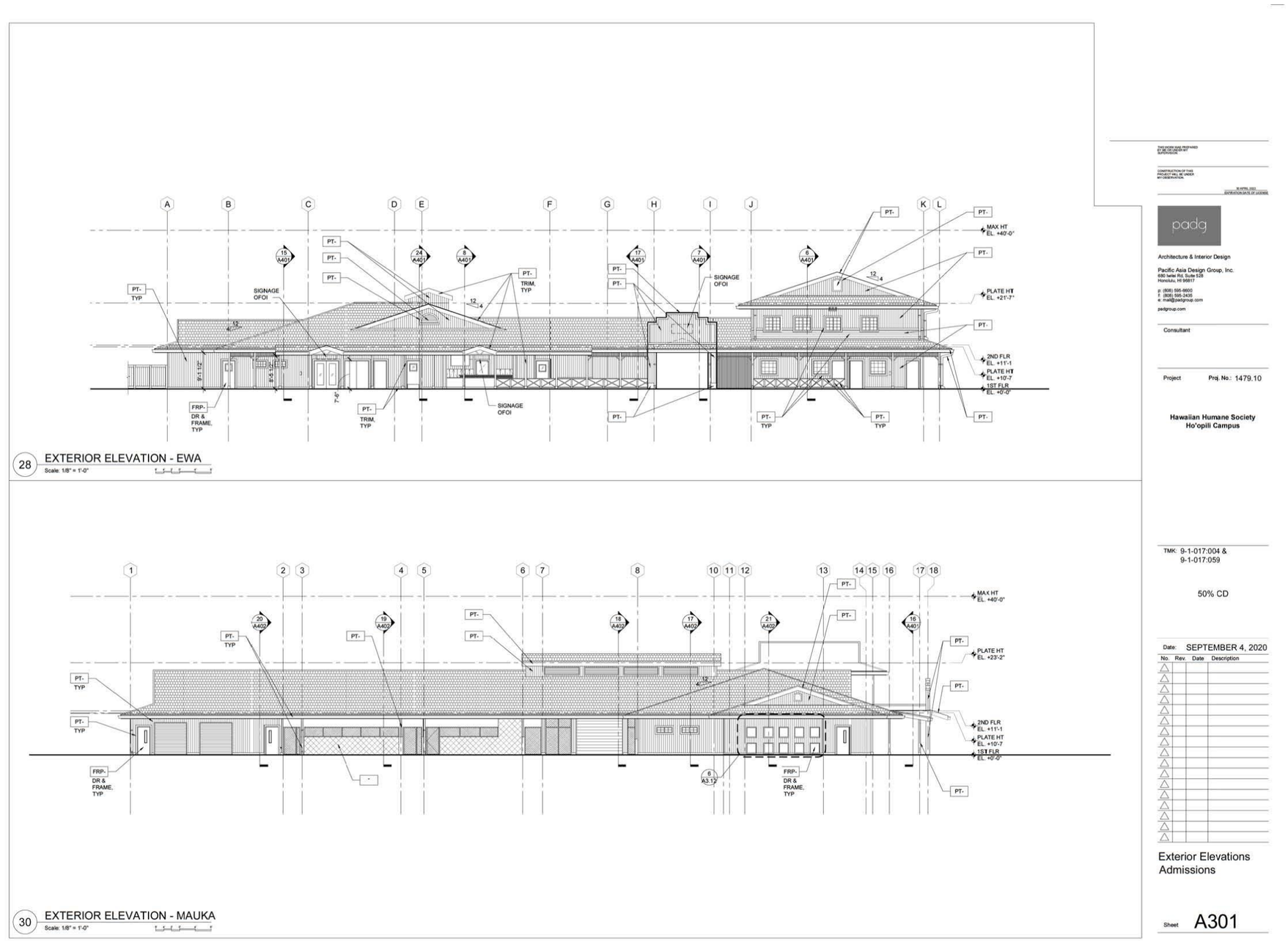


Figure 3-10. Admission Building Diamond Head and Makai Sections

Figure 3-11. Adoption Pavilions and Acquaintance Areas Site Plan

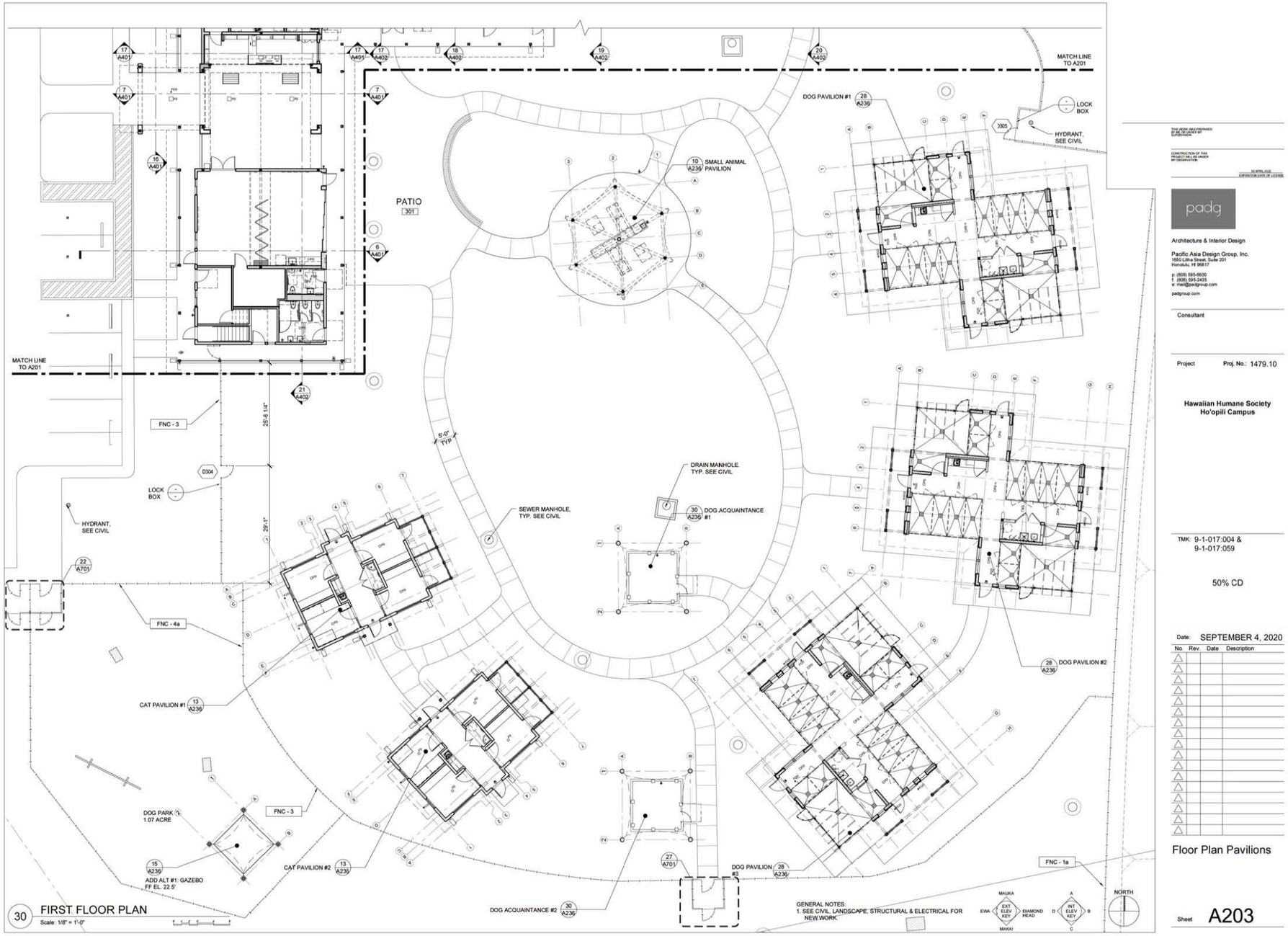


Figure 3-12. Adoption Pavilions and Acquaintance Areas Floor Plans

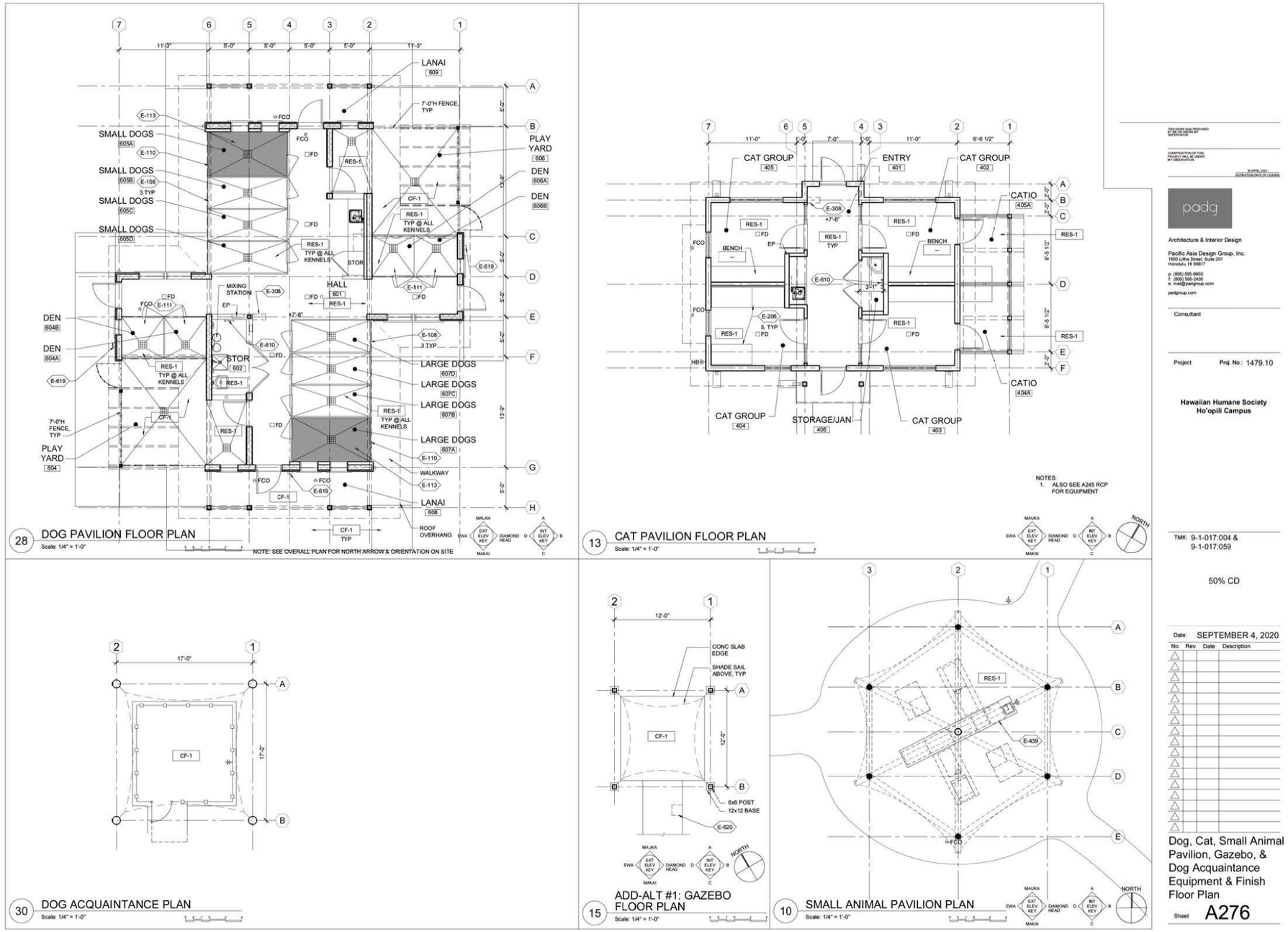


Figure 3-13. Adoption Pavilions Sections

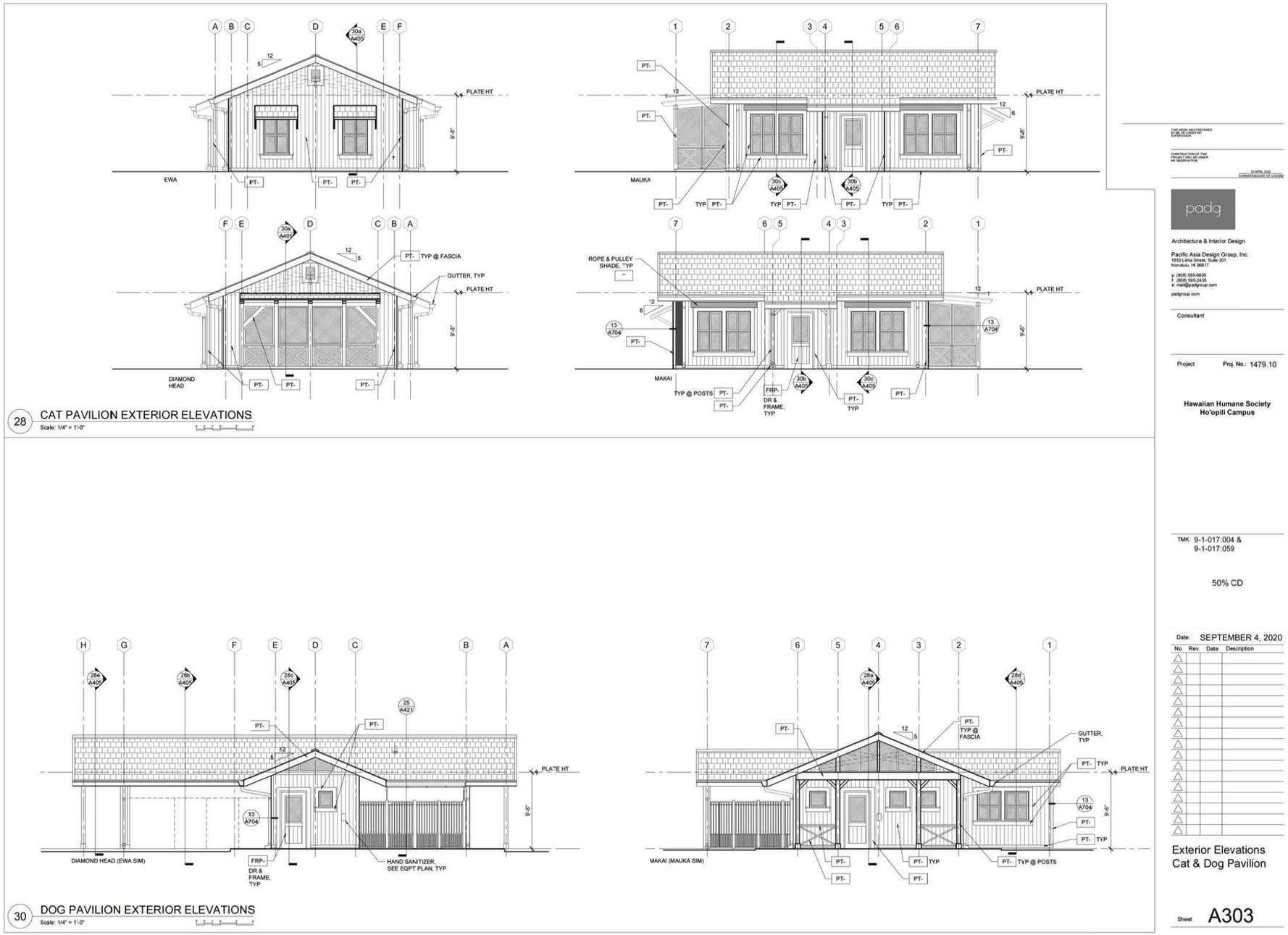


Figure 3-14. Small Animal Pavilion, Acquaintance Area, and Gazebo Sections

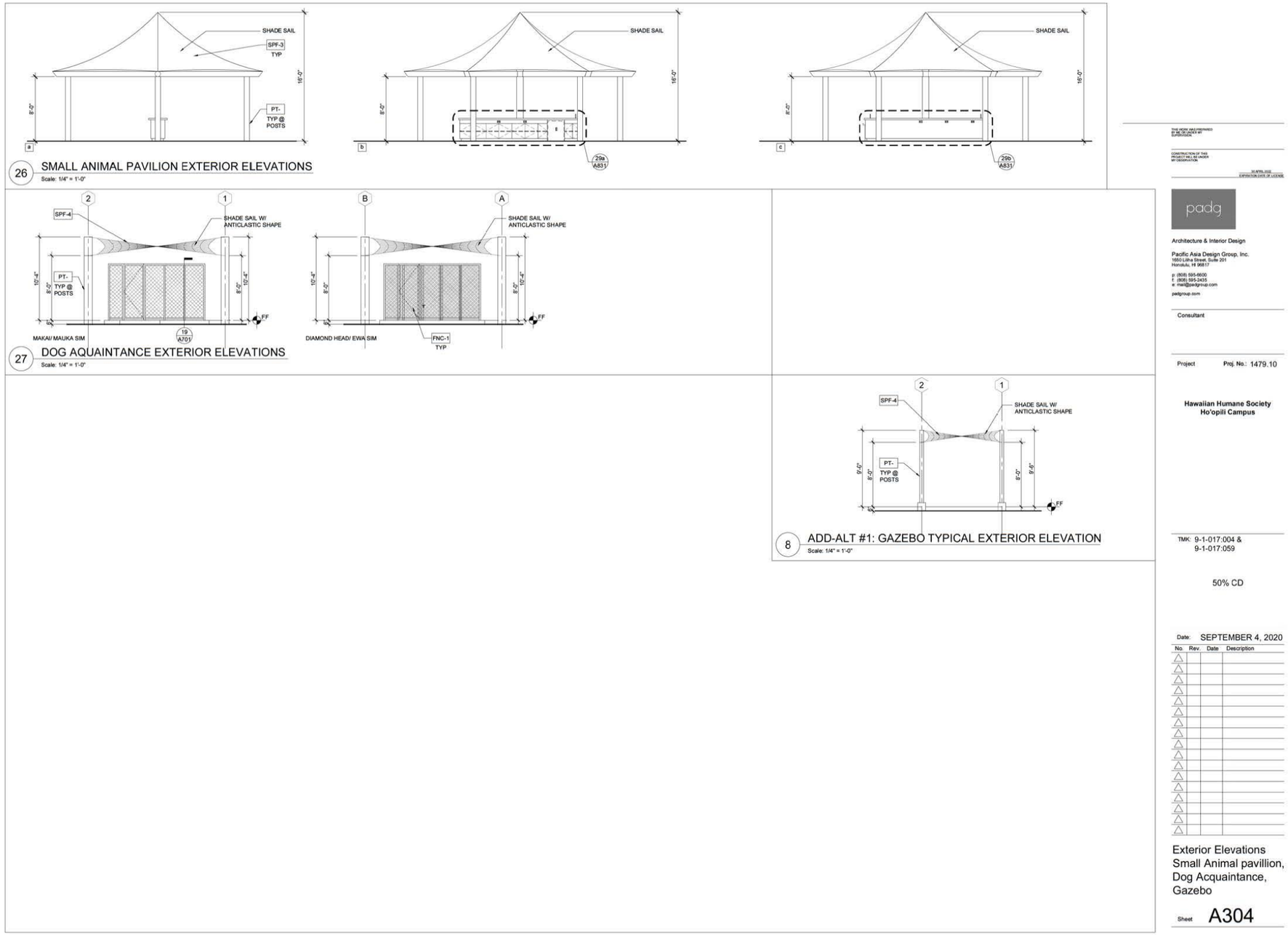
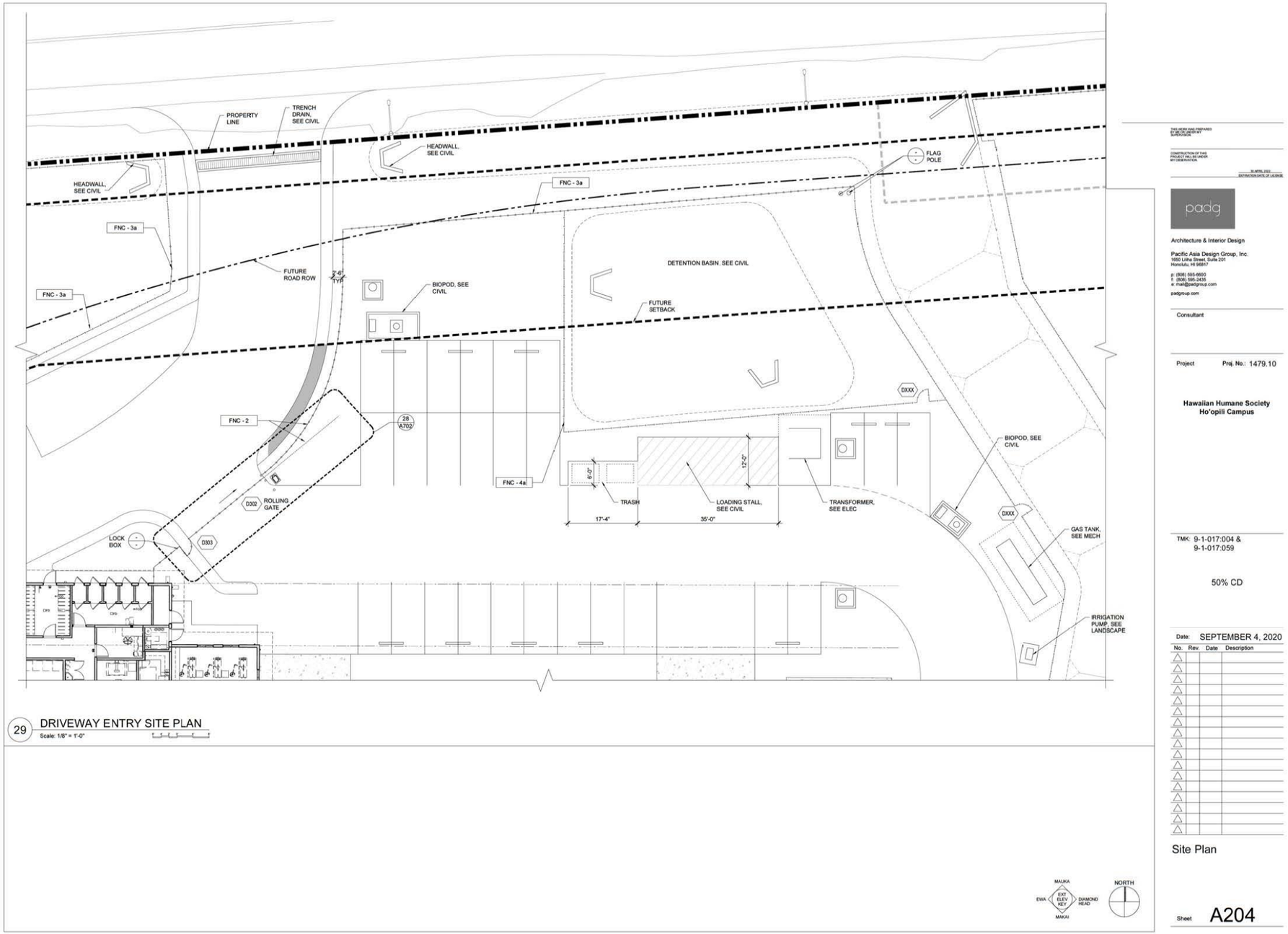


Figure 3-15. Driveway Entry Site Plan



3.2 Construction Activities

Minor construction-related traffic, noise, and air quality (dust) disturbances are anticipated. Construction equipment used for this project may include but are not limited to: loaders, bulldozers, dump trucks, loader-backhoe, trencher, grader, water trucks, concrete hauler pumper, and flatbed trucks. The contractor will be required to observe and comply with all Federal, State, and local laws required for the protection of public health, safety, and the environment.

The contractor will prepare a Best Management Practices (BMPs) Plan for this project. The BMPs Plan will consist of erosion control measures such as planting or hydromulching grass seedling**,** erecting silt fencing/curtains, berms, and/or other applicable erosion control devices to prevent construction-related soils and silt from mixing with storm water runoff.

Upon the completion of work, areas surrounding the project site that have been affected by construction will be restored as much as practicable to pre-existing conditions. The following will be required:

- All construction-related debris, including excavated material, fill material, and refuse shall be removed from the project site and disposed of properly by the contractor.
- All construction equipment shall be removed from the project site promptly after construction is complete.
- Any temporary modification to existing utilities, such as power or communications lines, shall be repaired to their pre-existing condition.
- Roadways providing access to the site shall be cleared of construction debris and any damage from construction traffic repaired.
- All areas damaged by construction staging shall be restored. Exposed ground areas shall be seeded or hydromulched as appropriate.
- Temporary utility lines will be removed from the site and all surplus excavation material and construction debris will be removed and disposed of off-site in compliance with applicable State and County regulations.

3.3 Property Ownership

The subject property is within and a part of an area intended to be developed as a master-planned community commonly known as "Hoʻopili". The Hoʻopili Urban Design Plan (UDP) sets forth concepts, standards, and guidelines intended to shape approximately 1,289 acres of land that comprise the Hoʻopili Master Planned Community and identifies the HHS Hoʻopili project site for business/commercial land use, and designates the site for use by the HHS.

The subject property was deeded[1] on September 28, 2017, by D. R. Horton to the HHS to establish a new HHS campus for the care of animals in the West Oʻahu region. The West Oʻahu Hoʻopili Campus address and tax map key at that time were as follows:

Tax Map Key No.: (1) 9-1-017: 004 and 059 (por.)
Location Address: 91-1945 Fort Weaver Road*

Note: *Civil Engineering Due Diligence Report for Hoʻopili HHS, Bow Engineering & Development, Inc., April 21, 2016.

Since the acquisition of the 2017 deed, the surrounding Hoʻopili Subdivision including the HHS West Oʻahu Hoʻopili Campus project site was subject to subdivision and consolidation. These changes resulted in adjustments to tax map keys and property addresses. The CCH, Department of Budget and Fiscal Services (DBFS), Real Property Assessment Division website was accessed on October 20, 2020, with the following changes for the HHS West Oʻahu Hoʻopili Campus:

Tax Map Key No.: (1) 9-1-181: 042
Location Address: 91-2141 Fort Weaver Road

The project acreage remains unchanged with the lot area identified at 5.473 acres.

A summary of Hoʻopili Master Plan commitments stipulated in the property conveyance documents that are applicable to the HHS land use include:

1. The property shall always be used in connection with the following "Permitted Uses": (1) an animal care facility, which term shall mean and refer to a facility used for the sheltering and care of animals and/or for community education and advocacy services substantially similar to those being offered by other facilities operated by HHS on the Island of Oʻahu and/or other related services and activities that support the operations of HHS, which include but are not limited to animal grooming, animal training, pet supply sales, fundraising and donor activities, and animal day care and boarding; and (2) a community dog park open to the public (the improvements described in (1) and (2) being collectively, the "Facilities").
   The Facilities shall encompass an area of at least one (1) acre; provided, for clarity, that any remaining portion of the property may not be used for any purpose other than the Permitted Uses.

2. The property shall have appropriate fencing and/or barriers around the Facilities, in particular along the Fort Weaver Road frontage, to keep animals from entering the highway, that conforms and complies with all requirements of the State and City and

[1] Deed Between D. R. Horton and Hawaiian Humane Society, September 28, 2017, Perpetual Non-Exclusive Easement, Exhibit C, Depicting a map of Lot 1, consisting of 5.473 Acres, also referred to as Lot B (DPP 2007/ SU-110) (Lot is situated at the corner of Old Fort Weaver Road and Fort Weaver Road, FASP No. S-RS-0760(2).

County of Honolulu Department of Transportation regulations and conditions, including those applicable to any historic or future subdivision of the property.

The construction of the Facilities shall be in accordance with the plans and specifications approved by D. R. Horton, and in substantial compliance with (i) all applicable rules, regulations and requirements of the City and County of Honolulu and the State of Hawai‘i Department of Transportation, and (ii) the applicable rules, regulations, restrictions, architectural standards and design guidelines set out in or adopted pursuant to the urban design plan applicable to Ho'opili.

Section 4
Project Alternatives and Preferred Alternative

4.1 Alternatives to the Proposed Action

Alternatives to the proposed project include: (1) the No Action Alternative; (2) the Delayed Action Alternative; and (3) The Preferred Action Alternative. A description of each is provided below.

4.2 No Action Alternative

The No Action Alternative preserves the status quo. In this scenario, no further action would be taken to develop a second HHS campus in Hoʻopili. The potential for negative adverse environmental impacts associated with construction activities would be adverted and the need for the expenditure of resources for the design and construction of the project would be avoided. The HHS would continue to operate out of their existing space-constrained Mōʻiliʻili campus that is difficult to access for a large percentage of Oahu's population who live in West Oʻahu and other areas outside of Honolulu's urban core. This would result in the possibility of many people and animals being unable to access HHS services.

In the long run, the No Action Alternative would severely impact the ability of the HHS to serve the Secondary Urban Center as described in the CCH's General Plan (CCH. 1992/Amended in 2002) and the `Ewa DP (CCH, 2013). Forecasts of continued population growth of both humans and animals in the district through the year 2025 and beyond will result in an increased demand for HHS services in the region. Taking no further action would therefore result in the continued use of a facility that would become overwhelmed. This would result in HHS being unable to further its mission to promote the human-animal bond and the humane treatment of all animals and maintain improved environments for the animals in its care.

Because the No Action alternative would fail to address the existing and future anticipated demand for HHS services to meet the growing requirements of the island of Oʻahu and the 'Ewa and Central O'ahu DP Areas, it is removed from further consideration.

4.3 Delayed Action

The Delayed Action alternative involves the construction of the project, but at a later date. Delaying the project would temporarily avoid the potential for adverse environmental effects and the need for the expenditure of funds for planning, design, development, and construction activities. However, because the potential for environmental impacts and project costs would only be delayed, impacts and costs associated with the project would eventually be borne when the project is implemented.

Delaying the project to a later time is expected to have virtually the same effect as the No Action alternative:

- Construction costs would be averted in the short-term, but are expected to ultimately be higher due to inflation and other factors while resulting in environmental outcomes similar to the Preferred Alternative of proceeding with the proposed project.
- Delayed Action would also delay the project's implementation schedule for a second HHS campus in West Oʻahu. This delay would fail to address the current and expected demand for HHS services to meet the growing requirements of the island of Oʻahu and the 'Ewa and Central O'ahu DP Areas. This would result in many people and animals being unable to access HHS services at the existing space-constrained Mōʻiliʻili campus and HHS being unable to fulfill its mission.

Because the Delayed Action alternative would fail to accomplish the project objective to provide HHS services to meet the growing requirements of the island of Oʻahu and the 'Ewa and Central O'ahu DP Areas, it is also rejected from further consideration.

4.4 Preferred Alternative

Alternative locations for the proposed project were considered. However, there is the greatest need for HHS services in West Oʻahu. The greatest growth of both human and animal populations in West Oʻahu, facilitated by the CCH ʻEwa DP with a focus on the steady urbanization in the Secondary Urban Center, has resulted in an increased demand for HHS services in the ʻEwa region. Additionally, more than 60 percent of West Oʻahu residents currently have pets and that number is expected to increase over time. As it is already difficult for a large percentage of Oahu's population who live in West Oʻahu and other areas outside of Honolulu's urban core to access the HHS's existing Mōʻiliʻili campus, many are currently unable to access HHS programs, and this is expected to increase with population growth. Additionally, due to the need for a West Oʻahu campus the proposed project site was deeded[2] on September 28, 2017, by D. R. Horton to the HHS to establish a new HHS campus for the care of animals in the West Oʻahu region, as outlined in the Hoʻopili Urban DP. For these reasons, the provision of a second HHS campus at other locations was not pursued further.

Based on the above, the Preferred Alternative is to develop the Hoʻpili HHS campus as described in **Section 3, Project Description, Estimated Construction Cost and Schedule**, of this document. The Preferred Alternative is the only alternative that (1) addresses the existing and future anticipated demand for HHS services to meet growing requirements of the island of Oʻahu and the 'Ewa and Central O'ahu DP Areas; (2) allows HHS to reach a large percentage of Oahu's population who live in West Oʻahu and other areas outside of Honolulu's urban core that may be unable to access the existing Mōʻiliʻili campus; and (3) further its mission to promote the human-animal bond and the humane treatment of all animals and maintain improved environments for the animals in its care.

[2] Deed Between D. R. Horton and Hawaiian Humane Society, September 28, 2017, Perpetual Non-Exclusive Easement, Exhibit C, Depicting a map of Lot 1, consisting of 5.473 Acres, also referred to as Lot B (DPP 2007/ SU-110) (Lot is situated at the corner of Old Fort Weaver Road and Fort Weaver Road, FASP No. S-RS-0760(2).

Section 5
Description of Existing Site Conditions, Potential Impacts, and Proposed Mitigation

This section summarizes the existing environmental setting, potential short and long-term, secondary, and cumulative effects of the proposed project, and mitigation measures. Short-term effects are from construction activities, while long-term effects continue or occur after the project is completed. Although the subject EA document does not require an assessment of impacts according to National Environmental Policy Act (NEPA) requirements, the definition of impacts, according to NEPA, provides guidance toward understanding potential environmental impacts and applicability to this project. Secondary impacts are generally defined as those induced or caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 Code of Federal Regulations [CFR] §§ 1500-1508). Potential cumulative effects may result from the incremental consequences of an action when added to other past, present, and reasonably foreseeable future actions (40 C.F.R. §1508.7).

5.1 Existing Site Conditions

5.1.1 Description

The proposed project involves the construction of a new HHS Hoʻopili campus on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) that falls within the Hoʻopili master-planned community in ʻEwa Beach, Honouliuli Ahupuaʻa, ʻEwa District, Island of Oʻahu, Hawaiʻi. The parcel is undeveloped and heavily overgrown. Currently, the subject property consists mostly of brush (wild vegetation) and fallow rows of taro crops.

Until 2015, diversified agriculture had been cultivated on the property by Fat Law's Farm since 1996. According to Mr. Alvin Law, Director of Development for Fat Law's Farm, the Farm used the property to cultivate vegetables including cucurbit varieties, basil, and taro until approximately 2015, when cultivation ceased in anticipation of the proposed Hoʻopili Master Plan development. There are no buildings or other permanent structures at the site.

Land bordering the HHS site on the west and south are or have been recently in agricultural (cropland) use, on the east is Fort Weaver Road, and on the north is Old Fort Weaver Road. Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into a box culvert northeast of the project site.

5.1.2 Potential Impacts and Proposed Mitigation

The proposed project would have the potential for adverse environmental impacts from short-term construction including grubbing, grading, and construction at the project site. A traffic control plan would be prepared and implemented, as necessary, by the contractor to ensure unimpeded traffic flow through Fort Weaver Road and Old Fort Weaver Road to minimize traffic circulation problems during the period of construction for delivery of construction

materials, access in and out of the site by vehicles, and removal of debris. However, given the relatively undeveloped nature of the surrounding land, no adverse effects are expected.

Because the direct impacts from the proposed action would be only short-term and other past, present, and reasonably foreseeable future actions are expected to be consistent with the existing development and use of the area, the project would make no persistent contribution to secondary impacts.

Overall, the development of the new HHS Hoʻopili campus will help to meet the growing demands for HHS services on Oʻahu and in the growing ʻEwa region. Once constructed, the new Hoʻopili campus will provide core services and accommodate the needs of approximately half the population of the island and work in concert with the existing HHS Mōʻiliʻili campus where the administrative functions will continue to be housed. No negative adverse cumulative effects are expected.

5.2 Climate

5.2.1 Description

The climate in the ʻEwa region is semi-arid with an average low temperature of approximately 67.6 degrees Fahrenheit (°F) in winter and an average high temperature of approximately 84°F in the summer. The average annual rainfall is approximately 17.91 inches per year, with the majority occurring between October and March.

The prevailing wind direction is from the northeast. Northeasterly trade winds prevail over Oʻahu approximately 80% of the time, with average wind speeds ranging from 10 to 15 miles per hour. The trade winds blow most strongly and consistently from April through November. Southerly or "Kona" winds occur roughly less than half the time during December through March.

5.2.2 Potential Impacts and Proposed Mitigation

The development of the proposed project is not expected to have an impact on the region's climate; therefore, no mitigation measures are warranted. **Section 5.7 Natural Hazards** address issues related to climate change.

5.3 Geology and Topography

5.3.1 Description

Geology. The Hawaiian Islands represent the southernmost portion of the Hawaiian Archipelago, a series of northwest-trending ridges produced by a succession of volcanic eruptions during the Pliocene Epoch. The Island of Oʻahu was formed by two shield volcanoes; Koʻolau to the east and the older Waiʻanae, to the west. The volcanoes are believed to have formed during the late tertiary to early Pleistocene periods (MacDonald, Abbott, & Peterson, 1983). The Waiʻanae Volcano erupted between 3.9 and 2.5 million years ago and the Koʻolau Volcano erupted between 2.5 and 1.7 million years ago. The volcanoes are separated by the Schofield Plateau of

central O‘ahu which was formed by lavas of the Ko‘olau Range banking against the older Wai‘anae Range.

The island of O‘ahu is of volcanic origin and was built by the Wai‘anae and the Ko’olau Volcanoes, which are now deeply eroded (MacDonald et al. 1983). The Wai‘anae Range rises 1.2 kilometers above sea level, making it higher than the younger, adjacent Ko’olau Range (MacDonald et al. 1983). The Wai‘anae and Ko’olau Volcanic Shields were built during the late Pliocene and early Pleistocene by thin-bedded lava flows. The main shield building activities ceased approximately 3.5 to 2.5 million years ago (Stearns 1985).

The site is situated on the ‘Ewa Coastal Plain which extends seaward off the southeastern flank of Wai‘anae Volcano and the southwestern flank of the Ko’olau Volcano. This plain was formed by the accumulation of a thick wedge of sediments and coral reef formations on the flanks of the two volcanoes. The project corridor extends across the ‘Ewa Plain, a Pleistocene reef platform overlain by alluvium from the southern end of the Wai‘anae Mountain Range.

Topography. The site is relatively flat with elevations ranging from approximately 18 to 25 feet throughout the parcel. The site is bordered by Fort Weaver Road to the east and the Old Fort Weaver Road to the north. An existing swale runs along Fort Weaver Road.

5.3.2 Potential Impacts and Proposed Mitigation

The proposed project is not expected to adversely impact the geology or topographic nature of the site because it is relatively level. The topography of the site is mostly gently sloping (and highly accessible) and provides adequate slope for drainage. The project will include a drainage detention basin and open spaces (e.g., dog park). Most of the developed areas will be extensively landscaped, which will minimize the potential for soil erosion. Compared to existing conditions in which the land is vacant, the proposed drainage system will provide better control and management of surface runoff during intense storms and from future developments north of the project that is expected to occur over the next 20 years.

Construction of the project may result in soil erosion and is considered a potential short-term construction-related impact. A Grading Permit is required by the CCH Department of Planning and Permitting (DPP) for projects that exceed 50 cubic yards (cy) of grading. The exact excavation and fill quantities will be determined by geotechnical and civil engineers during the project design phase. A Grading Permit from the DPP will be required along with a NPDES permit from the State Department of Health (DOH). All grading operations will be conducted in accordance with dust, erosion control, and other requirements of the CCH’s grading ordinance. Contractors will use BMPs such as employee training, silt fences, and dust control, to minimize erosion during construction and landscaping.

5.4 Water Resources and Hydrology

5.4.1 Surface Water

5.4.1.1 Description

There are no surface waters in the form of stream flows within the proposed project site. In addition, the project area is not subject to contact with a proposed or approved water body segment designated on the State of Hawai‘i 303(d) List of Water Quality Limited Waters. The ‘Ewa Plain serves as a natural drainage way for runoff originating in the mountains of the Wai‘anae Range during rainstorms. This runoff proceeds downgradient through normally dry gulches located mauka of the H-1 Freeway. See **Figure 5-1, Surface Waters.**

There is an existing swale within the project parcel that runs along Fort Weaver Road. According to the U. S. Fish and Wildlife Services (USFWS) National Wetlands Inventory, the swale is classified as a Freshwater Forested/Shrub Wetland habitat (classification code: PSS3C). See **Section 5.6, Wetlands** for further information. The swale discharges into a 7-foot by 3-foot concrete box culvert located north-east of the project site. The box culvert discharges to Honouliuli Stream on the Makai side of Fort Weaver Road. Honouliuli Stream travels through the Makai portion of the West Loch Golf Course and discharges to Pearl Harbor.

General policies of the Hawai‘i DOH Clean Water Branch (CWB) are outlined below. These policies are as follows:

- It is the State’s position that all projects must reduce, reuse, and recycle water to protect, restore, and sustain water quality and beneficial uses of State waters.
- State policy encourages stormwater infiltration through Low Impact Development (LID) practices and discourages the treatment of stormwater as a waste product off impervious surfaces.

This EA recognizes stormwater as a potential source of irrigation, as a source of groundwater recharge and stream base flow, and an asset that sustains and protects natural ecosystems and traditional beneficial uses of State waters.

In addition, the State has a general policy of water quality anti-degradation (HAR, §11-54- 1.1), which states that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In the case that water quality exceeds levels necessary to protect aquatic habitats, water quality may not be degraded without the approval of the director.

The revised CCH, Rules Relating to Storm Drainage Standards, effective June 1, 2013, specifies that regulated new development and redevelopment projects include LID Site Design Strategies, Source Control BMPs and Post-Construction Treatment Control BMPs to meet water quality criteria (CCH Department of Planning and Permitting, 2000, Amended 2012).

Figure 5-1. Surface Waters

5.4.1.2 Potential Impacts and Proposed Mitigation

The proposed project will not impact any stream flows or channels. In addition, the proposed infrastructure will not come into contact with any 303(d) Water Quality Limited Waters, thus will not burden waters that are already impaired.

No impacts to the existing swale that runs along Fort Weaver Road are expected. Additionally, in its comments during preassessment consultation for the project, the U. S. Army Corps of Engineers (USACE) indicated that the swale is not a jurisdictional "Water of the United States (WOUS)". No USACE Department of the Army Permit, CWA, Section 404; Rivers and Harbors Act, Section 10; or DOH Water Quality Certification (WQC), CWA, Section 401, is required.

The project will meet storm water quality requirements of the Rules Relating to Storm Drainage Standards through the use of a detention basin and structural methods. Proposed drainage improvements within the project area include an underground culvert system comprised of two 36-inch diameter pipes and an approximately 25,500 cubic foot on-site detention basin near the north-eastern corner of the project site. The detention basin would be approximately 9,900 sf in area and 3.5 feet high and promote on-site infiltration of surface water and facilitate groundwater recharge.

In its comments during preassessment consultation for the project, the State Department of Transportation, Highways Division, wrote that no additional discharge of surface water run-off onto the State highway right-of-way, drainage culverts, and channels is permitted. The detention basin has been designed to manage and mitigate all additional stormwater runoff from the project site and keep the rate of discharge to the State box culvert located to the north of the project site below existing levels. No additional discharge of surface water run-off would flow onto the State highway right-of-way. The detention basin has been designed and will be maintained for a maximum 48-hour detention period after the design storm and to remain completely dry between storms.

Within the next 20 years, additional development will occur north of the project site including a new roadway. In order to convey future storm water runoff, a 50-foot setback along the northern property line will be reserved for extension of the existing box culvert.

During construction, pollution control measures will be implemented and included in the filing of a NPDES Construction Storm Water Permit, in accordance with CWA regulations. As required a Site-Specific Construction Storm Water BMP will be prepared and followed by the project contractor to handle the treatment of storm water runoff, erosion, and sediment control.

Potential short-term impacts to surface water resources can be avoided. To mitigate construction-related, short-term impacts, BMPs will be incorporated during construction to prevent stormwater discharges and contaminants such as sediment, pollutants, petroleum products, and debris from affecting coastal water quality. This is enforced through compliance with the NPDES. An NPDES permit will be required for construction.

Indirect (non-point), secondary, and cumulative impacts will be avoided with proper management of waste and wastewater, compliance with applicable stormwater regulations, and bioretention through landscaping.

The project will include the following stormwater BMPs:

1) Site Design Strategies
   a) Direct storm water runoff to vegetated and/or landscaped areas.
2) Source Control BMPs
   a) Vegetated and/or landscaped areas shall be incorporated into the drainage design.
   b) Use of an automatic irrigation system designed to minimize runoff of excess irrigation water.
   c) Outdoor trash storage area graded and paved to prevent or control storm water run-on and run-off.
   d) Dumpsters shall be lidded to prevent the entry of stormwater.

Where applicable and feasible, HHS will follow State guidance on Stormwater Impact Assessments (State of Hawai'i Office of Planning, State Coastal Zone Management Program, 2013), Hawai'i Watershed Guidance (State Hawai'i Office of Planning, State Coastal Zone Management Program, 2010), and Low Impact Development (State of Hawai'i Office of Planning, State Coastal Zone Management Program, 2006), including some of the measures discussed above to mitigate impacts to surface water resources.

5.4.2 Groundwater

5.4.2.1 Description

Underlying the property is the 'Ewa Caprock aquifer. The aquifer is designated as a Groundwater Management Area by the State Commission on Water Resource Management (CWRM). The 'Ewa Caprock Aquifer is considered to be a non-potable water resource being of moderate salinity (1,000 to 1,500 milligram per liter chloride [mg/L Cl-]) and vulnerable to contamination. It is an unconfined, brackish basal sedimentary aquifer composed of non-volcanic material, corals, and sediments and is approximately 200 feet thick under the site. Near the southern coast, the caprock thickens to 1,000 feet thick. The direction of groundwater flow below the HHS property is thought to flow seaward in a south, south-west direction.

5.4.2.2 Potential Impacts and Proposed Mitigation

No short- or long-term, secondary, or cumulative adverse impacts to groundwater resources are anticipated during construction or operation of the proposed project, or during the implementation of other past, present, and reasonably foreseeable future actions.

No impacts to groundwater resources are anticipated and Environmental Protection Agency (EPA) and DOH rules and guidelines for project development will be followed.

The protection of the state's underground water sources of drinking water and coastal waters will continue to be regulated through HAR, Title 11, establishing the administrative rules for the State DOH.

5.5 Soils and Potential for Hazardous Materials

5.5.1 Description

According to the U.S. Department of Agriculture (USDA) Soil Survey Geographic database (2001) and soil survey data gathered by Foote et al. (1972), project area soils consist of the Honouliuli series of clay (HxA). Honouliuli Clay is described as "dark reddish-brown, very sticky and very plastic clay throughout" (Foote et al. 1972). See **Figure 5-2, Soil Types**.

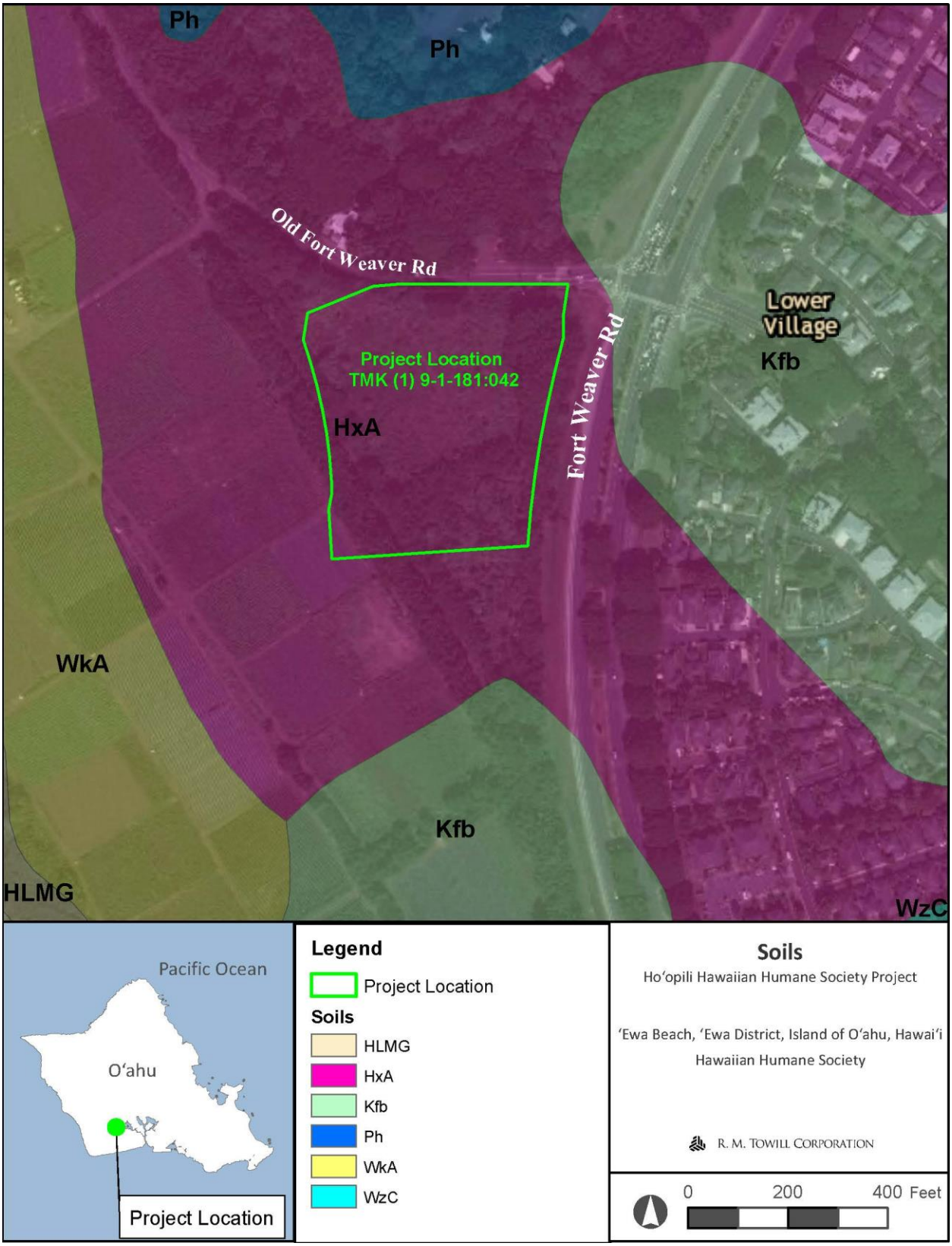
Soils of the Honouliuli Series are described as follows:

> This series consists of well-drained soils on coastal plains on the island of Oʻahu in the ʻEwa area. These soils developed in alluvium derived from basic igneous material. They are nearly level and gently sloping. Elevations range from 15 to 125 feet. The annual rainfall amounts to 18 to 30 inches and occurs mainly between November and April. The mean annual soil temperature is 74° F. Honouliuli soils are geographically associated with ʻEwa, Lualualei, Māmala, and Waialua soils. These soils are used for sugar cane, truck crops, orchards, and pasture. The natural vegetation consists of kiawe, koa haole (*Leucaena leucocephala*), finger grass (*Limnophila aromatica*), bristly foxtail (*Setaria parviflora*), and Bermuda grass (*Cynodon dactylon*). [Foote et al. 1972:43]

The agricultural utility of land in Hawaiʻi was assessed and mapped in the 1970s by the former U.S. Soil Conservation Service in the Agricultural Lands of Importance to the State of Hawaiʻi map series. Three categories of agricultural land were identified in the mapping: Prime, Unique, and Other. Prime Agricultural Land represents the class of greatest importance and Other Agricultural Land the least. The project area is classified as Prime Agricultural Land. In 1972, the University of Hawaiʻi Land Study Bureau developed the Overall Productivity Rating, which classifies soils according to five levels, with A representing the class of highest productivity and E the lowest. The project area contains soils rated B.

Project area soils are highly rated for agricultural production, however, in June 2012, the State of Hawaiʻi Land Use Commission granted reclassification of the 1,280-acres associated with the Hoʻopili development from State Agriculture lands to State Urban lands. A Change of Zoning to residential and business zoning districts was approved in 2015. For the planned Hoʻopili HHS campus, this indicates the majority of the soils surrounding the project alignment have been designated for urban development, regardless of their soil classifications.

Figure 5-2. Soil Types



Potential Hazardous Materials

Potential hazardous materials are not expected to be within the project area and the project is not expected to use hazardous materials.

According to the State of Hawai’i, DOH, Leaking Underground Storage Tank (LUST) list, there are no identified LUST facilities within the project area or in the immediate surroundings.

Until 2015, diversified agriculture had been cultivated on the property by Fat Law’s Farm since 1996. According to Mr. Alvin Law, Director of Development for Fat Law’s Farm, the Farm used the property to cultivate vegetables including cucurbit varieties, basil, and taro until approximately 2015, when cultivation ceased in anticipation of the proposed Ho‘opili Master Plan development. During its occupancy of the property, Fat Law’s Farm used pesticides in farming activities at the subject site. Mr. Law stated that pesticides have always been stored and mixed off-site at the Farm’s warehouse compound to the northwest, and transported to the subject site via tractor.

A Limited Phase II Soil Investigation of the project area was conducted by Malama Environmental in May 2016, respectively. The investigation focused on the subject site's surface soils to address potential pesticide contamination due to historical topical and/or drip line chemical application that likely occurred on the subject site during previous cultivation. The investigation included multi-increment soil sampling, laboratory chemical analysis, and comparison of the analytical results to the State of Hawai‘i Environmental Action Levels (EALs) for Unrestricted Land Use.

Malama Environmental reviewed a list of pesticides applied by Fat Law’s Farm to crops on the property. None of the chemicals used by Fat Law’s Farm were listed in the State of Hawai‘i DOH *Technical Guidance Manual For The Implementation Of The Hawaii State Contingency Plan* (2009), which identifies pesticides known to pose potential direct-exposure hazards and/or leaching hazards at specific concentrations in the environment. The results of the investigation indicated that contaminants of concern were either not detected or present at concentrations much less than the EALs, and therefore there is no environmental concern for unrestricted (e.g., residential) land use at the project site.

A Phase I Environmental Site Assessment of the project area was also conducted by Malama Environmental in March 2020, respectively. The purpose of the Phase I Environmental Site Assessment was for environmental due diligence to identify existing or potential Recognized Environmental Conditions (as defined by ASTM Standard E 1527-13) in connection with the subject property. The results of the assessment found no evidence of any historic or current misuse or significant spills of hazardous or regulated substances on the subject property, and no evidence of recognized environmental conditions or significant environmental concerns in connection with the subject property.

5.5.2 Potential Impacts and Proposed Mitigation

Impacts to the soils include the potential for soil erosion and the generation of dust during grading and construction. Clearing and grubbing activities will temporarily disturb the soil retention values of the existing vegetation and expose soils to erosional forces. Some wind erosion of soils could occur without a proper watering and re-grassing program. Heavy rainfall could also cause erosion of soils within disturbed areas of land. BMPs to minimize impacts may include the following:

- Minimizing the time of construction.
- Retaining existing ground cover as long as possible.
- Constructing drainage control features early.
- Using temporary area sprinklers in non-active construction areas when ground cover is removed.
- Providing a water truck on-site during the construction period to provide for immediate sprinkling, as needed.
- Using temporary berms and cut-off ditches, where needed, for control of erosion.
- Watering graded areas when construction activity for each day has ceased.
- Grassing or planting all cut and fill slopes immediately after grading work has been completed.
- Installing silt fences, sediment traps, and diversion swales, where appropriate.
- Employee training on the proper use of BMPs.

Construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control. Grading activities for the project development will comply with the CCH's grading ordinance. A Grading Permit and a NPDES permit will be required prior to construction to address non-point source discharges. All construction activities will comply with the relevant provisions regulating Fugitive Dust set forth under Section 11-60.1-33, HAR. Proposed LID features will provide better control and management of surface runoff during intense storms. LID is a storm water management strategy that thoughtfully incorporates on-site, natural, storm water control features for the infiltration, evapotranspiration, treatment, and use of rainwater.

All grading materials will be appropriately disposed of in accordance with State and CCH regulations or may be re-used as fill. The contractor will adhere to the DOH, Hazard Evaluation and Emergency Response guidelines for any potential encountered hazardous contaminants or spills.

After construction, landscaping and drainage improvements will provide permanent post-construction pollution control measures and minimize the potential for soil erosion. No long-term impacts on soils are anticipated.

5.6 Wetlands

5.6.1 Description

Wetlands play an integral role in the environment. They prevent erosion in the surrounding area through the presence of wetland associated plants with root systems that hold soil in place. The plants also serve as a physical barrier and absorb energy from waves. Wetlands also provide a natural filtration system for runoff. Nutrients swept into the wetland from runoff are absorbed by plant roots and microorganisms that live in the soil, or stick to the soil particles themselves. Through this process, most of the nutrients and pollution in the water are absorbed and retained and are prevented from entering the ocean (EPA, 2016). Executive Order 11990, Protection of Wetlands, directs federal agencies to take action to minimize the destruction, loss, or degradation of wetlands on their properties and mandates the review of the impact of proposed actions on wetlands through NEPA.

There is an existing swale within the project parcel that runs along Fort Weaver Road. According to the USFWS National Wetlands Inventory, the swale is classified as Freshwater Forested/Shrub Wetland habitat (classification code: PSS3C) (see **Figure 5-3, Wetland Map**).

5.6.2 Potential Impacts and Proposed Mitigation

No impacts to the existing swale classified as Freshwater Forested/Shrub Wetland habitat that runs along Fort Weaver Road are expected.

If water is encountered and removed while digging foundations for the proposed facility, any such discharged water must comply with federal NPDES requirements. During the operation of the proposed project, a BMPs plan and an Erosion Control Plan will be implemented to protect against inadvertent spills or releases of contaminants. **Section 5.4.1.2** addresses preventive measures to be taken by the construction contractor to avoid spills into the swale that runs along Fort Weaver Road, which is the nearest groundwater resource.

No direct, secondary, or cumulative adverse impacts to the area wetlands are anticipated and no further mitigation is anticipated to be required. All work proposed would adhere to regulatory requirements.

5.7 Natural Hazards

5.7.1 Description

The island of O'ahu is susceptible to potential natural hazards, such as hurricanes, tropical storms, high winds, flooding and tsunami inundation, climate change and sea level rise (SLR), earthquakes, and wildfires. The island's unique geographical challenges, aging infrastructure, and fragile logistics system require collaborative efforts to manage complex natural hazard-related issues.

Figure 5-3. Wetland Map

Hurricanes, Tropical Storms, and High Winds. Hurricanes are characterized by strong tropical winds with sustained wind speeds greater than 74 miles per hour and by widespread heavy rains in excess of six inches. Heavy rains may result in destructive flooding and strong winds can produce microbursts and mini-swirls (localized wind bursts that can reach speeds of greater than 200 mph). Hurricanes are classified according to "Category": Category 1 hurricanes have wind speeds between 74 to 95 mph; Category 2 hurricanes have winds between 96 to 110 mph; Category 3 hurricanes have wind speeds of 111 to 129 mph; Category 4 hurricanes have wind speeds from 130 to 156 mph; and, Category 5 hurricanes have wind speeds exceeding 157 mph. The weather associated with hurricanes and tropical storms can lead to storm surges, which is an abnormal rise of water generated by a storm.

Hurricanes occasionally approach the Hawaiian Islands, but rarely reach the islands with hurricane-force wind speeds. The first officially recorded hurricane in Hawaiian waters was Hurricane Hiki in August 1950. Since that time, five hurricanes have caused serious damage in Hawai'i: Nina (1957), Dot (1959), 'Iwa (1982), Estelle (1986), and 'Iniki (1992). It is difficult to predict when these natural occurrences may occur, but it is reasonable to expect that future events will take place and may increase in frequency due to global climate change.

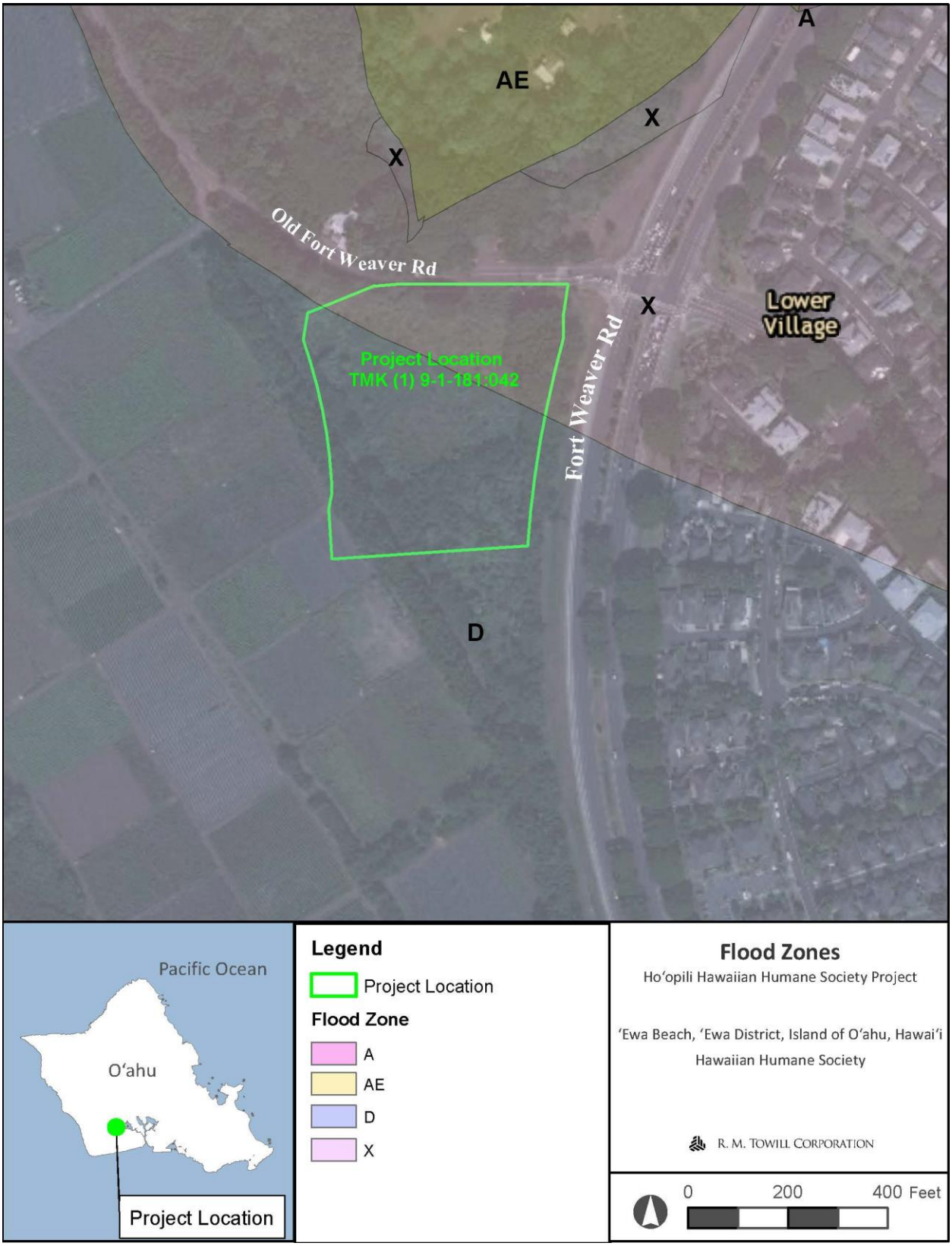
Flooding and Tsunami Inundation. According to the Flood Insurance Rate Maps (FIRM), prepared by the Federal Emergency Management Agency (FEMA), the site is situated within the Flood Zone "D" and "X", and does not fall with a special flood hazard area. Per the FEMA website (see **Figure 5-4, Flood Zones**):

> "The Zone D designation is used for areas where there are possible but undetermined flood hazards. In areas designated as Zone D, no analysis of flood hazards has been conducted. Flood insurance is optional and available, and the flood insurance rates for properties in Zone D are commensurate with the uncertainty of the flood risk."
>
> "The Zone X designation is used for areas of minimal flood hazard. Zone X is the area determined to be outside the 500-year flood and protected by levee from a 100-year flood."

The project is not located within the tsunami evacuation zone or extreme tsunami evacuation zone designated by the Hawai'i State Civil Defense.

Climate Change and Sea Level Rise. Rapid anthropogenic climate change is a well-established fact within the scientific community. As a result of climate change temperatures are rising, stream flows are declining, rain intensity is increasing while total rainfall is declining, oceans are warming and acidifying, ice sheets and glaciers are melting, and sea levels are rising. Rising sea levels and increased intensity of storms will leave developed areas near coastal areas vulnerable to coastal erosion and sea water inundation. Chronic coastal flooding is occurring now, and over the next 30 to 70 years the flooding is expected to increase with SLR, impacting homes and businesses located near the shoreline.

Figure 5-4. Flood Zones



The Hawai‘i Sea Level Rise Vulnerability and Adaptation Report published in December 2017 by the Hawai‘i Climate Change Mitigation and Adaptation Commission provides a basis for recommendations on reducing exposure and increasing adaptability to the impacts of SLR resulting from human-generated greenhouse gas (GHG) emissions. Research within the report notes that the intensity and frequency of natural disasters have increased and provides projections of areas along the coast that are vulnerable to SLR. The report found that for O‘ahu, with no mitigative actions, 3.2 feet of SLR and its associated erosion, flooding, and waves will have significant impacts to the island’s land, building and land values, residents, structures, and major roadways. Rising sea levels will increase the probability of coastal flooding and erosion, which could damage coastal infrastructure. Additional publications from the City Climate Change Commission: Sea Level Rise Guidance and the Climate Change Brief also affirmed that a 3.2-foot SLR scenario by the end of the century is a reasonable benchmark for planning purposes.

The planned project is not located along coastal areas and is outside of the 3.2 feet SLR scenario projections, as indicated in the Hawai‘i Sea Level Rise Viewer (**Figure 5-5, Sea Level Rise Map**).

Seismic Hazards. Earthquakes in the Hawaiian Islands fall into three main categories: volcanic, tectonic, and mantle. The majority of earthquakes in Hawai‘i occur on and around the Island of Hawai‘i, especially in the southern districts of the island where the most active volcanoes in the State – Kilauea, Mauna Loa, and Loihi – are located. The last major earthquake felt on O‘ahu was the Honomu Earthquake in 1973, which resulted in minor cosmetic damage to structures.

The potential impacts of global climate change on earthquake probability are unknown. Secondary impacts of earthquakes could be magnified by climate change, as rising air temperatures facilitate soil breakdown and intense rainstorms cause greater erosion or greater susceptibility to infrastructure failure.

Wildfires. The Hawaiian Islands are vulnerable to wildland fires, especially during the summer months from prolonged drought and/or high winds. The greatest danger of fire is where developed, urbanized areas border densely vegetated areas. Overgrown vegetation close to homes, pockets of open space within subdivisions, and an increase of non-native high fire-intensity plants around developed areas pose increasing threats to commercial, community, environmental, and residential resources. A great majority of wildfires are human-caused (intentionally caused or by negligence) and often start along roadsides. Wildfires can and do also occur naturally.

5.7.2 Potential Impacts and Proposed Mitigation

The proposed project will not increase risks to human health or result in property damage due to natural hazards, as discussed below.

Figure 5-5. Sea Level Rise Map

Hurricanes, Tropical Storms, and High Winds. The effects of past storm events have caused minimal to no damage to the project area. The future threat of hurricanes to the island cannot be calculated, although the frequency of hurricane threats may increase with climate change and warming ocean waters, and the resulting rise in sea level. While waves generated by these storm events can cause coastal erosion and flooding, the project area is not located adjacent to coastal areas. If a hurricane, tropical storm, or high winds occur during construction, activities would cease, and equipment will be secured in work areas. Construction of the project will be designed to meet all applicable building code requirements.

Flooding and Tsunami Inundation. Tsunami conditions impose no constraints on the planned project. The project area is located in Flood Zone D and X. Flood Zone D is defined as an undetermined flood hazard area. Typically, the CCH requires a flood determination study for projects located in Zone D if there is an adjacent stream or channel. Within the project parcel, a swale/old irrigation ditch runs along the east portion of the site and does not appear to be conveying much storm runoff. It was confirmed with the Honolulu Floodplain Manager (Mario Siu-Li) that no flood determination study would be required for the project (Hoʻopili HHS Due Diligence Report, 2016). Flood Zone X includes areas of minimal hazard from the principal source of flood in the area, and the Flood Insurance Program does not have regulations for development within this district.

Climate Change and Sea Level Rise. Climate change and SLR, and associated coastal impacts are a concern for the State of Hawaiʻi and the world, requiring a global response. Construction of the project would not result or constitute a source of impact to the climate of the region. The project area is furthermore located outside of a modeled 3.2 feet sea level rise inundation zone as defined by the Sea Level Rise Exposure Area. The project design will include the installation of LID improvements and BMPs where practical and feasible to improve surface and ground water quality and manage storm water quantity. The planned project will maximize pervious and landscaped areas within the site to the extent practicable. A detention basin will be utilized for LID. As a result, storm runoff will be detained onsite to attenuate the peak runoff flow.

Seismic Hazards. Construction of the planned project is not expected to be adversely affected by seismic activity as the proposed HHS Hoʻopili campus would be constructed for a long-term design life in accordance with the Uniform and International Building Codes and other County, State, and Federal standards, which provide minimum design criteria to address the potential for damage due to seismic disturbances.

Wildfires. The project area will develop a parcel consisting of overgrown vegetation. Construction and long-term operation of the planned project are not expected to be adversely affected by wildfires. No adverse impacts are expected, and no mitigation measures are required.

5.8 Flora and Fauna

The biological communities of potential concern in the project area are floral and faunal organisms. Several specific technical studies were prepared for the proposed Ho‘opili project. These studies are included as appendices to the EA and include:

- Flora Survey (LeGrande Biological Surveys Inc.) (**Appendix B**)
- Faunal Survey (Rana Productions, Ltd.) (**Appendix C**)
- Arthropod Survey (Pacific Analytics, L.L.C.) (**Appendix D**)

5.8.1 Terrestrial Flora

5.8.1.1 Description

A botanical resources survey of the project area was conducted by LeGrande Biological Surveys, Inc., in January, May, and August 2006. The primary objectives of the study were to: 1) prepare a general description of the vegetation on the project area; 2) provide an inventory of the flora; and 3) search for and identify threatened and endangered species as well as species of concern. This report is included in **Appendix B**.

According to the botanical survey report, the majority of the project area has been plowed and is devoid of trees and brush. Other lands within the project area are uncultivated brushland/or pastureland. The vegetation is typical of agriculturally cultivated cropland/or highly disturbed weedy areas. Little of the original native vegetation remains after over a century of intensive agriculture and periodic burning. Native species have been replaced by aggressive non-native plant species. No federally listed endangered or threatened native plants, or candidate endangered species, were encountered on the property.

In its comments during preassessment consultation for the project, the Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) wrote that it recommends minimizing the movement of plant or soil material, such as fill, between worksites. Soil and plant material may contain invasive fungal pathogens, vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. DOFAW also recommended consulting the O'ahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

5.8.1.2 Potential Impacts and Proposed Mitigation

Development of the proposed Ho‘opili HHS project will not impact any endangered, threatened, or otherwise protected plant species as none are known to be present at the site. Native and indigenous vegetation will be considered in the selection of plant materials for landscaping. During construction, the movement of plant or soil material between worksites will be minimized, where possible, and all equipment, materials, and personnel should be cleaned of

excess soil and debris to mitigate the spread of any high-risk invasive species in the area. The proposed project will not result in significant adverse secondary or cumulative impacts to flora resources.

5.8.2 Terrestrial Fauna

5.8.2.1 Description

A faunal resources survey of the project area was conducted by Rana Productions, Ltd., in July, August, and September 2006 (see **Appendix C**). The primary objectives of the study were to: 1) prepare a general description of the project area; 2) to determine if there were any avian or mammalian species currently listed as endangered, threatened, or proposed for listing under either Federal or State of Hawai'i endangered species statutes; and 3) provide information on the relative abundance of avian species within the various parcels.

Mammalian surveys using both direct visual or auditory and detection of indirect evidence (tracks, scat, or sign) revealed only alien species, including house mouse (*Mus musculus domesticus*), dog (*Canis f. familiaris*), mongoose (*Herpestes a. auropunctatus*), horse (*Equus c. caballus*) and cat (*Felis catus*). The lone listed terrestrial mammalian species, the Hawaiian Hoary Bat or 'Ope'ape'a (*Lasiurus cinereus semotus*) was not detected during the faunal surveys. In its comments during preassessment consultation for the project, however, the DLNR, DOFAW wrote that the State listed Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. Therefore, site clearing should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.

Twenty-four avian species were recorded during the survey of the main parcels, including two indigenous migratory shorebird species, the Pacific Golden Plover (*Pluvialis fulva*) and Ruddy Turnstone (*Arenaria interpres*). The remaining 22 species are alien and include pheasants, partridges, herons, pigeons and doves, bulbuls, larks, starlings, sparrows, mockingbirds, and finches.

In its comments during preassessment consultation for the project, DLNR, DOFAW, wrote that State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*) and Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, the O'ahu DOFAW Office should be contacted at (808) 973-9778.

DOFAW also noted that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW

recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15 when young seabirds take their maiden voyage to the open sea.

While not observed during the survey, the Short-Eared Owl, or Pueo (*Asio fammeus sandwichensis*), is known to exist in the ʻEwa region and may be present in the area. The State of Hawaiʻi lists the Oʻahu population of the Pueo as an endangered species, while the federal statute does not. In its comments during preassessment consultation for the project, DLNR, DOFAW, wrote that Pueo are a crepuscular species, most active during dawn and dusk twilights. DOFAW recommends twilight pre-construction surveys by a qualified biologist prior to clearing vegetation. If pueo nests are present, a buffer zone should be established in which no clearing occurs until nesting ceases, and DOFAW staff should be notified.

A survey of arthropods on the project area was conducted in May 2008 by Dr. Gregory Brenner of Pacific Analytics, L.L.C. The primary objectives of the survey were to: 1) provide a general description of the arthropod fauna of the project area; 2) evaluate the habitats (if any); and 3) search and assess the potential for threatened or endangered arthropod species as well as species of concern. According to Dr. Brenner, the arthropod species that were collected during the study would be considered typical of what would be found in lowland sites with little or no native vegetation and disturbed by agricultural operations. No species found were locally unique to the site. A copy of the assessment is attached as **Appendix D**.

There is no expected deleterious effect on faunal species from the proposed project development. The site does not contain any unique habitat, and any modification will have no deleterious impact on any species currently listed as endangered or threatened, or proposed for listing under either the federal or state endangered species statutes.

5.8.2.2 Potential Impacts and Proposed Mitigation

Development of the proposed Hoʻopili HHS project is expected to have no negative adverse impacts to native fauna species or their habitat, as the site does not currently provide desirable habitat to native, threatened, or endangered species.

The mammalian and avian species currently found within the project area are by and large alien species. All of the mammalian species identified are alien and only three of the avian species present are indigenous. The endangered Hawaiian Hoary Bat was not detected during the faunal surveys, however, DOFAW indicated that the Hawaiian Hoary Bat has the potential to occur in the vicinity of the project area and may roost in nearby trees. State-listed waterbirds and seabirds have the potential to occur in the vicinity of the proposed project site. Also, the Pueo is known to exist in the ʻEwa region and may be present in the area.

The results of the arthropod survey indicate that there are no special concerns or constraints related to invertebrate resources in the project area.

The majority of the project area is land formerly cultivated, having led to high degrees of disturbance or destruction of native habitat. Current habitats are deemed “depauperate” (severely diminished) by the biological consultant.

Based on the above, impacts to the mammalian, avian, and invertebrate species and their habitats are expected to be minimal. Disturbance and displacement of individual alien species is likely to occur as construction takes place. The disturbance will be of a temporary nature. Once constructed, methods (e.g., bait stations, covered trash receptacles, etc.) will be taken to ensure vulnerable birds or predators are not attracted to the site.

The proposed HHS Ho‘opili Campus is approximately 3.28 miles from the property boundary of Kalaeloa Airport. To ensure that no wildlife that could potentially impact airport aircraft operations are attracted to the proposed detention basin, the basin will only temporarily store stormwater runoff. The stormwater detention basin will be designed, engineered, constructed, and maintained for a maximum 48-hour detention period after the design storm and will remain completely dry between storms. A perforated riser will be located within the basin that will allow for water to flow out over the span of 48 hours. Standing water will be avoided. Based on this, the detention basin is not expected to attract wildlife.

To ensure all prudent and precautionary measures are observed, the following steps are recommended during construction:

- Site clearing should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.

- If any State listed waterbird species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, the O'ahu DOFAW Office should be contacted at (808) 973-9778.

- Prior to the start of grubbing/grading, a qualified biologist should complete a survey of the area to be disturbed to be sure that no nesting pueo are present. In the event that a nest is located, a buffer zone should be established in which no clearing occurs until nesting ceases, and DOFAW staff should be notified.

- If construction activity is to be undertaken after sunset, all associated lights should be well-shielded, and where large flood/work lights are used, these should be placed on poles that are high enough to allow the lights to be pointed directly downward. As possible, night-time work during the peak of seabird fallout between September 15 and December 15 should be avoided to minimize adverse impacts to listed seabird species that might overfly the project vicinity.

5.9 Noise Conditions

5.9.1 Description

Existing sound levels in the vicinity of the Ho‘opili HHS site are fairly high due to traffic generated by Fort Weaver Road and Old Fort Weaver Road. The swale, located on the eastern edge of the proposed site, forms a natural barrier between the site and Fort Weaver Road. The dominant noise sources are traffic, birds, wind, occasional distant aircraft flyovers, and farm equipment.

Aircraft activity in the vicinity of the ‘Ewa area generated from the Kalaeloa Airport and Daniel K. Inouye International Airport may be audible at the Ho‘opili HHS project site. In its comments during preassessment consultation for the project, the State Department of Transportation wrote that single-event noise may occur from potential overflights of aircraft or under certain weather/atmospheric conditions, particularly from aircraft approaching or departing Kalaeloa Airport. However, the overflights of aircraft are infrequent and the Ho‘opili HHS project site is located well outside of the 55 DNL (Day-Night Average Sound Level) noise contours for both airports. Even when no aircraft is flying near the project area, noise is generated by traffic on adjacent roadways, including Fort Weaver Road and Old Fort Weaver Road. Wind through vegetation and birds also generate noise within the project area.

5.9.2 Potential Impacts and Proposed Mitigation

Construction activities will temporarily affect sound levels, and therefore may have an impact on neighboring properties. These impacts are unavoidable but will be temporary. North and west of the project area, surrounding lands consist mostly of formerly cultivated land and a golf course that is considered to be open space. Most businesses in the area are located far enough away that they would not be impacted. West Loch Fairways neighborhood is located to the east of the project area across Fort Weaver Road and some residences located to the north of the project area across Old Fort Weaver Road, therefore construction noise is not expected to have a significant impact. However, as necessary, contractors will employ mitigation measures to minimize temporary impacts associated with noise including the use of mufflers and implementing construction curfew periods.

Pursuant to HAR, Chapter 11-46, construction activities will comply with all community noise controls. The DOH Community Noise Rule specifies that industrial areas may not exceed the “maximum permissible” noise level of 70 A-weighted decibels during both day and night. In cases where the construction sound level exceeds or is expected to exceed the DOH’s “maximum permissible” noise levels at the property line, the contractor will obtain a noise permit from the DOH to operate vehicles, construction equipment, and power tools that emit noise levels in excess of “maximum permissible” levels.

Aircraft noise due to operations at nearby Kalaeloa Airport and Daniel K. Inouye International Airport may be audible at the project site. However, flights directly above the site are infrequent and the project site is outside of the 55 DNL (Day-Night Average Sound Level) noise contours for both airports. Therefore, a significant noise impact due to aircraft noise is not expected.

5.10 Air Quality

5.10.1 Description

The DOH, Clean Air Branch (CAB) has identified the following four potential sources of air pollution in the vicinity of the proposed project: (1) industrial sources, such as power plants and refineries, (2) mobile sources, such as motor vehicles, (3) agricultural sources, such as cane burning (no longer practiced with the demise of the sugar industry on O‘ahu), and (4) natural sources, such as wind-generated dust and volcanic activity (DOH, 2013, 2014b, 2015b).

Air quality at and surrounding the project site is generally excellent year-round. The prevailing northeasterly trade winds tend to push any human-made or natural pollutants out to sea. During intermittent periods Kona winds can carry “vog” (volcano-associated gasses) toward O‘ahu and the surrounding islands leading to an increase in volcanic air pollutants and a decrease in visibility.

The DOH Air Quality Monitoring Kapolei Station is located in the vicinity of the site. According to the State of Hawai‘i Annual Summary 2018 Air Quality Data, levels of $PM_{2.5}$, PM_{10}, carbon monoxide (CO), sulfur dioxide (SO_2), ozone (O_3), nitrogen dioxide (NO_2), and lead (Pb) at the Kapolei Station remain below state and federal ambient air quality standards, indicating generally good air quality.

5.10.2 Potential Impacts and Proposed Mitigation

No long-term impacts to air quality are anticipated. Short-term impacts from emission of fugitive dust will likely occur during site preparation and construction. An effective dust control plan will be implemented as necessary. All construction activities will comply with the provisions of HAR, Section 11-60.1-33, related to Fugitive Dust.

Measures to control dust during various phases of construction may include:

- Providing an adequate water source at the site prior to start-up construction activities;
- Irrigating the construction site during periods of drought or high winds;
- Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase;
- Disturbing only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion;
- Providing adequate dust control measures during weekends, after hours, and before daily start-up of construction activities;
- Installing dust screening in the areas of disturbance; and
- Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

5.11 Visual Resources

5.11.1 Description

The Ho‘opili HHS site is surrounded by Old Fort Weaver Road to the north, Fort Weaver Road to the south and east, and open space to the west. Significant views and vistas in the project vicinity identified in the ‘Ewa DP include the following:

- Distant vistas of the shoreline from the H-1 Freeway above the ‘Ewa Plain;
- Views of the ocean from Farrington Highway between Kahe Point and the boundary of the Wai‘anae DP Area;
- Views of the Wai‘anae Range from H-1 Freeway between Kunia Road and Kalo‘i Gulch and from Kunia Road;
- Views of Na Pu‘u at Kapolei, Palailai, and Makakilo;
- Mauka and makai views; and
- Views of central Honolulu and Diamond Head, particularly from Pu‘u O Kapolei, Pu‘u Palailai, and Pu‘u Makakilo.

5.11.2 Potential Impacts and Proposed Mitigation

The Ho‘opili HHS project site is not currently situated in an area that would obstruct any panoramic views identified in the ‘Ewa DP. The proposed project would not be visible from the H-1 Freeway and would not block makai views of the shoreline or mauka views of the Wai‘anae Range. While the proposed facility would be visible from the portions of Old Fort Weaver Road and Fort Weaver Road fronting the proposed site it would not obstruct important viewsheds. Landscaping consisting of screening trees would be planted to mitigate visual impacts from Old Fort Weaver Road and Fort Weaver Road.

In the future, the ‘Ewa DP will bring development up to the proposed site. Panoramic views from this future development are not expected to be impacted by the project.

To avoid attracting endangered, night-flying seabirds, lighting used during construction would be shielded and downward facing, which will also serve to minimize any visual obtrusiveness of the site to surrounding properties. No significant visual impacts are expected to result from this project.

5.12 Socio-Economic Environment and Demographics

5.12.1 Description

Population and Demographics. There is currently no residential population or dedicated employees on the project area. The project area is located in the Kunia West Census Tract. **Table 5-1** shows population and demographic information for the State, Island of O‘ahu, the ‘Ewa DP

area which includes 23 census tracts (including the Kunia West Census Tract), and the Kunia West Census Tract within which the project is physically located.

Hawaiʻi is unique among other states in the U.S. as no single race comprises the majority of the population. According to the 2018 Census Data, "Asian" comprised the largest population in the State at 37.8% of the population, which represented 46.3% of the population within the ʻEwa DP area. In the ʻEwa DP area, "Two or More Races" was the second largest ethnic group represented at 25.4%, with "White" was the third largest ethnic group at 16.6%. The median age in the ʻEwa DP area and the project area census tracts was 36.1 years old. This is slightly lower than the Statewide median age of 38.9 years old.

Table 5-1. Population and Demographics

2018 Census	State of Hawaiʻi	Oʻahu	ʻEwa DP Area (23 Tracts)	Kunia West
Population	1,422,029	987,638	344,887	10,583
Ethnicity				
White	25%	21.0%	16.6%	20.2%
African American	1.8%	2.4%	2.7%	7.1%
American Indian/Alaskan Native	0.2%	0.2%	0.1%	0%
Asian	37.8%	42.5%	46.3%	33.7%
Japanese	12.1%	14.0%	12.8%	4.3%
Filipino	15.1%	15.1%	23.6%	21.0%
Chinese	4.0%	5.2%	2.3%	3.1%
Native Hawaiian/Other Pacific Island	10.1%	9.5%	8.1%	7.2%
Native Hawaiian	6.3%	5.1%	3.8%	6.4%
Other	1.1%	0.9%	0.9%	0.4%
Two or More Races 35.5%	24.0%	23.5%	25.4%	31.3%
Age				
Under 5 Years	6.4%	6.5%	7.0%	8.3%
5-19 Years 25.6%	17.3%	17.1%	18.8%	24.2%
20-64 Years	59.0%	59.5%	59.5%	57.5%
65 or More Years	17.3%	16.8%	14.7%	9.9%
Median Age (Years)	38.9	37.6	36.1*	33.2

Source: 2018 Census (Sf1)
*Average median age based on median age for 23 tracts making up ʻEwa DP Area

Income and Employment. Statewide in 2018, approximately 9.9% of individuals earned an income below the poverty level. Within the Kunia West Census Tract (2018), the percentage of individuals earning below the poverty level was only 6.1%, respectively. The median statewide household income was approximately $78,084 (2018). The median income in the Kunia West Census Tract where the project area is located was $93,906. The percentage of individuals utilizing Social Security income was higher within the ʻEwa DP and project area census tract in comparison to Oʻahu and the State overall. In 2018, the unemployment level was about 4.5% island-wide. The unemployment rate within the ʻEwa DP is 3.8% which was lower than unemployment rates within the Kunia West Census Tract at 4.3%.

Housing. Of the 103,303 housing units in the ʻEwa DP area, 65.7% of these units are owner-occupied. This is higher than the state-wide and island-wide average of owner-occupied units which is roughly 58.3% and 55.8%, respectively. Approximately 53% of structures within the project area census tract were constructed prior to 2000, with another approximately 38% constructed after 2000.

According to the Oʻahu General Plan, ʻEwa and the Primary Urban Center are the two areas of Oʻahu where population growth and development activity will be directed through 2025. ʻEwa is intended to accommodate 13% of the island's population as Oahu's Second City, the focus of major economic activity, housing development, and government services (CCH Department of Planning and Permitting, 2013).

5.12.2 Potential Impacts and Proposed Mitigation

The planned project will not directly result in significant adverse impacts to socio-economic characteristics within the project vicinity, including population, income, and housing. The proposed project will provide beneficial impacts to the rapidly growing population of ʻEwa by offering core services and accommodating the needs of approximately half the population of Oʻahu in the area of animal admissions, adoptions, field services, lost and found, care and holding, and sterilization surgeries.

With the populations of both humans and animals in West Oʻahu growing, facilitated by the CCH ʻEwa DP with a focus on the steady urbanization in the Secondary Urban Center, there is an increased demand for HHS services in the ʻEwa region. More than 60 percent of West Oʻahu residents currently have pets and that number is expected to increase over time. Additionally, the existing Mōʻiliʻili campus is difficult to access for a large percentage of Oahu's population who live in West Oʻahu and other areas outside of Honolulu's urban core. Therefore, people who may need HHS services currently find it too inconvenient or are simply unable to access them. To meet the growing demands HHS proposes to construct a second site in Hoʻopili. Once constructed, the proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mōʻiliʻili campus where the administrative functions will continue to be housed.

In the short term, construction expenditures associated with the proposed project will have a beneficial impact on the local construction industry, and construction activities will benefit the community indirectly through the creation of jobs.

Implementation of the proposed project will result in potential secondary impacts by stimulating local business enterprises and increasing local employment. The combined increased business activities will result in increased state revenues, in the form of excise, individual, and corporate taxes. Combined with other past, present, and reasonably foreseeable future actions the proposed project would support the local economy and anticipated increased area population of both animals and humans. Because population growth on Oʻahu is anticipated to occur with or without the implementation of the proposed project no significant adverse cumulative impacts to the socio-economic environment are anticipated.

5.13 Public Facilities and Services

5.13.1 Roads and Transportation

5.13.1.1 Description

A traffic impact assessment is currently underway for the proposed project and will be included in the Final EA. HHS will continue to coordinate the project with the CCH, Department of Transportation Services, Regional Planning Branch, and the State Department of Transportation. Based on the limited scope and scale of the project no adverse traffic impacts to the local and regional roadway system are expected.

The following provides a brief discussion of the existing regional roadway network in the vicinity of the project area.

Fort Weaver Road (State-owned/maintained). This roadway extends north-south, connecting the H-1 Freeway with the Farrington Highway. North of Farrington Highway, Fort Weaver Road becomes Kunia Road. Fort Weaver Road serves as a six-lane expressway between the H-1 Freeway and Iroquois Road. The roadway continues south from its crossing of Iroquois Road as a four-lane main arterial roadway with a median divider and left-turn lanes. Paved pedestrian and bicycle facilities are present.

Old Fort Weaver Road (City-owned/maintained). This roadway is classified as an Urban Minor Collector. It provides access to residential land uses by an east loop intersection and a west loop intersection with Farrington. Old Fort Weaver Road is a two-lane undivided roadway at both loop intersections without paved shoulders or pedestrian and bicycle facilities.

TheBus passes through the Hoʻopili area along Old Fort Weaver Road, Fort Weaver Road, and Farrington Highway and transit nodes and corridors are located nearby. In addition to TheBus express routes, the Leeward Oʻahu Transportation Management Association also sponsors an express bus service along Fort Weaver Road to Honolulu with one morning and one afternoon trip.

The CCH is constructing a high-capacity transit corridor project between Kapolei and the University of Hawaiʻi at Manoa. The nearest station to the HHS Hoʻopili campus will be the Honouliuli Station.

5.13.1.2 Potential Impacts and Proposed Mitigation

Access to the Hoʻopili HHS campus will be via an interim driveway constructed off Old Fort Weaver Road along the northern side of the project site. An interim driveway will be constructed rather than a permanent one because Old Fort Weaver Road will be removed and realigned as part of the Hoʻopili Master Plan. The interim driveway and future driveway plans will be designed to comply with CCH regulations.

According to the DPP, Traffic Review Branch (TRB), the following regulations shall apply:

1. All driveways should be perpendicular to CCH roadways with a minimum driveway width of 20-feet (24-feet recommended) and a maximum driveway slope of 5% (less is recommended).
2. Temporary driveways can remain for the future condition as a secondary access, but turn movements would be limited to right in, right out (no left turns).
3. Future driveway would allow all turn movements (i.e. right in/right out & left in/left out).
4. Future driveway connection to be as far away from Old Fort Weaver Road intersection as possible to avoid double right turn lanes.

According to the Ho'opili traffic engineer (Austin Tsustumi & Associates), a left turn pocket lane for the interim driveway is not expected to be necessary due to the "relatively light" traffic along Old Fort Weaver Road. However, if the CCH requires an additional turn lane, this will require that the makai side of Old Fort Weaver Road be widened slightly.

The existing utility poles near the intersection are within 6.5 feet of the travel lane. According to the American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guidelines, the clear zone requirement is 7 to 10 feet from the edge of the travel lane. Therefore, the CCH may require two utility poles to be relocated outside the clear zone, outside the right of way, which may require an easement. The HHS will continue to work with the DPP, TRB, to determine the required offsite improvements for the interim condition.

As part of the Ho'opili Master Plan, improvements will be made to Old Fort Weaver Road which includes realignment and widening. A future roadway named Keahumoa Parkway will be constructed along the west portion of the project site, running parallel to Fort Weaver Road. At that time, a future driveway to access the Ho'opili HHS campus may be constructed along Keahumoa Parkway and will be designed to comply with CCH regulations. Keahumoa Parkway will meet up with a segment of the realigned Old Fort Weaver Road at a new intersection. These improvements are part of Phase IV of the Ho'opili Master Plan which may not occur for another 20 years.

The major source of disturbance to traffic is anticipated from the delivery of construction materials and the transit of vehicles carrying workers to and from the job site. Occasional increases in construction traffic may result from the periodic movement of vehicles to and from the job site for the disposal of demolition debris. These impacts however will be short-term in duration, of relatively low scope and scale, and will cease with the completion of the project. Mitigative measures will include the planning of construction activities during the daytime hours with no night work anticipated to be required, and the use of flagmen and/or traffic controls to maintain accessibility for businesses and residents who may use the surrounding area roads.

As required, a Traffic Management Plan (TMP) including BMP controls and ADA compliance requirements would be prepared for review and approval by appropriate State and CCH agencies, including the Department of Transportation Services and DPP. The TMP would be implemented

by the contractor to ensure unimpeded traffic flow through Old Fort Weaver Road to minimize traffic circulation problems. Any damage to State and CCH-owned roadways caused by the project would be repaired to current standards as well as meet ADA requirements. Project plans (interior and exterior layouts, vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) would be reviewed and approved by the Disability and Communication Access Board to ensure full compliance with the ADA. The contractor would obtain a street usage permit from the Department of Transportation Services for any construction-related work that may require temporary closure of any traffic lane on Old Fort Weaver Road (CCH-owned street). HHS and its contractor would continue to appraise the ʻEwa Neighborhood Board No. 23, area businesses and schools, emergency services, and Oʻahu Transit Services of its construction plans, schedule, and any changes throughout the project planning and implementation process.

During preassessment consultation for the project, the State Department of Transportation, Highways Division, provided a letter dated November 19, 2020, stating that it provided comments on the subdivision application 2016/Sub-44 (July 20, 2016, HWY-PS 2.2781) for the project site. In summary, the Department of Transportation, Highways Division, did not anticipate the subdivision or HHS use of the parcel would significantly impact State highways, subject to the following conditions:

1. HSS coordinates with the State Department of Transportation, Highways Division, with respect to necessary permits and approvals for sidewalks and other improvements that would affect the State right-of-way.
2. HSS provides a fence or appropriate barrier around their facility, in particular along the Fort Weaver Road frontage, to keep animals from entering the State highway.
3. No additional discharge of surface water run-off onto the State highway right-of-way, drainage culverts, and channels is permitted.

No work is proposed in the State right-of-way, however, there is some work within a State easement. A fence will be provided around the facility and along Fort Weaver Road frontage, to keep animals from entering the State highway. A detention basin is proposed along the north-east corner of the development and would capture and control discharges from the proposed project into the 7 feet by 3 feet State box culvert located to the north of the project site. All additional stormwater runoff from the project site will be managed and mitigated onsite and the rate of discharge kept below the existing rate into the State box culvert. No additional discharge of surface water run-off would flow onto the State highway right-of-way. Plans were submitted to the State Department of Transportation, Highways Division, for review in December 2020.

Following construction, the project is not expected to have long-term adverse effects on public roadways or traffic. The project is being constructed in the Hoʻopili Master Planned Community which has been designed to be walkable/bikeable and transit-ready to reduce traffic impacts. Once fully constructed, the Hoʻopili community will include transit-oriented development, bus lines, wider streets, and increased connectivity to encourage pedestrian and bicycle movement and use of rapid transit and buses. The proposed project is not expected to substantially increase the walking, biking, or transit demand to a level where it could not be accommodated by existing

or planned facilities, nor is it expected to conflict with any existing or planned facilities or improvements. Project plans for the new Hoʻopili HHS campus will be submitted to the Department of Transportation Services, Transportation Mobility Division, for review and approval.

The new Hoʻopili HHS campus will contribute to the growth of the urban community life in ʻEwa by providing new jobs, core animal services, a recreational dog park, and a classroom for HHS educational and program needs. The Hoʻopili HHS campus is expected to accommodate the needs of approximately half the population of Oʻahu so that residents of West and Central Oʻahu will not need to drive to Honolulu for HHS services. It is expected as the Hoʻopili Master Planned Community and the City of Kapolei develop over the years, east-west vehicular traffic to and from Honolulu will gradually adjust and the new Hoʻopili HHS campus will help to support this. The proposed project is not expected to result in significant adverse cumulative transportation impacts.

5.13.2 Utilities

5.13.2.1 Description

Electrical Supply. Hawaiian Electric Company (HECO) provides power to the area through an electrical grounding system for electrical service and distribution. HECO owns and maintains a pole line along Farrington Highway that supports two 138- kilovolt (kV) lines and one 12.47-kV line (with provisions for a 46-kV line in the future). The pole line runs along Farrington Highway from HECO's ʻEwa Nui Substation to Palehua Road. From the ʻEwa Nui Substation, the 12.47-kV line and a 46-kV line runs along Farrington Highway to the Waipahu Interchange and up to Fort Weaver Road. The line runs along Old Fort Weaver Road to the intersection with Fort Weaver Road.

In its comments during preassessment consultation for the project, HECO wrote that it has existing easements and facilities on the subject property, and will need continued access for maintenance to the facilities.

Telephone and Communication Facilities. Hawaiian Telcom, which provides telephone service to the area, owns and maintains a pole line along Farrington Highway and Old Fort Weaver Road. This pole line is substandard; however, Spectrum (formerly Oceanic Time Warner Cable) and Pacific Lightnet have an agreement with Hawaiian Telcom for use of its poles and have attached cables to extend their facilities to Kapolei. AT&T has a fiber cable buried within the southern shoulder of the existing Farrington Highway right-of-way.

Water Supply. The project site is within the Board of Water Supply (BWS) service area. The BWS has a 440-foot elevation system and a 228-foot elevation system in the area. A 5.0-million gallon (MG) storage tank provides storage for the 228-foot elevation system and a 1.0-MG storage tank provides storage for the 440-foot elevation system. Both tanks are located mauka of the H-1 Freeway. Water from both the 440 system and the 228 system passes makai of the H-1 Freeway via separate transmission lines running through the Honouliuli Gulch crossing under the H-1 Freeway. These transmission lines connect both the BWS 440 and 228 systems to developed

lands below the H-1 Freeway. There are also major transmission lines in the Farrington Highway corridor. The transmission lines in Farrington Highway include 30- and 36-inch lines. An existing BWS water system is located along Old Fort Weaver Road.

In its comments during preassessment consultation for the project, the BWS wrote that the existing water system cannot provide adequate off-site fire protection to the proposed development. The BWS Water System Standards (WSS) require a fire hydrant spacing of 250 feet in the vicinity of the veterinarian/medical facilities and provide a flow of 2,000 gallons per minute. The nearest fire hydrant, Fire Hydrant No. L-00701, is approximately 300 linear feet away from the project site.

Irrigation System. An existing BWS 12-inch recycled effluent R-1 waterline is running along the east boundary of the project parcel, along Fort Weaver Road. The BWS has requested an easement be granted in favor of BWS for this line.

The BWS Rules and Regulations Section 1-112 requires nonpotable water for the irrigation of large landscaped areas. The proposed HHS development is adjacent to the BWS Recycled Water System with a connection to the system available along the east boundary of the parcel, along Fort Weaver Road. Thus, nonpotable water in the form of recycled water, which is designated R-1, must be used and the BWS has agreed to provide R-1 recycled water to the development.

Wastewater. The existing site does not contain any sanitary sewer system as it was previously used for agricultural purposes. Wastewater service to the surrounding areas is provided by the CCH Department of Environmental Services. The nearest sewer connections are located across Fort Weaver Road from the project parcel at the West Loch Fairways Residential Community and near the Child and Family Services Building, located south of the property, along Fort Weaver Road.

5.13.2.2 Potential Impacts and Proposed Mitigation

No significant impact to the existing electrical, water, and wastewater system is anticipated. Contractors will be required to verify existing infrastructure locations prior to the start of construction. In general, the relocation or modifications of any existing infrastructure is not expected. During construction, contractors will also be required to protect existing infrastructure and ensure against interruption of services within the project area.

Electrical Supply. The new facility will connect to existing HECO power lines along Old Fort Weaver Road. Additionally, HECO has existing easements and facilities on the project site and will need continued access for maintenance to the facilities. Existing electrical facilities will be provided on the design plans and the project coordinated with the HECO to minimize impacts. No impacts to electrical supply are expected.

Telephone and Communication Facilities. Connection to existing telephone and broadband internet cable services will be via existing Hawaiian Telcom and Spectrum communication facilities in the project area. No impacts to telephone and communication facilities are expected.

Water Supply. The proposed Hoʻopili HHS campus would provide about the same level of service as the Mōʻiliʻili location. A recent water bill for the Mōʻiliʻili facility indicated a domestic peak demand of 86 gallons per minute (133 fixture units), with a domestic average demand of 13,300 gallons per day. A water availability request was sent to the BWS and in a response letter dated February 5, 2016, it was found that the existing water system along Old Fort Weaver Road is adequate to accommodate the proposed development with 87 pounds per square inch (psi) of static pressure being provided through a 16-inch water main. Based on the indicated demand, an 8-inch waterline and an 8-inch by 2-inch force main water meter (for combined domestic and fire flows) would be required to service the property.

In accordance with the BWS WSS, the HHS will install fire hydrants on site that can provide a flow of 2,000 gallons per minute. Additionally, HHS may be required to extend a water lateral along Old Fort Weaver Road to install a new hydrant on Old Fort Weaver Road in the required proximity to the project site. Plans have been submitted for review and approval to the BWS. HHS will continue to coordinate with the BWS on the proposed project and construction schedule to minimize impacts on the water system. When water is made available, the HHS will be required to pay the BWS Water System Facilities Charges for resource development, transmission, and daily storage.

Where possible, HHS will utilize water conservation measures at the site. These measures may include the utilization of nonpotable water for irrigation using rain catchment, drought-tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

The proposed project is not expected to substantially increase water use where it could not be accommodated by existing facilities. The proposed project would not result in significant adverse cumulative impacts on water resources.

Irrigation System. An existing BWS 12-inch recycled effluent R-1 waterline is running along the east boundary of the project parcel, along Fort Weaver Road, and will require the granting of an easement to the BWS. The proposed site grading and utilities may also require portions of this line to be relocated to ensure the proposed structures are adequately set back from the waterline easements for the safety of the public and to prevent damage to the structures in the event of main breaks, repair, and maintenance.

In accordance with BWS Rules and Regulations Section 1-112, the HHS will apply nonpotable R-1 water for the irrigation of landscaped areas. Use of nonpotable water for irrigation will be via the BWS Recycled Water System with connection to the system along the east boundary of the parcel, along Fort Weaver Road. To the extent practicable, irrigation water for parts of the site and other nonpotable water purposes may be supplied by the nonpotable water system. The HHS will be responsible for obtaining the necessary easements, permits, and clearances, as applicable, and preparing any construction plans for the connection to the BWS system. HHS will continue to work with the BWS to utilize the R-1 system to irrigate parts of the site and other non-potable water purposes at the site to the extent practicable to ensure the health and safety of the HHS animals.

The HHS use of R-1 water will comply with Chapter 11-62, HAR, Wastewater Systems. The HHS will be required to prepare and submit to the DOH Wastewater Branch a recycled water application form found in Appendix C of the DOH Volume 2 of the Reuse Guidelines dated January 2016. The HHS will be responsible for any permitting, training, and on-site improvements, and any associated costs, as may be required by the DOH. The HHS will obtain DOH approval to use recycled water at the project and submit a copy of the DOH approval to the BWS. The availability of recycled water will be confirmed when a Recycled Water Service Agreement (RWSA) between the BWS and the HHS is executed, and construction plans have been approved by the BWS. HHS will be required to install a water meter and pay any applicable costs for the use of recycled water. Meter sizing and installation will be coordinated with the BWS as described in the RWSA.

The BWS R-1 effluent system utilizes a variable speed pumping system with no elevated storage reservoirs at this time. Therefore, pump running times and water pressures will vary depending on climate, water demand, and efficient pumping operation strategies, and time of day. The HHS is expected to be placed on a time schedule, usually at night, and will make reasonable accommodations to allow for a defined range of system pressures. A receiving tank and booster pump may be required to supply adequate pressures to the irrigation system; however, this will be verified with the BWS. The proposed project will also provide for BWS Cross-Connection Control and Backflow Prevention to meet the requirements of the BWS prior to the issuance of the Building Permit Applications.

Overall, the use of R-1 water at the site is expected to have beneficial environmental and economical impacts. Positive environmental impacts are expected from the conservation of limited water resources through the use of R-1 water for irrigation and other non-potable water uses. Beneficial economical impacts for HHS would result in lower fees for irrigation of the site as BWS currently does not charge facility reserve charges for connecting to the R-1 system, and non-potable water usage rates are almost half of potable water usage rates.

Wastewater. The existing site does not contain any sanitary sewer system. Therefore, a connection to a nearby sewer connection, either across Fort Weaver Road at the West Loch Fairways Residential Community or near the Child and Family Services Building located south of the property along Fort Weaver Road is required.

While the connection to the residential community is closest, it is not the recommended option mainly because it crosses a major State highway. This would require the execution of a Use & Occupancy Agreement with the State which can be a very lengthy and expensive process. The recommended option is to connect to the existing CCH system near the Child and Family Services Building. A portion of the system through Child and Family Services will be a gravity system since the grade allows for that. However, since the connection is located approximately 25 feet higher than the project site, a pump station and pressurized force main would be required. This system would consist of a 4-inch diameter force main and a 6-foot diameter by 13-foot deep wet well. The system would be serviced by a submersible sewage pump with a 276 gallons per minute peak flow rate. A smaller E-One pump system was also considered but was found to be inadequate for the amount of flow and debris required for this development.

A sewer connection application was submitted and approved for the connection near the Child and Family Services Building, on the condition that:

1. The sewer pump station and force main be privately-operated and maintained
2. An easement is obtained for the force main through the proposed future park (note: a future park is proposed south of the project site between the project parcel and the Child and Family Services Building. See **Section 5.13.8**).

Coordination with the Department of Parks and Recreation as well as the Child and Family Services Building is ongoing.

All wastewater plans will conform to applicable provisions of Chapter 11-62, HAR, "Wastewater Systems," and the DOH Wastewater Branch reserves the right to review the detailed wastewater plans for conformance to applicable rules.

Utility demands during construction and operation of the proposed project are not expected to exceed existing power, communication, water, and wastewater capabilities. Essentially, the long-term operation of the Hoʻopili HHS campus will require similar power, communication, water, and wastewater demand as the Mōʻiliʻili HHS campus.

5.13.3 Solid Waste

5.13.3.1 Description

On the island of Oʻahu most residential and general commercial trash is hauled to the Campbell Industrial Park H-POWER (Honolulu Program of Waste Energy Recovery) Plant. This waste-to-energy plant processes over 600,000 tons of waste per year and produces up to 10 percent of this island's electricity. Residual ash and non-combustible construction and demolition debris, as well as industrial waste, is disposed of in a landfill. The two landfills on Oʻahu are the Waimanalo Gulch Sanitary Landfill and the landfill in Nānākuli currently administered by PVT Land Company (CCH Department of Environmental Services, 2005).

5.13.3.2 Potential Impacts and Proposed Mitigation

The construction of the proposed project is not expected to have long-term impacts to solid waste facilities based on the limited scope and scale of work. Short-term impacts are anticipated in the form of construction debris that will be generated requiring disposal. The construction contractor shall be responsible for the disposal of construction debris at a CCH-approved disposal site.

The proposed project is not anticipated to generate a significant quantity of solid waste during planned construction activities. Solid waste that is generated will be disposed of in accordance with HAR, Chapter 11-58.1, Solid Waste Management Control. No secondary or cumulative impacts to solid waste facilities would occur from the implementation of the proposed project.

5.13.4 Police Protection

5.13.4.1 Description

The project area is within the Honolulu Police Department's (HPD) District 8, which encompasses the Leeward Coast and the ʻEwa Plain. Two police stations located in District 8 include the Kapolei Police Station at 1100 Kamokila Boulevard and the Waiʻanae Substation located at 85-939 Farrington Highway.

5.13.4.2 Potential Impacts and Proposed Mitigation

The project will not increase the on-site population and will not create long-term demand for additional police protection services. During the short-term, HPD may receive increased calls regarding construction-related traffic. In addition, HPD may be required to assist with project-related construction and traffic flow. Potential traffic impacts will be mitigated through the implementation of construction staging and traffic management plans. With the proposed mitigation measures, significant project-related impacts on police services are not anticipated.

No direct, secondary, or cumulative impacts to police protection are anticipated or expected, and no mitigation measures are necessary or recommended.

5.13.5 Fire Protection

5.13.5.1 Description

Fire prevention, suppression, and protection services for all of Oʻahu are provided by the Honolulu Fire Department (HFD).

Fire protection in the vicinity of the project is provided by the HFD Waipahu Fire Station, ʻEwa Beach Fire Station, Makakilo Fire Station, and East Kapolei Fire Station. To meet the projected population and economic growth in ʻEwa by 2035, four new fire stations at Ko Olina, Kalaeloa, Makaiwa Hills, and Hoʻopili are being planned.

HFD works with the Emergency Medical Services (EMS), who dispatch the closest available unit. This may be either an EMS ambulance or a fire company and typically depends on the type of emergency and location. Since there are only 16 EMS stations on Oʻahu, fire companies are frequently the first responder.

In its comments during preassessment consultation for the project, the BWS wrote that the existing water system cannot provide adequate off-site fire protection to the proposed development. The BWS WSS requires a fire hydrant spacing of 250 feet in the vicinity of veterinarian/medical facilities with a flow of 2,000 gallons per minute. The nearest fire hydrant, Fire Hydrant No. L-00701, is approximately 300 linear feet away from the project site.

5.13.5.2 Potential Impacts and Proposed Mitigation

Access for fire apparatus, water supply, and building construction within the project will comply with existing codes and regulations. Fire apparatus access roads will be provided with unobstructed width and vertical clearances in accordance with County requirements and the Uniform Fire Code, Section 902.2.1, as amended. Water infrastructure will be designed and installed in accordance with the Uniform Fire Code, Section 903.2, as amended and fire hydrants installed onsite, in accordance with the BWS WSS. Additionally, HHS may be required to extend a water lateral along Old Fort Weaver Road to install a new hydrant on Old Fort Weaver Road in the required proximity to the project site. Plans have been submitted for review and approval to the BWS. HHS will continue to coordinate with the BWS on the proposed project and construction schedule to minimize impacts on the water system. Civil drawings will also be submitted to HFD for review and approval.

The planned project would not increase the population and therefore would not increase demand for fire protection services. No direct, secondary, or cumulative impacts on fire protection are anticipated or expected, and no mitigation measures are necessary or recommended.

5.13.6 Health Care and Emergency Services

5.13.6.1 Description

The region is serviced by a variety of health care facilities. Queen's Medical Center West Oʻahu is the nearest hospital providing services such as emergency care, outpatient care, and lab and imaging services.

Emergency medical and surgical services are also provided by Pali Momi Medical Center in Aiea and Wahiawā General Hospital. Non-emergency medical services are offered at the Kaiser Permanente Punawai Clinic in Kapolei, the Kaiser Permanente Nanaikeola Clinic located in Waianae, and the Kapolei Medical Park.

The CCH EMS Division is divided into two operational districts, District 1 (West Oʻahu) and District II (East Oʻahu). Each District is comprised of 10 EMS Advanced Life Support ambulance units and one Rapid Response Unit. Two EMS Advanced Life Support Ambulance units are located nearby at the Kapolei Fire Station and the Waipahu Fire Station. The Rapid Response Paramedic Unit serving District 1 is located at Fire Station 35 Makakilo.

In addition, numerous privately operated medical/dental clinics and offices are located in the proposed project area to serve the local population.

5.13.6.2 Potential Impacts and Proposed Mitigation

The project will not increase the population in the vicinity or demand for emergency medical services. Therefore, existing medical services and facilities are anticipated to be adequate to accommodate the project. No significant adverse impacts are anticipated. No direct, secondary, or cumulative impacts on emergency services are anticipated or expected, and no mitigation measures are necessary or recommended.

5.13.7 Schools and Libraries

5.13.7.1 Description

The following State Department of Education (DOE) public schools are located within the vicinity of the project area.

Middle and High Schools

- Kapolei High
- Kapolei Middle
- Campbell High
- ʻEwa Makai Middle
- Ilima Intermediate

Elementary Schools

- Barbers Point
- Kapolei
- Kapolei II
- Makakilo
- Mauka Lani
- ʻEwa
- ʻEwa Beach
- Holomua
- Iroquois Point
- Kaimiloa
- Pöhäkea
- Keoneʻula

In its comments during preassessment consultation for the project, the State DOE wrote that the proposed action is not anticipated to impact HIDOE schools or facilities.

The University of Hawaiʻi West Oʻahu campus and Hawaiʻi Tokai International College are located west of Kūalakaʻi Parkway. Planned school facilities in the vicinity of the project are located within the Hoʻopili Master-Planned Community and will serve the educational needs of the area.

The nearest public libraries include the Waipahu Public Library, ʻEwa Beach Public Library, and Kapolei Public Library.

5.13.7.2 Potential Impacts and Proposed Mitigation

No long-term adverse impacts to school or library facilities are anticipated to occur as a result of the project. Short-term construction-related impacts may occur to roadway operations if travel to and from schools or libraries is through Old Fort Weaver Road. A traffic management plan will be implemented to minimize delays to the extent possible. The project is not anticipated to obstruct or hinder access to nearby educational facilities.

The proposed project would not increase nor decrease the provision of educational services to the community, and would not directly, secondarily, or cumulatively result in an increase in the area population, which would otherwise generate the need for school services.

5.13.8 Recreational Resources

5.13.8.1 Description

There are several existing and planned recreational facilities in the vicinity of the project area (see **Figure 5-6, Parks and Recreation Areas**).

Waipahu Cultural Garden Park, Honowai Neighborhood Park, and Pupuole Street Mini Park are located northeast of the project in Waipahu. Waipahu Cultural Garden Park offers tours to share the experience, lifestyles, and contributions of Hawaii's plantation workers. Honowai Neighborhood Park offers basketball, baseball, play fields, and playground facilities. Pupuole Street Mini Park offers basketball, tennis, play fields, and playground facilities.

West Loch Shoreline Park and West Loch Golf Course are located north of the project site in West Loch. West Loch Shoreline Park is a 3-mile trail for walking, running, nature trips, and bird watching and features a lake. The West Loch Golf Course is an 18-hole public golf course, owned and operated by the CCH in ‘Ewa Beach.

Asing Community Park, ‘Ewa Villages Golf Course, ‘Ewa Mahiko District Park, and Geiger Community Park are located south of the project site in ‘Ewa. Asing Community Park is a 24-acre park that offers wide-open playing fields, a baseball field, basketball courts, tennis courts, restrooms, and a playground. The ‘Ewa Villages Golf Course is an 18-hole, CCH-owned golf course located on Park Row Street in ‘Ewa Beach. ‘Ewa Mahiko District Park offers a gymnasium, multi-purpose building, two basketball courts, four tennis courts, two volleyball courts, accessible walkways, and baseball and play fields. Geiger Community Park offers a playground, a baseball field, tennis courts, and a basketball court.

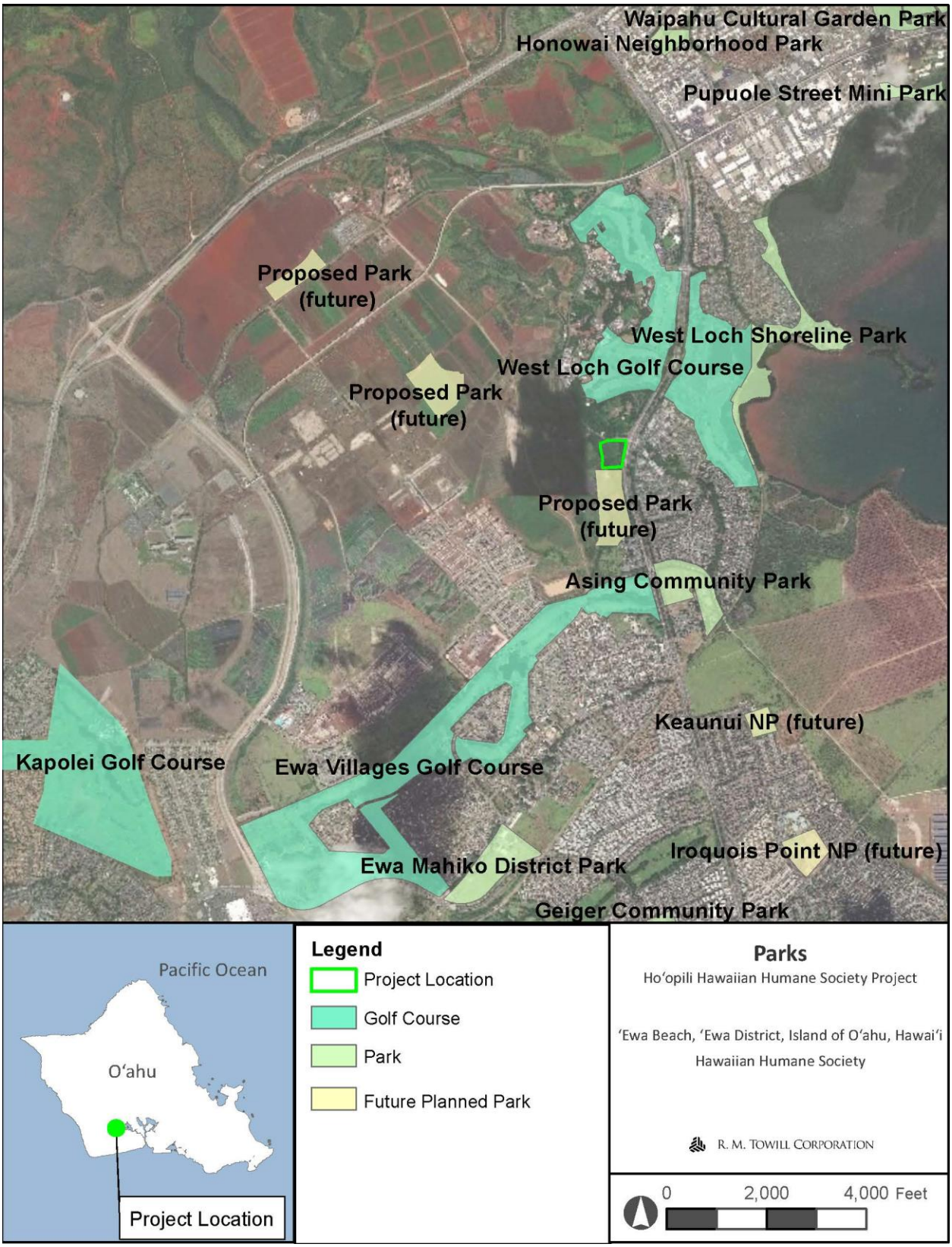
Kapolei Golf Course is privately-owned and located southwest of the project site along Kapolei Golf Course Road.

Other recreational facilities are planned in the vicinity of the project and within the Ho‘opili Master Planned Community and will serve the recreational needs of the area.

5.13.8.2 Potential Impacts and Proposed Mitigation

During construction, the project may result in short-term disruption of vehicle traffic along roadways within the near vicinity or periphery of the project. However, the project is not anticipated to obstruct or hinder access to nearby recreational facilities. The planned project will not increase the population in the vicinity and will not create additional long-term use of recreational facilities. The project will provide an off-leash dog park for use by HHS and the public for dogs to walk, run, play, and socialize, and meeting space for the community. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort. In its comments during preassessment consultation for the project, the CCH Department of Parks and Recreation wrote that it strongly supports this project as an important resource for the community and region. No adverse impacts are anticipated, and no mitigation is recommended.

Figure 5-6. Parks and Recreation Areas



5.14 Archeological and Historic Resources

5.14.1 Description

An Archaeological Inventory Survey (AIS) report for the Hoʻopili Community project was conducted in February 2006 by Cultural Surveys Hawaiʻi Inc. The HHS Hoʻopili campus project site is included within the study area. The AIS report is included in **Appendix E**. The AIS investigation was designed through detailed historical, cultural, and archaeological background research and a field inspection of the project area to determine the likelihood that cultural resources and/or historic properties may be affected by the project and, based on findings, considers cultural resource management recommendations. The AIS is intended to facilitate project planning and support historic preservation and environmental review compliance.

During the Phase I Environmental Site Assessment of the project area, conducted by Malama Environmental in March 2020, historical information identifying past site use was obtained from a variety of sources including CCH Directories, Aerial Photographs, Sanborn Fire Insurance Maps, and/or Topographic Maps. Information gleaned from historical aerial photographs, tax records, and another environmental report indicate that sugarcane was previously cultivated on the property at least as early as 1941 until the early 1990s. Since 1996 the subject site has been farmed in taro, cucurbit vegetables, and basil by Fat Law's Farm. The subject property has not been used since 2015.

No historic properties were identified within the Hoʻopili HHS project area.

5.14.2 Potential Impacts and Proposed Mitigation

No historic properties were identified within the HHS Hoʻopili project site or are expected based on past land use for agricultural purposes. Further, the specific land uses involving the development of the proposed HHS Campus will require plan review and clearance of the construction plans for the project by the State Historic Preservation Division (SHPD). In accordance with HRS, Chapter 6E, SHPD will be consulted regarding the proposed project's potential to impact historic resources and the necessity for further project-related historic preservation. The HHS is presently pursuing this process and anticipates concurrence with no effect to the project site. This process is expected to be completed following this HRS, Chapter 343, EA process. The project will comply with the requirements of the SHPD.

In the event that historic resources, including structural remains, subsurface cultural deposits, or human skeletal remains, are identified during the construction project, cease all work in the immediate vicinity of the find, protect the find from additional disturbance, and contact the SHPD at (808) 692-8015.

Section 6
Cultural Impact Assessment

The project requires compliance with the State of Hawaiʻi environmental review process (HRS §343), which requires consideration of a planned project's effect on traditional cultural beliefs, practices, and resources.

A Cultural Impact Assessment (CIA) for the Hoʻopili Community project was conducted in December 2006 by Cultural Surveys Hawaiʻi Inc. The HHS Hoʻopili campus project site is included within the study area. The CIA seeks to assess traditional cultural practices as well as resources pertaining to the project area. Through document research and cultural consultation efforts, the CIA provides information pertinent to the assessment of the planned project's impacts to cultural practices (per the Office of Environmental Quality Control's [OEQC] Guidelines for Assessing Cultural Impacts). The CIA report is included in full in **Appendix F**. A summary is presented below.

Background

The HHS Hoʻopili campus project site is located in the ahupuaʻa of Honouliuli, in the ʻEwa district on the island of Oʻahu. Honouliuli, translated as "dark water" or "blue harbor," is the largest ahupuaʻa in the moku (district) of ʻEwa. Honouliuli consists of lands stretching from the western boundary of Puʻuloa (Pearl Harbor) to the ʻEwa/Waiʻanae district boundary.

Honouliuli is associated with a number of legendary accounts. Many of these concern the actions of gods or demi-gods such as Käne, Kanaloa, Mäui, Kamapuaʻa, the reptile deity (moʻo) Maunauna, the shark deity Kaʻahupähau, and the demigod hero Palila. While there are several references to chiefly lineages and references to the ruling chiefs Hilo-a-Lakapu and Küaliʻi, there is no clear reference to powerful chiefs living permanently in Honouliuli.

The accessibility of Honouliuli lands, including the proposed project area, to the Hawaiians for gathering or other cultural purposes was radically curtailed during the second half of the nineteenth century. By the 1870s, herds of cattle grazing across the ʻEwa Plain probably denuded the landscape of much of the native vegetation. Subsequently, during the last decade of the nineteenth century, the traditional Hawaiian landscape was further distorted by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century, sugar cane cultivation was the dominating land use activity within the project area and surrounding areas. Sugar cane cultivation, and the sense that most of the ʻEwa plain was private property, restricted access inside the petition area and surrounding areas to employees of ʻEwa Plantation.

Background research indicates that sugarcane was previously cultivated on the HHS Hoʻopili campus project site at least as early as 1941 until the early 1990s. Since 1996 the subject site was farmed in taro, cucurbit vegetables, and basil by Fat Law's Farm. The HHS Hoʻopili campus project site has not been used since 2015.

Previous Settlements

There are three areas of early settlement in the Honouliuli ahupuaʻa: the extensive limestone plain with recurrent use as habitation for fishermen and gatherers and sometime gardeners; the uplands around Puʻukuʻua associated with kauwä (slave or servant) residences but probably used for agriculture and forest resources; and the rich cultivated lands of the Honouliuli ʻili (subdivision of an ahupuaʻa) for extensive wetland taro and the ahupuaʻa population center. These irrigated lands are centered around the west side of Pearl Harbor at Honouliuli Stream and its broad outlet into West Loch.

Consultation

Hawaiian organizations, government agencies, community members, and cultural and lineal descendants with ties to ʻEwa were contacted to: (1) identify potentially knowledgeable individuals with cultural expertise and knowledge of the Hoʻopili area and its surroundings, and (2) identify cultural concerns and potential impacts within the Hoʻopili area. An effort was made to locate informants with ties to ʻEwa and neighboring ahupuaʻa who live or had lived in the region or who, in the past, used the area for traditional and cultural purposes. For this assessment, Arline Eaton, Richard Hirata, Richard Oshiro, Kenneth Soma, Charles Nakamatsu, and other küpuna were interviewed. They mentioned that in the past there was a traditional gathering of taro and salt, along with fish such as päpio, mullet, as well as oysters, clams, and a variety of crab along the banks of Pearl Harbor. They all referred to this area of rich marine resources as Chocolate Beach and Three Stones (along Pearl Harbor). The people contacted were not aware of any ongoing cultural practices, archaeological sites, trails, or burials within the Hoʻopili area. Most of the people contacted mentioned that the Hoʻopili area was heavily altered by plantation activities.

Conclusion

While Honouliuli is associated with a number of legendary accounts involving gods, demi-gods, and chiefly lineages, there is no clear reference to powerful chiefs living permanently in Honouliuli. Access to Honouliuli lands, including the project area, by Hawaiians for gathering or other cultural purposes was radically curtailed during the second half of the nineteenth century. Herds of cattle grazing across the ʻEwa Plain likely denuded the landscape, which was subsequently further distorted by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century, sugar cane cultivation was the dominating land use activity. These two factors give evidence of the area's decline as a population center, and the disappearance of reasons to access it.

Based on the results of the CIA consultation process, the evidence from Land Court Awards (LCAs), and lack of resources, the vast majority of the Hoʻopili area was utilized less intensively during traditional times. Based on this evidence, no contemporary or continuing cultural practices occur within the Hoʻopili area at present.

Anticipated Impacts and Mitigation Measures

The HHS Hoʻopili campus project site was used for ranching, the production of commercial sugar, and the production of taro, cucurbit vegetables, and basil. Ranching, sugar cane production, and other crops would have most likely destroyed any cultural resources on the property. Additionally, no historic properties were identified within the HHS Hoʻopili project site or are expected based on past land use for agricultural purposes. Further, as provided above in Section 5.14.2, the specific land uses involving the development of the proposed HHS Campus will require plan review and clearance of the construction plans for the project by the SHPD. In accordance with HRS, Chapter 6E, SHPD will be consulted regarding the proposed project's potential to impact historic resources and the necessity for further project-related historic preservation. The HHS is presently pursuing this process and anticipates concurrence with no effect to the project site. This process is expected to be completed following this HRS, Chapter 343, EA process. The project will comply with the requirements of the SHPD.

Despite the decades of destructive modern activities and relatively few findings in the vicinity of the project area, there is always the possibility that intact artifacts or cultural deposits, including iwi kūpuna (ancestral human remains), may be encountered during ground disturbance. As a precautionary measure, personnel involved in construction or development activities will be informed of the possibility of inadvertent cultural or skeletal finds. As provided above in **Section 5.14.2**, in the event that historic resources are inadvertently discovered the SHPD will be notified and construction in the area will cease until such time that work activities may be resumed as allowed by the SHPD.

Currently, no contemporary or continuing cultural or traditional practices occur within the proposed project area. The project is not located near the coast and therefore, would not affect access to marine resources. Therefore, no impacts are expected and no mitigation measures are planned.

Section 7
Relationship to Land Use Policies, Plans, and Controls

Federal, State of Hawaiʻi, and CCH policies, plans, and land use controls are established to guide development in a manner that enhances the environment and quality of life. The establishment of policies, plans, and land use controls at all levels of government are further promulgated to help ensure that the long-term social, economic, environmental, and land use needs of the community and region can be met. The proposed project's relationship to land use policies, plans, and controls for the region and proposed activity are as follows.

7.1 Federal

7.1.1 Federal Aviation Administration Order 5190.6B

FAA Order 5190.6B sets forth policies and procedures for the FAA Airport Compliance Program. It provides basic guidance for FAA personnel in interpreting and administering the various continuing commitments airport owners make to the United States as a condition for the grant of federal funds or the conveyance of federal property for airport purposes. The Order discusses the obligations set forth in the standard airport sponsor assurances, addresses the application of the assurances in the operation of public-use airports, and facilitates interpretation of the assurances by FAA personnel. The order's intent is to ensure compatible land uses near federally obligated airports.

In the state of Hawaiʻi, the Department of Transportation-Airports Division discourages such land uses that may attract hazardous wildlife within five statute miles of airport boundaries, pursuant to FAA Advisory Circular 150/5200-33C. As recommended by the Department of Transportation-Airports Division in their preassessment comment letter dated November 19, 2020, projects within the five-mile airport boundary are advised to read the Technical Assistance Memorandum (TAM) File No. TAM-2016-1 published by the Department of Business, Economic Development and Tourism, Office of Planning and Department of Transportation-Airports Division on August 1, 2016, for guidance with development and activities that may require further review and permits.

Additionally, pursuant to the Code of Federal Regulations, Title 14, Part 77.9, projects within 20,000 feet of public use or military airports that exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet requires the submittal of FAA Form 7460-1 Notice of Proposed Construction or Alteration. Construction equipment and staging area heights, including heights of temporary construction cranes, shall be included in the submittal.

Discussion: The project site is approximately 3.82 miles northeast of the Kalaeloa Airport, and is therefore located within the FAA-designated five-mile radius. The applicant will develop the project following the guidance set forth in TAM File No. TAM-2016-1 and as recommended by the Department of Transportation-Airports Division.

Furthermore, the project site is approximately 19,694 feet from the end of Runway 22R at Kalaeloa Airport and therefore within 20,000 feet of a public use or military airport. The applicant will submit the required FAA Form 7460-1 Notice of Proposed Construction or Alteration.

The design, landscaping, and drainage improvements would not create conditions to attract wildlife. The stormwater detention pond will be designed in accordance with FAA Advisory Circular 150/5200-33C, Hazardous Wildlife Attractants on or Near Airports, with a maximum 48-hour detention period after the design storm and to remain completely dry between storms. If wildlife is attracted to the project site, the applicant shall take appropriate measures to ensure proper mitigation of the potential wildlife hazard. HHS will continue to consult with the Department of Transportation-Airports Division regarding appropriate mitigation measures to ensure that the proposed project may not attract hazardous wildlife, glint/glare hazard, or aerial obstructions.

7.2.1 Americans with Disabilities Act

The ADA of 1990 establishes guidelines for accessibility to buildings and facilities by individuals with disabilities.

Discussion: To the extent required by regulations issued by federal agencies, ADA guidelines will be applied to the project site during the design and construction phases. In addition, the design of public spaces will be integrated to promote greater accessibility for persons with disabilities. It should be noted that most of the project area consists of naturally moderate slopes, thus providing the potential for good accessibility.

7.2 State of Hawai‘i

7.2.1 Hawai‘i State Plan

The Hawai‘i State Plan, adopted in 1978, and promulgated in HRS, Chapter 226, consists of three major parts:

- Part I, describes the overall theme including Hawai‘i’s desired future and quality of life as expressed in goals, objectives, and policies.
- Part II, Planning Coordination and Implementation, describing a statewide planning system designed to coordinate and guide all major state and county activities and to implement the goals, objectives, policies, and priority guidelines of the Hawai‘i State Plan.
- Part III, Priority Guidelines, which express the pursuit of desirable courses of action in major areas of statewide concern.

The proposed project is consistent with the objectives and policies of the Hawai‘i State Plan. The directly relevant State Plan goals, objectives, policies, and priority guidelines, along with a discussion of how the project conforms to them are provided in **Table 7-1** and discussed below.

Table 7-1. Hawai'i State Plan Applicability to the Proposed Project

Hawai'i State Plan Objectives, Policies, and Priority Guidelines	Applicability to the Proposed Project
Objectives and Policies	
§226-5 Objective and policies for population	**Applicable**
§226-6 Objectives and policies for the economy--in general	**Applicable**
§226-7 Objectives and policies for the economy-- agriculture	Not Applicable
§226-8 Objective and policies for the economy--visitor industry	Not Applicable
§226-9 Objective and policies for the economy--federal expenditures.	Not Applicable
§226-10 Objective and policies for the economy--potential growth activities	Not Applicable
§226-10.5 Objectives and policies for the economy--information industry	Not Applicable
§226-11 Objectives and policies for the physical environment--land-based, shoreline, and marine resources.	Not Applicable
§226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources.	Not Applicable
§226-13 Objectives and policies for the physical environment--land, air, and water quality	**Applicable**
§226-14 Objective and policies for facility systems--in general	Not Applicable
§226-15 Objectives and policies for facility systems--solid and liquid wastes	Not Applicable
§226-16 Objective and policies for facility systems--water	Not Applicable
§226-17 Objectives and policies for facility systems--transportation	Not Applicable
§226-18 Objectives and policies for facility systems--energy	Not Applicable
§226-18.5 Objectives and policies for facility systems--telecommunications	Not Applicable
§226-19 Objectives and policies for socio-cultural advancement--housing	Not Applicable
§226-20 Objectives and policies for socio-cultural advancement--health	Not Applicable
§226-21 Objective and policies for socio-cultural advancement--education	**Applicable**
§226-22 Objective and policies for socio-cultural advancement--social services	Not Applicable
§226-23 Objective and policies for socio-cultural advancement--leisure	Not Applicable
§226-24 Objective and policies for socio-cultural advancement--individual rights and personal well-being	Not Applicable
§226-25 Objective and policies for socio-cultural advancement--culture	Not Applicable
§226-26 Objectives and policies for socio-cultural advancement--public safety	Not Applicable
§226-27 Objectives and policies for socio-cultural advancement--government	Not Applicable
Priority Guidelines	
§226-102 Overall Direction	Not Applicable
§226-103 Economic priority guidelines	Not Applicable
§226-104 Population growth and land resources priority guidelines	**Applicable**
§226-105 Crime and criminal justice	Not Applicable
§226-106 Affordable housing	Not Applicable
§226-107 Quality education	Not Applicable
§226-108 Sustainability	**Applicable**
§226-109 Climate change adaptation priority guidelines	**Applicable**

HRS §226-5 Objective and policies for population

Objective: It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter.

Policies: (b)(4) Encourage research activities and public awareness programs to foster an understanding of Hawai'i's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai'i's population; and (b)(7) Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.

Discussion: The Ho'opili HHS project will not have a direct effect on population growth statewide as it relates to physical, economic, and social objectives, however, the project will help to accommodate the increased HHS service needs of the area by providing a facility in the West O'ahu. The project will provide necessary support services for the orderly growth of this region.

HRS §226-6 Objectives and policies for the economy--in general

Objective: Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai'i's people, while at the same time stimulating the development and expansion of economic activities capitalizing on defense, dual-use, and science and technology assets, particularly on the neighbor islands where employment opportunities may be limited.

Policies: (b)(9) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives; and (b)(10) Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawaii's small scale producers, manufacturers, and distributors.

Discussion: The proposed project site was deeded[3], by D. R. Horton to the HHS to establish a new Ho'opili HHS campus for the care of animals in the West O'ahu region. The Ho'opili HHS project will provide a positive but limited economic impact on the construction industry. Long-term economic benefits are expected from the creation of new jobs for the operation of the new facility.

HRS §226-13 Objectives and policies for the physical environment – land, air, and water quality

Objective: Maintenance and pursuit of improved quality in Hawaii's land, air, and water resources.

Policies: (b)(6) Encourage design and construction practices that enhance the physical qualities of Hawaii's communities; and (b)(7) Encourage urban developments in close proximity to existing services and facilities.

Discussion: The Ho'opili HHS project is surrounded by or in close proximity to existing and planned developments, services, and facilities. The project will provide a venue to support a

[3] Deed Between D. R. Horton and Hawaiian Humane Society, September 28, 2017, Perpetual Non-Exclusive Easement, Exhibit C, Depicting a map of Lot 1, consisting of 5.473 Acres, also referred to as Lot B (DPP 2007/ SU-110) (Lot is situated at the corner of Old Fort Weaver Road and Fort Weaver Road, FASP No. S-RS-0760(2).

growing island population with limited resources. Additionally, the project will provide an off-leash dog park for use by HHS and the public for dogs to walk, run, play, and socialize, and meeting space for the community. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

HRS §226-21 Objective and policies for socio-cultural advancement--education

Objective: Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.

Policies: (b)(1) Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups; (b)(2) Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs; and (b)(3) Provide appropriate educational opportunities for groups with special needs

Discussion: The new Hoʻopili HHS campus will contribute to the growth of the urban community life in ʻEwa by providing a classroom for HHS educational and program needs. The HHS offers a number of programs for people and animals, including educational initiatives including: (1) outreach programs for at-risk youth providing mentoring and values development programs; (2) public education to break the cycle of violence linking animal abuse to an early warning sign of family violence; (3) pet care and obedience training classes; and (4) school and community group visits. The HHS's prevention, education, and outreach programs impact more than 10,000 youth in underserved communities and an additional 10,000+ individuals through the HHS's pet food bank, pet visitation program to hospice and health care facilities, emergency foster care program for pet owners in crises.

HRS §226-104 Population growth and land resources

Priory Guidelines: (a) Priority guidelines to effect desired statewide growth and distribution: (3) Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.

Discussion: The new Hoʻopili HHS campus is proposed in an appropriately designated land use district (SLUD: Urban) and within the Hoʻopili Master Planned Community. The project will support the need for additional HHS services on Oʻahu and in the ʻEwa region and coincides with population growth in the area.

HRS §226-108 Priority Guideline, Sustainability

Priory Guidelines: (a) Priority guidelines and principles to promote sustainability shall include: (1) Encouraging balanced economic, social, community, and environmental priorities; and (5) Promoting decisions based on meeting the needs of the present without compromising the needs of future generations.

Discussion: The project promotes decisions based on meeting the needs of the present and projected future growth, without compromising the generations to come.

HRS §226-109 Priority Guideline, Climate change adaptation

Priory Guidelines: Priority guidelines to prepare the State to address the impacts of climate change, including impacts to the areas of agriculture; conservation lands; coastal and nearshore marine areas; natural and cultural resources; education; energy; higher education; health; historic preservation; water resources; the built environment, such as housing, recreation, transportation; and the economy shall: (10) Encourage planning and management of the natural and built environments that effectively integrate climate change policy.

Discussion: The project supports the priority guidelines for climate change. The new Ho'opili HHS campus will not contribute to adverse impacts relating to existing climate change and sea level rise. The project area is not located in the tsunami evacuation zone or extreme tsunami evacuation and is not expected to be affected by increases in sea levels.

7.2.2 Hawai'i State Functional Plans

The Hawai'i State Plan is primarily guided by the State Functional Plans (Chapter 226, HRS) and implemented by the Department of Budget and Finance and State Land Use Commission. State Functional Plans are prepared by various state agencies to serve as the primary implementing vehicle for the goals, objectives, and policies of the Hawai'i State Plan. While the State Plan establishes long-term objectives for Hawai'i, the State Functional Plans focus on policies and priority actions that can be implemented in the short term. Policies and objectives of the State Human Services and Recreation Functional Plans are applicable to the project and are discussed below:

Human Services Functional Plan (1989)

Issue Area: Children and Family Support

Objective D: To address factors that contribute to child abuse and other, forms of family violence.

Strategy: To improve parenting methods as a way of curbing child abuse.

Policy D(2): To increase public awareness of better parenting methods and to improve parenting in our community.

Implementing Action D(2)(a)(4): Programs to increase public awareness on the problems of abuse and neglect, to teach positive parenting, and to direct those in need to appropriate services.

Discussion: The project is consistent with the objectives and policies of the State Human Services Functional Plan. The HHS offers a number of programs for people and animals to

increase public awareness of the problems of abuse and neglect. These programs include outreach programs for at-risk youth to provide mentoring and values development, and public education to break the cycle of violence linking animal abuse to an early warning sign of family violence. These types of programs are provided at the existing HHS Mōʻiliʻili campus and will also be provided at the new HHS Hoʻopili campus.

Recreation Functional Plan (1991)

Objective II-C: Improve and expand the provision of recreation facilities in urban areas and local communities.

Policy II-C(1): Meet the demand for recreational opportunities in local communities.

Implementing Action II-C(1)b: Provide additional playing fields and upgrade existing fields for both youth and adult sports leagues.

Discussion: The project is consistent with the objectives and policies of the State Recreation Functional Plan. The new Hoʻopili HHS campus will contribute to the growth of the urban community life in ʻEwa by providing a recreational dog park for use by HHS and the public for dogs to walk, run, play, and socialize and a meeting space for the community. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

7.2.2 Hawaiʻi State Land Use Law

The State Land Use Commission classifies all lands in the State of Hawaiʻi into one of four land use designations: Urban, Rural, Agricultural, and Conservation. According to HRS, Chapter 205, State Land Use Law:

> *"Chapter 205, HRS, Districting and classification of lands:"*
>
> *"(a) There shall be four major land use districts in which all lands in the State shall be placed: urban, rural, agricultural and conservation. The land use commission shall group contiguous land areas suitable for inclusion in one of these four major districts. The commission shall set standards for determining the boundaries of each district provided that:"*
>
> *"(1) In the establishment of boundaries of urban districts those lands that are now in urban use and a sufficient reserve area for foreseeable urban growth shall be included;"*
>
> *"In establishing the boundaries of the districts in each county, the commission shall give consideration to the master plan or general plan of the county."*
>
> *(b) Urban districts shall include activities or uses as provided by ordinances or regulations of the county within which the urban district is situated.*

Discussion: The proposed action involves the use of land within the Urban State Land Use District. The HHS Hoʻopili project is consistent with this designation. See **Figure 7-1, State Land Use Districts**.

Figure 7-1. State Land Use Districts

7.2.3 Hawai'i State Environmental Policy

The State Environmental Policy (HRS, Chapter 344), establishes a set of guidelines to conserve the State's natural resources and to enhance the quality of life through all State programs, authorities, and resources. The goals set forth for conservation focus on an effort to maintain and enhance the use of natural resources to create productive harmony between nature and the requirements of the people of Hawai'i. The State Environmental Policy also sets goals to enhance the quality of life through diverse opportunities for social and economic growth in the community. These opportunities are pursued through sustainable practices and the use of renewable resources to create stable improvements in community identity, resource efficiency, and harmony with the natural environment.

The policies and guidelines of the State Environmental Policy which pertain to this project are discussed below.

HRS§344-3 Environmental Policy

Objective: It shall be the policy of the State, through its programs, authorities, and resources to: (1) Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawai'i.

HRS§344-4 Guidelines

Objective: In pursuance of the state policy to conserve the natural resources and enhance the quality of life, all agencies, in the development of programs, shall, insofar as practicable, consider the following guidelines.

Policies:

- *(2) Land, water, mineral, visual, air, and other natural resources.*
  - *(a) Encourage management practices which conserve and fully utilize all natural resources.*
  - *(b) Promote irrigation and waste water management practices which conserve and fully utilize vital water resources.*
- *(3) Flora and fauna.*
  - *(b) Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.*
- *(4) Parks, recreation, and open space.*
  - *(a) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses.*
- *(9) Education and culture.*
  - *(b) Encourage both formal and informal environmental education to all groups.*

Discussion: The proposed HHS Ho‘opili project is supportive of the State’s environmental guidelines and policies. The project will meet storm water quality requirements of the Rules Relating to Storm Drainage Standards through the use of a detention basin and structural methods. Proposed drainage improvements within the project area include an underground culvert system comprised of two 36-inch diameter pipes and an approximately 25,500 cubic foot on-site detention basin near the north-eastern corner of the project site. The detention basin would be approximately 9,900 sf in area and 3.5 feet high and promote on-site infiltration of surface water and facilitate groundwater recharge. The detention basin has been designed to manage and mitigate all additional stormwater runoff from the project site and keep the rate of discharge to the State box culvert located to the north of the project site below existing levels.

To conserve water resources HHS will continue to work with the BWS to utilize the R-1 system to irrigate parts of the site and other non-potable water purposes at the site to the extent practicable to ensure the health and safety of the HHS animals.

Development of the proposed Ho‘opili HHS project will not impact any endangered, threatened, or otherwise protected plant species as none are known to be present at the site. Native and indigenous vegetation will be considered in the selection of plant materials for landscaping. The proposed project will not result in significant adverse secondary or cumulative impacts to flora resources.

The new Ho‘opili HHS campus will contribute to the growth of the urban community life in ‘Ewa by providing recreational space and educational and program needs. The new Ho‘opili HHS campus will establish a new recreational dog park for use by HHS and the public for dogs to walk, run, play, and socialize, and meeting space for the community. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort. Additionally, the new facility will offer a number of programs for people and animals, including: (1) outreach programs for at-risk youth providing mentoring and values development programs; (2) public education to break the cycle of violence linking animal abuse to an early warning sign of family violence; (3) pet care and obedience training classes; and (4) school and community group visits.

7.2.4 Clean Water Act

The CWA is the key legislation governing surface water quality protection in the United States. Sections 401 and 402 of the Act require permits for actions that involve wastewater discharges or discharge of dredged or fill material into WOUS. The EPA is responsible for administering the CWA. In Hawai‘i, the EPA has delegated responsibility for implementing the Act to the State DOH CWB under HAR, Chapter 11-55, Water Pollution Control. States can use their Water Quality Standards (WQS) in the Section 401 WQC to review and approve, condition, or deny all Federal permits or licenses that may result in discharges to State waters, including wetlands. States and tribes make decisions to deny, certify, or condition permits or licenses primarily to ensure that the activity will comply with State WQS. In addition, States and tribes look at whether the activity will violate effluent limitations, new source performance standards, toxic pollutants, and other water resource requirements of State/tribal law or regulation. Section 402 of

the CWA makes it unlawful to discharge any pollutant from a point source into navigable waters unless a NPDES permit is obtained for ground-disturbing activities equal to or greater than one acre.

Discussion: No jurisdictional "WOUS" are located in the project area, therefore DOH WQC under CWA, Section 401, would not be applicable to the project. Section 402 of the CWA is applicable to this project. A NPDES permit pursuant to the CWA, Section 402, will be filed for discharges of storm water runoff associated with construction activities.

7.2.5 Hawai'i Coastal Zone Management Program

All land and water use activities in the state must comply with HRS, Chapter 205A, Hawai'i Coastal Zone Law. The State of Hawai'i designates the Coastal Zone Management (CZM) Program to manage the intent, purpose, and provisions of HRS, Chapter 205(A)-2, as amended, for the areas from the shoreline to the seaward limit of the State's jurisdiction, and any other area which a lead agency may designate for the purpose of administering the CZM Program.

The objectives of the State's Hawai'i CZM Program, Section 205(A)-2, HRS, are to protect valuable and vulnerable coastal resources such as coastal ecosystems, special scenic, and cultural values, and recreational opportunities. The objectives of the program are also to reduce coastal hazards and to improve the review process for activities planned within the coastal zone. Each county is responsible for designating a SMA that extends inland from the shoreline. Development within this SMA is subject to County approval to ensure the proposal is consistent with the policies and objectives of the Hawai'i CZM Program.

The project is not located within the coastal zone or SMA as delineated by the CCH. However, HRS Chapter 205A requires all state and county agencies to enforce CZM objectives and policies as set forth in HRS §205A-2. The program outlines management objectives centered around ten areas: 1) Recreational Resources; 2) Historic Resources; 3) Scenic and Open Space Resources; 4) Coastal Ecosystems; 5) Economic Uses; 6) Coastal Hazards; 7) Managing Development; 8) Public Participation in Coastal Management; 9) Beach Protection, and 10) Marine Resources. The following discussions address the applicability of the project to the ten CZM objectives and policies.

Recreational Resources

Objective: Provide coastal recreational opportunities accessible to the public.

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

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

(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources

will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;
(v) Ensuring public recreational uses of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
(vi) Adopting water quality standards and regulating point and nonpoint sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;
(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and
(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.

Discussion: The project would have no impact on the coordination and funding of coastal recreation planning and management. The project is not located directly adjacent to the coastline, therefore, no shoreline recreational opportunities will be affected by the project improvements. Existing coastal resources with significant recreational value and existing public accessways will not be impacted. No shoreline improvements are planned, such as artificial reefs or beaches.

Historic Resources

Objective: Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

(A) Identify and analyze significant archaeological resources;

(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and

(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

Discussion: The proposed project is not anticipated to have any adverse impacts on natural and manmade historic and prehistoric resources in the CZM area. In accordance with HRS, Chapter 6E, and the requirements of the SHPD, DLNR, should any historic resources, including human skeletal and significant cultural remains, be identified during project activities, the following steps will be taken: (1) Work will cease in the immediate vicinity of the find; (2) The find will be protected from any additional disturbance; and (3) The SHPD, will be contacted immediately at their Main Office at (808) 692-8015 for further instructions including the conditions under which project activities may resume.

Scenic and Open Space Resources

Objective: Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.

(A) Identify valued scenic resources in the coastal zone management area;

(B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural land forms and existing public views to and along the shoreline;

(C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and

(D) Encourage those developments that are not coastal dependent to locate in inland areas.

Discussion: The project will not adversely impact existing scenic and open space resources. There are no scenic view sheds identified in the project vicinity or detailed in the 'Ewa DP. The project is not located directly adjacent to the shoreline and does not adversely affect shoreline open space.

Coastal Ecosystems

Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

(B) Improve the technical basis for natural resource management;

(C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

(D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and

(E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.

Discussion: The proposed project is located well away from the shoreline area and will not affect natural resource management or valuable coastal ecosystems.

Economic Uses

Objective: Provide public or private facilities and improvements important to the State's economy in suitable locations.

(A) Concentrate coastal dependent development in appropriate areas;

(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and

(C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:

(i) Use of presently designated locations is not feasible;
(ii) Adverse environmental effects are minimized; and
(iii) The development is important to the State's economy.

Discussion: The project is not considered a coastal dependent development and is not anticipated to have an adverse impact on the State's economy.

Coastal Hazards

Objective: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint source pollution hazards;

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

(D) Prevent coastal flooding from inland projects.

Discussion: The project is not located within the tsunami evacuation zone or extreme tsunami evacuation zone. Tsunami conditions impose no constraints on the project. The project area is located in Flood Zone D, which is defined as an undetermined flood hazard area, and Flood Zone X, which includes areas of minimal hazard. The site is not located directly adjacent to the shoreline and/or stream courses; therefore, risks of impacts occurring from storm waves and/or stream flooding are low.

Managing Development

Objective: Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

(B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and

(C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

Discussion: The project supports the development review process, communication, and public participation. This EA is prepared pursuant to HRS Chapter 343, to conduct an environmental review of the HHS Ho'opili project and provides an evaluation of the potential short and long-term impacts on environmental, social, and cultural resources. The OEQC publishes notice of the EA availability for public review and participation, providing a 30-day comment period. During the pre-assessment consultation of the project, agencies, organizations, and individuals were also consulted.

Public Participation

Objective: Stimulate public awareness, education, and participation in coastal management.

(A) Promote public involvement in coastal zone management processes;

(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and

(C) Organize workshops, policy dialogues, and site-specific mitigation to respond to coastal issues and conflicts.

Discussion: The proposed project is located inland; therefore, awareness, education, and participation processes related to coastal zone management issues are not applicable. However, public involvement of the proposed project will consist of a public notice of the EA in the OEQC bulletin and pre-assessment consultation with agencies, organizations, and individuals.

Beach Protection

Objective: Protect beaches for public use and recreation.

(A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;

(B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and

(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

Discussion: The proposed project is located inland; therefore, the protection of beaches for public use and recreation-related to coastal zone management issues are not applicable.

Marine Resources

Objective: Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

(A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

(B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;

(C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;

(D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and

(E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Discussion: The proposed project is located inland; therefore, protection, use, and development of marine and coastal resources related to coastal zone management issues are not applicable.

7.3 City and County of Honolulu

7.3.1 General Plan

Adopted by resolution in 1977, the 1992 revised CCH O‘ahu General Plan, as amended in 2002, sets forth the long-range objectives for the general welfare and prosperity of the people of O‘ahu and broad policies to attain those objectives. The Proposed Revised O‘ahu General Plan dated December 2017 was approved by the City Council in February 2020.

The Proposed Revised O‘ahu General Plan provides objectives and policies intended to guide and coordinate CCH land use planning and regulation, and budgeting for operations and capital improvements. The Proposed Revised O‘ahu General Plan includes continued focus on critical issues such as regional population, economic health, and affordable housing, while also addressing concerns such as climate change, sea level rise, and sustainability.

The project is consistent with the applicable objectives and policies of the Proposed Revised O‘ahu General Plan as described below.

Population

Objective B: To establish a pattern of population distribution that will allow the people of O‘ahu to live, work and play in harmony.

Policy 2: Encourage development within the secondary urban center at Kapolei and the ‘Ewa and Central O‘ahu urban-fringe areas to relieve developmental pressures in the remaining

urban-fringe and rural areas and to meet housing needs not readily provided in the primary urban center.

Policy 4: Direct growth according to Policies 1, 2, and 3 above by providing development capacity and needed infrastructure to support a distribution of O'ahu's resident population.

Discussion: The Ho'opili HHS project is surrounded by or in close proximity to existing and planned developments, services, and facilities. The project will provide a venue to support a growing island population with limited resources. Additionally, the project will provide an off-leash dog park for use by HHS and the public for dogs to walk, run, play, and socialize, and meeting space for the community. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort. The project will provide HHS services to half the population of O'ahu. This will help to support existing and projected population growth of the 'Ewa region and development within the Secondary Urban Center.

The Economy

Objective G: To establish a pattern of population distribution that will allow the people of O'ahu to live, work and play in harmony.

Policy 1: Concentrate economic activity and government services in the primary urban center and in the secondary urban center at Kapolei.

Discussion: The project will help to establish a pattern of population distribution on O'ahu by providing HHS services in the 'Ewa region. This additional capacity of the HHS will support concentrated economic activity in the Secondary Urban Center.

Physical Development and Urban Design

Objective A: To coordinate changes in the physical environment of O'ahu to ensure that all new developments are timely, well-designed, and appropriate for the areas in which they will be located.

Policy 1: Provide infrastructure improvements to serve new growth areas, redevelopment areas, and areas with badly deteriorating infrastructure.

Policy 2: Coordinate the location and timing of new development with the availability of adequate water supply, sewage treatment, drainage, transportation, and other public facilities and services.

Policy 9: Locate community facilities on sites that will be convenient to the people they are intended to serve.

Objective D: To develop a secondary urban center in 'Ewa with its nucleus in the Kapolei area.

Policy 2: Encourage the development of a major residential, commercial, and employment center within the secondary urban center at Kapolei.

Discussion: The planned project promotes the physical development and urban design objectives of the General Plan. The project is being constructed in the Hoʻopili Master Planned Community. The project will support the need for additional HHS services on Oʻahu and in the ʻEwa region and coincides with population growth and existing and planned developments, services, and facilities in the area. The Hoʻopili HHS campus is expected to accommodate the needs of approximately half the population of Oʻahu so that residents of West and Central Oʻahu will not need to drive to Honolulu for HHS services.

Culture and Recreation

Objective D: To provide a wide range of recreational facilities and services that are readily available to residents and visitors alike, and to balance access to natural areas with the protection of those areas.

Policy 3: Develop, maintain, and improve urban parks, squares, and beautification areas in high-density urban places.

Discussion: The new Hoʻopili HHS campus will contribute to the growth of the urban community life in ʻEwa by providing a recreational dog park for use by HHS and the public for dogs to walk, run, play, and socialize and a meeting space for the community. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

7.3.2 ʻEwa Development Plan

The ʻEwa DP, adopted by the City Council in 1997 and amended by Ordinance 00-16 in 2000 and again by Ordinance 13-26 in 2013, is one of eight community-oriented plans intended to help guide public policy, investment and decision-making on a 25-year planning horizon, sets forth a vision and implementation plan for a Secondary Urban Center in ʻEwa. The ʻEwa DP vision statement notes that the development of adequate infrastructure is essential to meet the needs of new and existing development. Future population and economic growth on Oʻahu are to be directed to the ʻEwa planning region and the Primary Urban Center. As such, the ʻEwa DP serves as a policy guide for the actions and decisions that will support that growth.

Discussion: The proposed project is in conformance with the DP's vision to meet the needs of new and existing developments in the Secondary Urban Center in ʻEwa.

7.3.3 Hoʻopili Urban Design Plan

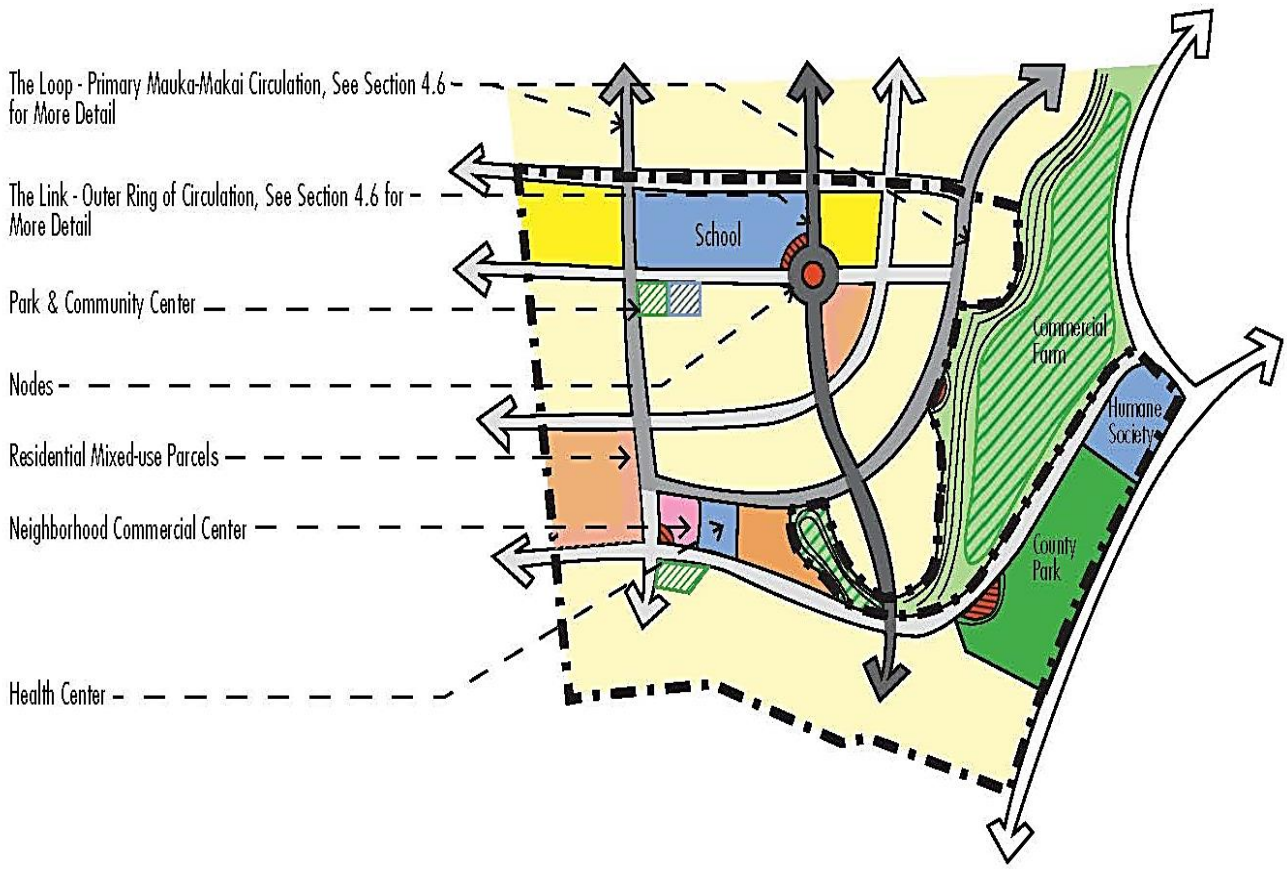
The Hoʻopili Urban Design Plan (UDP) sets forth concepts, standards, and guidelines intended to shape approximately 1,289 acres of land into a unique urban environment that realizes a coming together of vision, planning, and lifestyles to enhance East Kapolei. The Hoʻopili UDP Conceptual Land Use Plan identifies the HHS Hoʻopili project site for business/commercial land

use and designates the site for use by the HHS, as shown in **Figure 7-2, Hoʻopili Urban Design Plan Concept Sketch**.

Individual developments and projects are subject to review and approval by the Hoʻopili Design Advisory Board established by D. R. Horton. The CCH DPP also reviews plans to assure compliance with the UDP. Project approval is required prior to building permit application and commencement of construction.

Discussion: The proposed HHS Hoʻopili project is in conformance with the Hoʻopili UDP. The Hoʻopili UDP Conceptual Land Use Plan identifies the HHS Hoʻopili project site for business/commercial land use and designates the site for use by the HHS. In July 2020, in accordance with the Hoʻopili UDP, the Hoʻopili Design Advisory Board approved the schematic and development design submittal for the Hoʻopili HHS project. In addition, project plans will be submitted to the CCH DPP for review and approval.

Figure 7-2. Hoʻopili Urban Design Plan Concept Sketch



7.3.4 Land Use Ordinance

The Land Use Ordinance (HRS §21-3) implements the goals and objectives of the O‘ahu General Plan and the ‘Ewa Development Plan. All lands within the CCH are zoned into specific districts. According to the Department of Planning and Permitting, the project site is primarily zoned B-1 (Neighborhood Business District), with a small sliver along the southern portion of the parcel zoned P-2 (General Preservation) and is not in a special district. See **Figure 7-3, CCH Zoning Districts**.

The HHS is considered a veterinary establishment. According to Revised Ordinances of Honolulu Chapter 21, Article 3, Table 21-3, Master Use Table, veterinary establishments are a permitted use in I-1 (Limited Industrial) and I-2 (Intensive Industrial). In addition, veterinary establishments are a permitted use in B-1 (Neighborhood Business), B-2 (Community Business), BMX-3 (Community Business Mixed Use), BMX-4 (Central Business Mixed Use), and IMX-1 (Industrial Mixed Use), subject to standards in ROH 21-5.

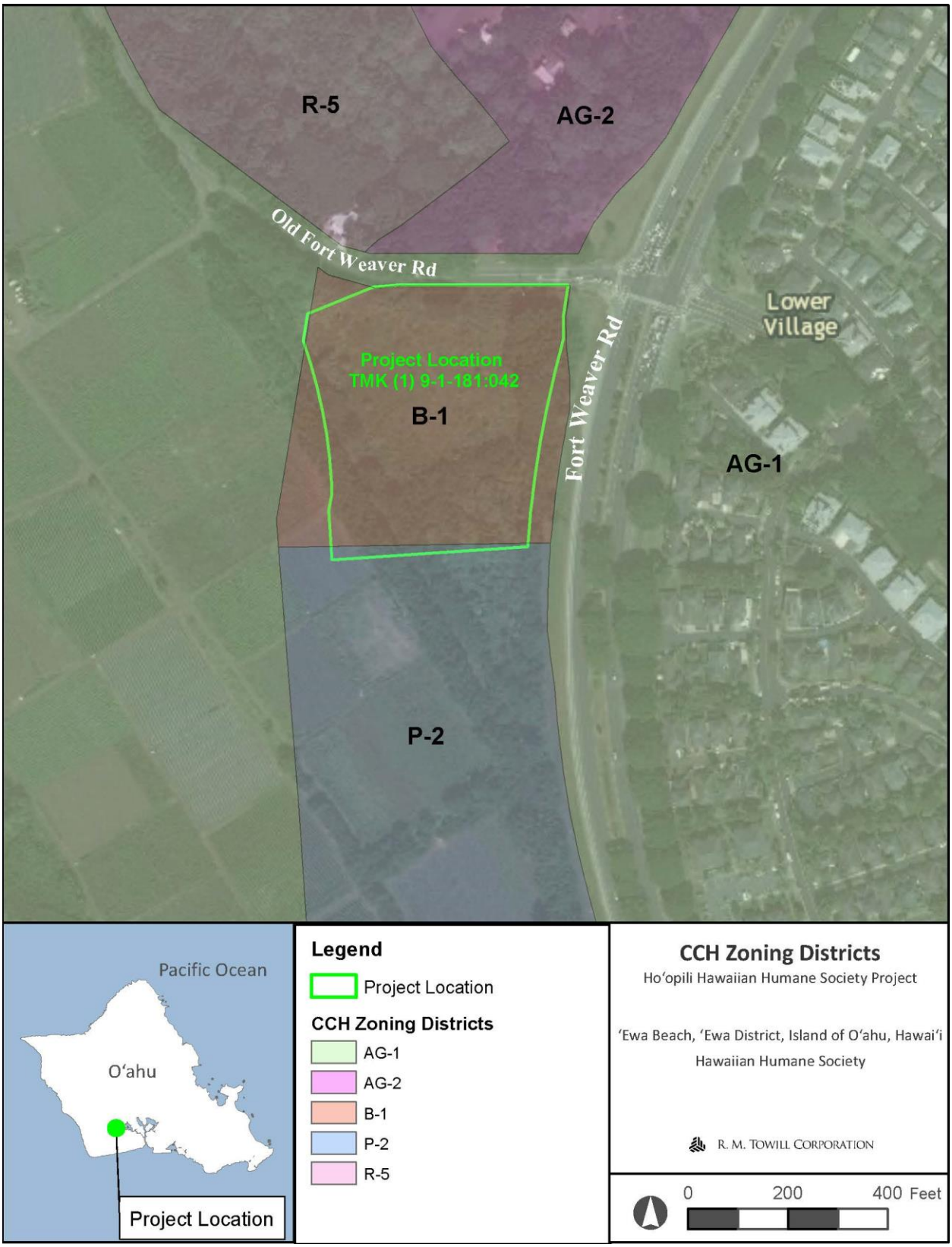
Discussion: The project is defined by the CCH Land Use Ordinance as a veterinary establishment with the development of the project occurring in zone B-1 (Neighborhood Business).

7.3.5 Special Management Area

The Special Management Area (SMA) was established to preserve, protect, and where possible, restore the natural resources of the coastal zone of Hawai‘i. Special controls on development within this area are necessary to avoid permanent loss of valuable resources and foreclosure of management options. The review guidelines of Section 25-3.2 of the Revised Ordinances of Honolulu are used by the DPP and the Honolulu City Council for the review of developments planned in the SMA. These guidelines are derived from Section 205A-26 HRS.

Discussion: The project site is not within the SMA defined by the CCH.

Figure 7-3. CCH Zoning Districts



Section 8
Permits and Approvals That May Be Required

8.1 Federal

Federal Aviation Administration Order 5190.6B

8.1 State of Hawaiʻi

Environmental Assessment and Finding of No Significant Impact under Hawaiʻi Revised Statutes, Chapter 343 (Approving Ageny: City and County of Honolulu, Department of Community Services)

Hawaiʻi Revised Statutes, Chapter 6E Review

Section 402, Clean Water Act, National Pollutant Discharge Elimination System Construction Storm Water (Department of Health, Clean Water Branch)

Americans with Disabilities Act Review (Department of Health, Disability and Communication Access Board)

Recycled Water Application (Department of Health, Wastewater Branch)

8.2 City and County of Honolulu

Grubbing, Grading and Stockpiling Permit (Department of Planning & Permitting)

Trenching Permit (Department of Planning & Permitting)

Street Usage Permit (Department of Transportation Services)

Traffic Control Plans (Department of Planning & Permitting)

Building Permit (Department of Planning & Permitting)

Plan Approval (Department of Planning & Permitting, Traffic Review Branch)

Plan Approval (Department of Transportation Services, Transportation Mobility Division)

Plan Approval (Honolulu Fire Department)

Recycled Water Service Agreement and Plan Approval (Board of Water Supply)

Section 9
Agencies, Organizations, and Individuals to be Consulted for the Environmental Assessment

The following agencies, organizations, and individuals will be contacted during the HRS, Chapter 343, environmental review process to disclose the environmental conditions of the site, the proposed undertaking, and the potential impacts and mitigation measures that will be applied to ensure against adverse impacts.

9.1 State of Hawaiʻi

Department of Land and Natural Resources:
- Commission on Water Resource Management
- Division of State Parks
- Division of Forestry and Wildlife
- Engineering Division
- State Historic Preservation Division
- Land Division – Oʻahu District
- Office of Conservation and Coastal Lands

Department of Education:

Department of Health:
- Clean Water Branch
- Environmental Planning Office
- Disability and Communication Access Board

Department of Business, Economic Development and Tourism, Office of Planning, Coastal Zone Management

Department of Accounting and General Services
- Public Works Division
- Hawaiʻi Community Development Authority

Department of Transportation

Office of Hawaiian Affairs

Department of Hawaiian Home Lands

9.2 City and County of Honolulu

Department of Planning and Permitting
- Director
- Planning Division
- Traffic Review Branch
- Floodplain Manager

Department of Community Services
Department of Design and Construction
Department of Environmental Services
Department of Facility Maintenance
Department of Parks and Recreation
Department of Customer Services
Department of Transportation Services
Honolulu Board of Water Supply
Emergency Services Department
Honolulu Fire Department
Honolulu Police Department
O'ahu Transit Services, Inc.
Office of the Mayor

9.3 Elected Officials, Organizations and Individuals

U. S. Senator Brian Schatz
U. S. Senator Mazie Hirono
State Senator Mike Gabbard – District 20
State Representative Rob McDermott – District 40
Councilmember Ron Menor – District 9
Hawaiian Electric Company, Inc.
'Ewa Neighborhood Board No. 23 Chair Mitchell Tynanes
Historic Hawaii Foundation
D. R. Horton
West Loch Fairways Association
Child and Family Services

9.4 Pre-Assessment Consultation for the Environmental Assessment

Pre-assessment consultation letters, dated November 9, 2020, were sent to the public and private agencies, organizations, and individuals to notify and initiate consultation for the preparation of the Chapter 343, HRS, EA for the project. The purpose of the pre-assessment consultations was to accomplish the following:

- Solicit input to help identify environmental and permitting issues to be considered and addressed in the upcoming EA; and
- Inform agencies, organizations, and individuals regarding planned activities in the area and the upcoming EA process.

A list of the comments received during the pre-assessment consultation is provided in **Table 9-1**.

Table 9-1. Comments Received During the Pre-Assessment Consultation for the EA

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
1	City and County of Honolulu, Honolulu Police Department	11/18/2020	Based on the information provided, the Honolulu Police Department (HPD) does not have any comments or concerns at this time. However, the HPD would like to be notified of any updates to the project to reassess its impact on police operations.	Section 5.13.4
2	City and County of Honolulu, Honolulu Fire Department	11/18/2020	The Honolulu Fire Department (HFD) reviewed the submitted information and requires that the following be complied with: 1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet (45 meters) from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.) A fire department access road shall extend to within 50 feet (15 meters) of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; 2012 Edition, Section 18.2.3.2.1.)	Section 5.13.5
			2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45,720 millimeters) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)	Section 5.13.5
			3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Sections 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)	Section 5.13.5
			4. Submit civil drawings to the HFD for review and approval.	Section 5.13.5 and 8.2
3	State Department of Transportation	11/19/2020	HDOT has the following comments: <u>Airports Division (HDOT-A)</u> 1. The HHS Hoopili Campus is approximately 3.28 miles from the property boundary of Kalaeloa Airport (JRF). All projects within 5 miles from Hawaii State airports are advised to read the Technical Assistance Memorandum (TAM) for guidance with development and activities that may require further review and permits. The TAM can be viewed at this link: http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf.	Section 7.1.1 and 8.2

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
			2. The HHS Hoopili Campus is approximately 19,694 feet from the end of Runway 22R at JRF. Federal Aviation Administration (FAA) regulation requires the submittal of FAA Form 7460-1 Notice of Proposed Construction or alteration pursuant to the Code of Federal Regulations, Title 14, Part 77.9, if the construction or alteration is within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet. Construction equipment and staging area heights, including heights of temporary construction cranes, shall be included in the submittal. The form and criteria for submittal can be found at the following website: https://oeaaa.faa.gov/oeaaa/external/portal.jsp.	Section 7.1.1 and 8.2
			3. Due to the proximity to the airport, HHS should be aware of potential single event noise from aircraft operations. There is also a potential for fumes, smoke, vibrations, odors, etc., resulting from occasional aircraft flight operations over the project location.	Section 5.9
			4. Although the project is located outside of the 55 DNL (Day-Night Average Sound Level) noise contours on the 2008 Noise Exposure Map for the Daniel K. Inouye International Airport, and the 55 DNL noise contours on the 1998 Noise Exposure Map for JRF, HHS should be aware of the proximity of the airport flight paths and potential single event noise from aircraft operations.	Section 5.9
			5. Detention basins have the potential to attract wildlife to standing water. The HDOT-A is concerned about the potential of wildlife attracted to the proposed detention basin and recommends that HHS incorporates appropriate measures to address wildlife. Furthermore, the FAA recommends a distance of five miles between the closest point of the airport's aircraft operations area and the hazardous wildlife attractant. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48-hour detention period after the design storm and to remain completely dry between storms. Please review the FAA Advisory Circular 150/5200-33C, Hazardous Wildlife Attractants On Or Near Airports for guidance. If the project results in a wildlife attractant, these effects shall be immediately mitigated by HHS upon notification by the HDOT-A and/or FAA.	Section 5.8.2 and 7.1.1
			<u>Highways Division (HDOT-HWY)</u> 1. HDOT-HWY provided comments on the subdivision application 2016/Sub-44 (July 20, 2016, HWY-PS 2.2781). In summary, we did not anticipate the subdivision or HHS use of the parcel would significantly impact State highways, subject to the following conditions that remain applicable: a. HSS coordinates with HDOT-HWY with respect to necessary permits and approvals for sidewalks and other improvements that would affect the State right-of-way (ROW). b. HSS provides a fence or appropriate barrier around their facility, in particular along the Fort Weaver Road frontage, to keep animals from entering the State highway.	Section 5.13.1

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
			2. No additional discharge of surface water run-off onto the State highway ROW is permitted. This includes the use of existing State drainage culverts and channels. All additional stormwater runoff from the project site shall be managed and mitigated onsite.	Section 5.4.1 and 5.13.1
			3. The Hoopili Master Plan required land use permits and approvals, including a Land Use District Boundary Amendment (Docket No. A06-771). The conditions attached to these approvals are typically transferred to new landowners. The Draft Environmental Assessment (EA) should include the following: a. A description of the difference between the Hoopili Master Plan proposed use of the site and the HHS proposed land use. b. A summary of Hoopili Master Plan commitments that are applicable to the HHS land use. The property conveyance documents should describe the conditions applicable to HHS.	Section 3.3 and 7.3.3
			4. The Draft EA traffic impact discussion should include the following: a. Location of roadways, bike paths, sidewalks and bus stops in the vicinity. b. Location of existing and proposed (interim and permanent) site access driveways and roadway realignments. c. Best available information regarding existing (pre-Covid-19) traffic conditions in the vicinity of the site. d. Project description, including the use of new or existing infrastructure within the HDOT ROW; operations and construction activities; hours of operation; the estimated number of vehicle trips to/from the site during peak traffic hours; and the potential use of pedestrian and bicycle routes to access the site, especially the community dog park. e. An assessment of the project's potential direct, secondary and cumulative impacts to State roadways, sidewalks, and bike routes (level of service and safety). f. A discussion of the project's impact on the assumptions and findings of the most recent Hoopili Master Plan Traffic Impact Assessment Report (TIAR).	Section 5.13.1
			5. If the qualitative traffic assessment suggests a potential for adverse impact to State highways, include a TIAR prepared by a licensed Professional Engineer for HDOT review.	Section 5.13.1
4	State Department of Accounting and General Services	11/20/2020	The proposed project does not impact any of the Department of Accounting and General Services' existing facilities in the area, and we have no comments to offer at this time.	N/A
5	State Department of Health, Clean Air Branch	11/20/2020	Please see our standard comments at: https://health.hawaii.gov/cab/files/2019/08/Standard-Comments-Clean-Air-Branch- 2019.pdf	Section 5.10

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
6	City and County of Honolulu, Department of Transportation Services	11/23/2020	We have the following comments. 1. Transportation Impact Assessment (TIA). The applicant should perform a TIA to examine the vehicle, pedestrian, bicycle, and public transit stress and comfort levels at the nearby intersections and driveways with corresponding improvements to mitigate these impacts by applying Complete Streets principles. The applicant shall discuss the future year growth rate, trip distribution, mode split, and route assignment assumptions used in the TIA. The applicant shall submit all native files (e.g., Synchro, Excel, etc.) for the raw multi-modal counts and accompanying analyses to the Regional Planning Branch at dtsplanningdiv@honolulu.gov. Please refer to the Department of Transportation Services (DTS) TIA Guide for multimodal assessment tools and recommended analyses. The TIA Guide can be found at http://www4.honolulu.gov/docushare/dsweb/View/Collection-7723.	Section 5.13.1
			2. Street Usage Permit. A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane or pedestrian mall on a City street.	Section 5.13.1 and 8.2
			3. Neighborhood Impacts. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandiVan), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.	Section 9
			4. Bus Stops. The project site is in the immediate vicinity of bus stops. Submit project plans to DTS - Transportation Mobility Division (TMD) for review and approval. Contact DTS-TMD at TheBusStop@honolulu.gov.	Section 5.13.1 and 8.2
			5. Disability and Communication Access Board (DCAB). Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act (ADA) requirements.	Section 5.13.1, 7.2.1, and 8.2
7	State Department of Education	11/23/2020	The proposed action is not anticipated to impact HIDOE schools or facilities.	Section 5.13.7
8	City and County of Honolulu, Department of Planning and Permitting	11/23/2020	We have reviewed the proposal and note that the Draft EA should include discussions on the proposed project's conformance with the following: 1. Objectives and policies of the General Plan; 2. Policies and guidelines of the Ewa Development Plan and how it will assist in fulfilling the long-term vision for the Ewa region; 3. Guidelines of the Hoopili Urban Design Plan, especially, but not limited to, building design, building siting, landscaping, and street trees. This discussion may have to include coordination with the developer's (D.R. Horton) plans to improve Old Fort Weaver Road and the extension of Keahumoa Parkway to Old Fort Weaver Road; and 4. Permitted uses and development standards of underlying zoning district.	Section 5.13.1 and 7.3

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
			The Draft EA should also include a discussion on the potential traffic impact to the roadways in the region, as well as bicycle and pedestrian access to the project site.	Section 5.13.1
9	State Department of Land and Natural Resources, Division of Forestry and Wildlife	11/23/2020	State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*) and Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the O'ahu DOFAW Office at (808) 973-9778.	Section 5.8.2
			DOFAW is concerned about attracting vulnerable birds to areas that may host nonnative predators such as cats, rodents, and mongoose. Additionally, improvements to the facility are likely to increase human activity and may generate more trash and other predator attractants. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.	Section 5.8.2
			The State endangered Hawaiian Short-eared Owl or pueo (*Asio flammeus sandwichensis*) has the potential to occur in the project site vicinity. Pueo are a crepuscular species, most active during dawn and dusk twilights. DOFAW recommends twilight pre-construction surveys by a qualified biologist prior to clearing vegetation. If pueo nests are present, a buffer zone should be established in which no clearing occurs until nesting ceases, and DOFAW staff should be notified.	Section 5.8.2
			The State listed Hawaiian Hoary Bat or 'Ope'ape'a (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.	Section 5.8.2
			DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens, vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the O'ahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.	Section 5.8.2

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
			We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawai'i please visit: https:/ /dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.	Section 5.8.2
			DOFAW recommends surveying for rare and endangered plants that may occur in the area. If any of these species are found, please notify DOFAW at (808) 587-0166.	Section 5.8.2
10	City and County of Honolulu, Department of Parks and Recreation	11/30/2020	The Department of Parks and Recreation strongly supports this project as an important resource for the community and region.	Section 5.13.8
11	State Department of Land and Natural Resources, Engineering Division and Land Division	12/3/2020	<u>Engineering Division</u> The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards. The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA'a Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT). If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below: Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.	Section 5.7
			<u>Land Division</u> We have no comments.	N/A
12	City and County of Honolulu, Board of Water Supply	12/7/2020	The existing water system cannot provide adequate off-site fire protection to the proposed development. The Board of Water Supply (BWS) Water System Standards (WSS) require a fire hydrant spacing of 250 feet in the vicinity of the veterinarian/medical facilities and provide a flow of 2,000 gallons per minute (gpm). The nearest fire hydrant, Fire Hydrant No. L-00701, is approximately 300 linear feet away from the project site. Therefore, in accordance with our BWS WSS, the developer will be required to install fire hydrants with 250 foot spacing in the vicinity of the proposed project that can provide a flow of 2,000 gpm.	Section 5.13.2 and 5.13.5

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
			The construction drawings shall be submitted for our review and approval, and the construction schedule shall be coordinated with BWS to minimize impact on our water system.	Section 5.13.2 and 8.2
			When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.	Section 5.13.2
			Water conservation measures are required for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.	Section 5.13.2
			The BWS has a R-1 waterline running along the east boundary of the parcel, along Fort Weaver Road. The BWS will require a waterline easement to be granted in favor of the BWS. Any structures should be adequately set back from the waterline easements for the safety of the homeowners and public and to prevent damage to the structures in the event of main breaks, repair, and maintenance.	Section 5.13.2
			The BWS Rules and Regulations Section 1-112 requires nonpotable water for the irrigation of large landscaped areas. The proposed humane society development is adjacent to the BWS Recycled Water System. Thus, nonpotable water in the form of recycled water, which is designated R-1, must be used and the BWS agrees to provide R-1 recycled water to the development.	Section 5.13.2
			Connection to the BWS Recycled Water System is available along the east boundary of the parcel, along Fort Weaver Road.	Section 5.13.2
			In order to use recycled water, the user shall comply with Chapter 11-62, Hawaii Administrative Rules, Wastewater Systems. The user shall be required to prepare and submit to the Department of Health (DOH) Wastewater Branch a recycled water application form found in Appendix C of the DOH Volume 2 of the Reuse Guidelines dated January 2016. The user shall be responsible for any permitting, training, and on-site improvements, and any associated costs, as may be required by the DOH. The delivery of recycled water is contingent on the user obtaining DOH approval to use recycled water at the subject project and submitting a copy of the DOH approval to BWS. Once the application is reviewed and deemed satisfactory, the DOH will issue an approval to construct. The user must send the approval to construct letter to BWS before the plans can be approved.	Section 5.13.2 and 8.1
			The availability of recycled water will be confirmed when the Recycled Water Service Agreement (RWSA) between the BWS and the user is executed, and construction plans have been approved by the BWS. BWS reserves the right to change any position or information stated herein up until the execution of the RWSA and approval of the construction plans. When recycled water is made available the user shall be required to pay any applicable costs for its use.	Section 5.13.2

No.	Commentor	Date of Letter	Comments	Draft EA Reference Sections
			A water meter will be required for recycled water service. Meter sizing and installation shall be coordinated with the BWS as described in the RWSA. If applicable, the user shall be responsible for obtaining the necessary easements, permits, and clearances and preparing any construction plans for the connection to the BWS recycled water system.	Section 5.13.2
			The BWS R-1 Effluent system utilizes a variable speed pumping system with no elevated storage reservoirs at this time. Therefore, pump running times and water pressures will vary depending on climate, water demand, and efficient pumping operation strategies and time of day. The Customer shall be placed on a time schedule, usually at night, and shall make reasonable accommodations to allow for a defined range of system pressures. A receiving tank and booster pump may be required to supply adequate pressures to the irrigation system; however, this should be verified with the BWS.	Section 5.13.2
			The proposed project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.	Section 5.13.2
			The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.	Section 5.13.5 and 8.2
13	City and County of Honolulu, Department of Design and Construction	12/16/2020	The Department of Design and Construction does not have any comments at this time.	N/A
14	Hawaiian Electric Company	12/17/2020	Hawaiian Electric Company has no objection to the project. Hawaiian Electric has existing easements and facilities on the subject property, we will need continued access for maintenance of our facilities. Please show the existing electrical facilities on your design plans. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Hawaiian Humane Society Ho'opili Campus project comes to fruition, please continue to keep us informed.	Section 5.13.2

All written comments received during the pre-assessment consultation were responded to through the content of the Draft EA. The full record of the pre-assessment consultations completed for this project is provided in **Appendix H**.

An opportunity for public comments will also follow the publication of this Draft EA with the OEQC. All relevant written public comments received during the 30-day public comment period will receive a written response for inclusion and use in the preparation of the project's forthcoming Final EA.

9.5 Draft Environmental Assessment Comments and Responses

This section is reserved for written comments and responses for the Draft EA.

Section 10
Summary of Effects

In accordance with the content requirements of HRS, Chapter 343, and the significance criteria in HAR, Section 11-200.1-13, an applicant or agency must determine whether an action may have significant impacts on the environment, including all phases of the project, its expected consequences both primary and secondary, cumulative impact with other projects, and short- and long-term effects.

HAR, Section 11-200.1-24 requires a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Short-term and long-term do not necessarily refer to fixed time periods but are viewed relative to environmentally significant consequences of the proposed action. **Sections 10.1** and **10.2** below discuss the extent to which the proposed action involves trade-offs among short-term and long-term gains and losses, as well as the extent to which the proposed action forecloses future options and/or narrows the range of beneficial uses of the environment.

In making the determination of whether an action may have significant impacts on the environment, HAR §11-200.1-13 established "Significance Criteria" to be applied as a basis for identifying whether significant environmental impacts will occur. According to the HAR §11-200.1, an action shall be determined to have a significant impact on the environment if it meets any one of the criteria. The relationships of the proposed action to the criteria are discussed below in **Section 10.3**. See **Table 10-1** at the end of this section for a summary of impacts and proposed mitigation.

10.1 Short Term Effects

The short-term effects associated with the proposed project will be principally during the construction phase. Noise will be temporarily generated from construction activities and the related mobilization of equipment. Construction equipment is expected to include, but not be limited to backhoe(s), loader(s), excavator(s), work trucks, and powered hand tools. All internal combustion-powered equipment will be muffled in accordance with standard engine operating practices. Upon the completion of work, noise levels will return to pre-existing ambient levels.

Fugitive dust may be generated during construction. The contractor will be required to control fugitive dust through the regular wetting of soils and ground areas susceptible to the generation of dust during work activities. Only enough water will be used to wet the surface of ground areas and prevent the generation of runoff.

Protection of water quality will be through the use of mitigative measures including silt fencing/curtains, berms, and other applicable erosion controls to prevent construction storm water related soils and silt from leaving active areas of work. Specifications for the use of these measures will be through the construction plan approval process and NPDES permit application that will be filed by the design consultant during the design phase.

Upon completion of work all construction equipment, machinery, and personnel will be demobilized from the job site with no further disturbance to the area. All debris and waste materials will be disposed of at an approved refuse facility. Active work areas will be replanted with native and indigenous vegetation where possible.

10.2 Long Term, Secondary, and Cumulative Effects

Potential long-term direct, secondary, and cumulative impacts have been evaluated and are documented for the following resources or issues: land use; land ownership; public health and safety; roadways and traffic; utilities; public facilities and services; topography, geology, and soils; hydrology; natural hazards; climate and air quality; noise; visual resources; marine environment; terrestrial flora and fauna; cultural resources; and socioeconomics. Of these resources and issues evaluated, the following long-term direct, secondary, and cumulative impacts are potentially significant.

Surface Water, Drainage, and Water Quality. The increase in impermeable surface area from the development of the proposed project is expected to be negligible and no impacts to the existing swale that runs along Fort Weaver Road are expected. The project will meet storm water quality requirements through the use of a detention basin and structural methods. Proposed drainage improvements within the project area include an underground culvert system comprised of two 36-inch diameter pipes and an approximately 25,500 cubic foot on-site detention basin near the north-eastern corner of the project site. The detention basin would promote on-site infiltration of surface water and facilitate groundwater recharge, and manage and mitigate all additional stormwater runoff from the project site to keep the rate of discharge to the State box culvert north of the project site below existing levels. Accordingly, surface runoff is not expected to result in significant adverse impacts.

Within the next 20 years, additional development will occur north of the project site including a new roadway. In order to convey future storm water runoff, a 50-foot setback along the northern property line will be reserved for extension of the existing box culvert.

To conserve water resources over the long-term HHS will continue to work with the BWS to utilize the R-1 system along Fort Weaver Road to irrigate parts of the site and other non-potable water purposes at the site to the extent practicable to ensure the health and safety of the HHS animals.

The proposed project is expected to result in positive long-term and secondary impacts by providing environmental benefits in the form of reduced discharges of storm water associated sediments in runoff, and improved visual aesthetics by the anticipated facilitation of irrigation water for new landscaping in the public spaces provided at the site. The potential for significant adverse cumulative impacts are not anticipated.

Visual Resources. The Ho‘opili HHS project site is not currently situated in an area that would obstruct any panoramic views identified in the ‘Ewa DP. The proposed project would not be visible from the H-1 Freeway and would not block makai views of the shoreline or mauka views of the Wai‘anae Range. While the proposed facility would be visible from the portions of Old

Fort Weaver Road and Fort Weaver Road fronting the proposed site it would not obstruct important viewsheds. Landscaping consisting of screening trees would be planted to mitigate visual impacts from Old Fort Weaver Road and Fort Weaver Road.

In the future, the ʻEwa DP will bring development up to the proposed site. The planned developments will permanently replace the open space character of the area with a master-planned community as viewed from the existing surrounding communities, including, but not limited to, the communities of Waipahu, West Loch, Honouliuli, ʻEwa Villages, ʻEwa, Villages of Kapolei and Makakilo. No significant long-term or secondary impacts to panoramic views from this future development are expected. Because population growth and associated construction in the area are anticipated to occur with or without the implementation of the proposed project no significant adverse cumulative impacts to visual resources are expected.

Socio-Economics. There would be positive long-term and secondary impacts in the areas of social benefit from the development of the proposed project. With the populations of both humans and animals in West Oʻahu growing, facilitated by the CCH ʻEwa DP with a focus on the steady urbanization in the Secondary Urban Center, there is an increased demand for HHS services in the ʻEwa region. More than 60 percent of West Oʻahu residents currently have pets and that number is expected to increase over time. The new facility would allow for HHS to serve the growing populations in West Oʻahu and other areas outside of Honolulu's urban core who may be unable to access the existing Mōʻiliʻili campus. Once constructed, the proposed HHS Hoʻopili campus is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mōʻiliʻili campus where the administrative functions will continue to be housed.

Implementation of the proposed project will result in potential secondary impacts by stimulating local business enterprises and increasing local employment. The combined increased business activities will result in increased state revenues, in the form of excise, individual, and corporate taxes. Combined with other past, present, and reasonably foreseeable future actions the proposed project would support the local economy and anticipated increased area population of both animals and humans. Because population growth on Oʻahu is anticipated to occur with or without the implementation of the proposed project no significant adverse cumulative impacts to the socio-economic environment are expected.

With or without the proposed action, the need for HHS services would increase with the anticipated future growth of the State. Long-term gains resulting from the development of the proposed project include allowing the HHS to maintain improved environments for the animals in its care which, among other things, 1) minimizes stress on the animals, employees, and volunteers, 2) improves the health and welfare of the animals at the facility, and 3) reinforces positive animals behavior, all of which positively impact successful animal adoption outcomes.

The project itself would not lead to plans for future uncontemplated construction but will support existing and projected HHS service needs on the island of Oʻahu. The proposed project is consistent with the long-range goals, policies, and objectives articulated in policy documents.

Public Facilities and Services: The project is not expected to have long-term adverse effects on public roadways or traffic. The project is being constructed in the Hoʻopili Master Planned Community which has been designed to be walkable/bikeable and transit-ready to reduce traffic impacts. Once fully constructed, the Hoʻopili Master Planned Community will include transit-oriented development, bus lines, wider streets, and increased connectivity to encourage pedestrian and bicycle movement and use of rapid transit and buses.
As part of the Hoʻopili Master Plan, improvements will be made to Old Fort Weaver Road which includes realignment and widening. A future roadway named Keahumoa Parkway will be constructed along the west portion of the HHS project site, running parallel to Fort Weaver Road. At that time, a future driveway to access the Hoʻopili HHS campus may be constructed along Keahumoa Parkway and will be designed to comply with CCH regulations. Keahumoa Parkway will meet up with a segment of the realigned Old Fort Weaver Road at a new intersection. These improvements are part of Phase IV of the Hoʻopili Master Plan which may not occur for another 20 years. Because development in the area is anticipated to occur with or without the implementation of the proposed project no significant adverse cumulative impacts to public roadways or traffic are expected.

The Hoʻopili HHS campus is expected to accommodate the needs of approximately half the population of Oʻahu so that residents of West and Central Oʻahu will not need to drive to Honolulu for HHS services. It is expected as the Hoʻopili Master Planned Community and the City of Kapolei develop over the years, east-west vehicular traffic to and from Honolulu will gradually adjust and the new Hoʻopili HHS campus will help to support this.

The project is located in an area that is adequately served by public services and facilities, including police and fire protection, and health care and emergency services. The proposed project would not significantly affect the existing level of service. The potential (less than significant) impacts associated with the future use of the site would not alter the ability of fire or police protection or health care and emergency services from providing an adequate level of service in the project environs and would not place an undue burden on the public facilities that would support the project. Future development of the surrounding area will increase the population and the demand for public services and future police substations, fire stations, and/or EMS sites are planned. No significant adverse cumulative impacts to police and fire protection, and health care and emergency services are expected.

The proposed project is expected to result in positive long-term and secondary impacts by providing an off-leash dog park for use by HHS and the public for dogs to walk, run, play, and socialize and a meeting space for the community. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort. The planned project will not increase the population in the vicinity and will not create additional long-term use of State and County recreational facilities. Future development of the surrounding area will increase the population and the demand for recreational resources and future recreational facilities in the area are planned. Because population growth on Oʻahu is anticipated to occur with or without the implementation of the proposed project no significant adverse long-term, secondary, or cumulative impacts to recreational resources are expected.

10.3 Significance Criteria

In accordance with the provisions set forth in HRS, Chapter 343, and the significance criteria in HAR, Chapter 11-200.1-13, this Draft EA has preliminarily determined that the project will have no significant adverse impact to air and water quality, existing utilities, noise, archaeological or cultural sites, or wildlife habitat. All anticipated impacts will be temporary and will not adversely impact the environmental quality of the area.

According to the Significance Criteria:

1. Irrevocably commit a natural, cultural, or historic resource;

Discussion: No adverse impact to natural, cultural, or historic resources is anticipated. Impacts are addressed in-depth in **Sections 5 and 6**.

As detailed in **Sections 5.14 and 6** of the EA, an AIS and CIA were conducted for the planned Ho‘opili Community project. The results of the field inspection were consistent with what was expected based on background research and previous archaeological studies conducted in the vicinity. No historic properties were identified within the HHS Ho‘opili project site or are expected based on past land use for agricultural purposes. Further, the specific land uses involving the development of the proposed HHS Campus will require plan review and clearance of the construction plans for the project by the SHPD. In accordance with HRS, Chapter 6E, SHPD will be consulted regarding the proposed project's potential to impact historic resources and the necessity for further project-related historic preservation. The HHS is presently pursuing this process and anticipates concurrence with no effect to the project site. This process is expected to be completed following this HRS, Chapter 343, EA process. The project will comply with the requirements of the SHPD. Additionally, no adverse impact to cultural practices or beliefs is expected as there are currently no contemporary or continuing cultural or traditional practices occurring within the project area.

In the event that historic resources, including structural remains, subsurface cultural deposits, or human skeletal remains, are identified during the construction project, cease all work in the immediate vicinity of the find, protect the find from additional disturbance, and contact the SHPD at (808) 692-8015.

2. Curtail the range of beneficial uses of the environment;

Discussion: The Ho‘opili HHS project will not curtail the range of beneficial uses of the environment. The proposed action involves the use of land within the Urban State Land Use District and CCH B-1 (Neighborhood Business) zone and is consistent with these designations. The proposed project will help to accommodate the increased HHS service needs of the area by providing a facility in West O‘ahu. The project will provide necessary support services for the orderly growth of this region.

3. Conflict with the State's environmental policies or long-term environmental goals established by law;

Discussion: The proposed project is consistent with the environmental policies, goals, and guidelines as delineated in HRS, Chapter 344, and as documented in this EA.

4. Have a substantial adverse effect on the economic welfare, social welfare, or cultural practices of the community and State;

Discussion: No adverse impact to economic, social welfare, or cultural practices are expected. Short-term labor costs will provide a positive but limited economic impact on the construction industry. Long-term economic benefits are expected from the creation of new jobs for the operation of the new facility. The Hoʻopili HHS project will not have a direct effect on population growth statewide, however, it will support the growing population and increased HHS service needs of the area by providing a facility in the West Oʻahu.

5. Have a substantial adverse effect on public health;

Discussion: The proposed project will be developed in accordance with Federal, State, and County of Hawaiʻi, rules and regulations governing public safety and health. During project activities, there will be the potential for minor impacts to air quality, noise levels, and the generation of storm water runoff, which will be addressed through the application of appropriate mitigation measures as described in this EA. No substantial adverse impacts to public health are anticipated.

6. Involve adverse secondary impacts, such as population changes or effects on public facilities;

Discussion: Secondary impacts such as population changes are not expected. The overall impact of the project will be a beneficial effect as it will allow HHS to more efficiently serve the growing population of West Oʻahu. The proposed HHS Hoʻopili campus will accommodate the needs of approximately half the population of Oʻahu and will work in concert with the existing HHS Mōʻiliʻili campus. Because population growth on Oʻahu is anticipated to occur with or without the implementation of the proposed project no significant adverse impacts are expected.

7. Involve a substantial degradation of environmental quality;

Discussion: The proposed project will be developed in accordance with the environmental policies of HRS, Chapter 343. The analysis provided in this EA indicates that no substantial environmental degradation is anticipated or expected.

8. Be individually limited but cumulatively have substantial adverse effect upon the environment or involves a commitment for larger actions;

Discussion: The project will not have a considerable effect on the environment and will not cause a commitment to larger actions. Within the next 20 years, additional development will occur north of the project site including a new roadway. Additionally, to convey future storm

water runoff, a 50-foot setback along the northern property line will be reserved for the extension of an existing box culvert. These future actions are planned as part of the project and planned future development in the area. Other projects in the area will be closely coordinated to minimize the potential for cumulative impacts.

9. Have a substantial adverse effect on a rare, threatened, or endangered species, or its habitat;

Discussion: As detailed in **Section 5.8** of the EA, flora, faunal, and arthropod surveys were conducted for the planned Ho‘opili Community project. No significant adverse impacts to rare, threatened, or endangered species or habitat are expected to occur as a result of the project.

10. Have a substantial adverse effect on air or water quality or ambient noise levels;

Discussion: General temporary impacts associated with construction have been identified in this EA. Mitigation measures as described in this EA will be applied during the on-going construction activity. No detrimental long-term impacts to air, water, or acoustic quality are anticipated to occur with the development of the Ho‘opili HHS project.

11. Have a substantial adverse effect on or be likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, sea level rise exposure area, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;

Discussion: The project is not located in an environmentally sensitive area. No impact is anticipated.

12. Have a substantial adverse effect on scenic vistas and viewplanes, during day or night, identified in county or state plans or studies;

Discussion: The site is not situated in an area that would detract from any panoramic views identified in the ‘Ewa DP. In the future, the ‘Ewa DP will bring development up to the proposed site. Panoramic views from this future development are not expected to be impacted by the project. To avoid attracting endangered, night-flying seabirds, lighting used during construction would be shielded and downward facing, which will also serve to minimize any visual obtrusiveness of the site to surrounding properties. **Section 5.11** describes the potential for visual impacts and mitigation measures.

13. Require substantial energy consumption or emit substantial greenhouse gases.

Discussion: Construction activities that require the use of heavy machinery would present an increase in greenhouse gases, however, this would only be short-term and cease with construction. The energy that is used will be in the form of fossil-fueled internal combustion equipment, machinery, and vehicles, and electricity supplied to the site by either an existing Hawaiian Electric Company-power connection or by the use of portable generator(s). Once constructed, the facilities identified in the proposed project will not consume a substantial

amount of energy. The use of the proposed forms of energy is not expected to be greater or significantly greater than that used for the development of similar projects.

Table 10-1. Hoʻopili HHS Project Impacts Summary

Resource Area	Potential Short-term Impacts	Long-term Impacts	Cumulative Impacts	Mitigation and BMPs	EA Section
Climate	Construction activities that require the use of heavy machinery would present a short-term increase in greenhouse gases.	No Adverse Impact.	Minimal Cumulative Impact - because the direct impact to climate would be only short-term, and would not increase the use of machinery, the project would make no persistent contribution to cumulative impacts.	No Mitigation required.	5.1 Climate 5.7 Natural Hazards
Geology, Topography, and Soil Resources	Ground disturbing activities (i.e., during construction).	No Adverse Impact.	No Cumulative Impact.	• Erosion control measures will be employed during construction. • Site restoration to original condition at conclusion of the project. • Disposal will be at an approved facility or location in accordance with Federal, State, and County regulations.	5.3 Geology and Topography 5.5 Soils and Potential for Hazardous Materials
Groundwater and Surface Water	Potential storm water runoff during construction. Localized and potential increase in turbidity.	No Adverse Impact.	No Cumulative Impact.	• Construction will be regulated through NPDES permit conditions in accordance with CWA regulations. • During construction, work activities will be in compliance with HAR 11-54 WQS and HAR 11-55 Water Pollution Control. • Discharge pollution prevention measures will be employed in all phases of the project. • Following construction, all areas of ground disturbance will be stabilized with appropriate materials including the use of vegetative ground cover.	5.4 Water Resources and Hydrology
Wetlands	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	No Mitigation required.	5.6 Wetlands
Natural Hazards	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	No Mitigation required.	5.7 Natural Hazards
Terrestrial Flora	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	• Minimize the movement of plant or soil material between worksites, where possible, and clean excess soil and debris from all equipment, materials, and personnel to mitigate the spread of any high-risk invasive species in the area.	5.8.1 Terrestrial Flora

Resource Area	Potential Short-term Impacts	Long-term Impacts	Cumulative Impacts	Mitigation and BMPs	EA Section
Terrestrial Faunal and Avifaunal Resources	Increased lighting during construction of the proposed project.	No Adverse Impact.	No Cumulative Impact.	• Site clearing should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW. • If any State listed waterbird species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, the O'ahu DOFAW Office should be contacted at (808) 973-9778. • Prior to the start of grubbing/grading, a qualified biologist should complete a survey of the area to be disturbed to be sure that no nesting pueo are present. In the event that a nest is located, a buffer zone should be established in which no clearing occurs until nesting ceases, and DOFAW staff should be notified. • Light fixtures utilized for this project will be designed and installed to reduce glare and shield light from migrating and/or nocturnally flying seabirds. As possible, night-time work during the peak of seabird fallout between September 15 and December 15 should be avoided to minimize adverse impacts to listed seabird species that might overfly the project vicinity. • In accordance with HRS, Chapter 205A-30.5(b) and 205A-71(b) artificial lighting provided for operations, security, and public safety will be properly positioned and shielded to minimize adverse impacts. • Design features for lighting will be based on guidance in "The Newell's Shearwater Light Attraction Problem, A guide for Architects, Planners, and Resort Managers."	5.8.2 Terrestrial Fauna

Resource Area	Potential Short-term Impacts	Long-term Impacts	Cumulative Impacts	Mitigation and BMPs	EA Section
Noise	Temporary source of noise above ambient levels from construction noise.	No Adverse Impact.	Minimal Cumulative Impact – other past, present, and reasonably foreseeable future actions are expected to be consistent with existing development and the direct impact to noise would only be short-term, the project would make no persistent contribution to cumulative impacts.	• Construction vehicles and machinery, and all noise attenuation equipment maintained in good operating condition. • During construction, work activities will be in compliance with HAR, Chapter 11-59, and 11-60.	5.9 Noise Conditions
Air Quality	Temporary and localized emissions from increased fugitive dust and odors arising from construction-related equipment, and vehicles.	No Adverse Impact.	Minimal Cumulative Impact – because the direct impact to air quality would be only short-term, the project would make no persistent contribution to cumulative impacts.	• Construction equipment and vehicles shall be maintained in proper working order to reduce air emissions. • During construction, work activities will be in compliance with HAR, Chapter 11-59, and 11-60. • Fugitive dust will be controlled with regular wetting of the soil by the contractor and/or by the use of dust screens, as required.	5.10 Air Quality
Visual Resources	Temporary visual impacts from the presence of construction equipment and construction activities.	No Adverse Impact.	Minimal Cumulative Impact – other past, present, and reasonably foreseeable future actions are expected to be consistent visually with existing and planned development. Landscaping consisting of screening trees would be planted to mitigate visual impacts from Old Fort Weaver Road and Fort Weaver Road.	• Equipment will be confined to work areas. • All construction-related equipment will be removed following the completion of work.	5.11 Visual Resources
Socio-Economic Environment and Demographics	No Adverse Impact.	No Adverse Impact.	Minimal Cumulative Impact – other past, present, and reasonably foreseeable future actions are expected to support the local economy and anticipated increased area population. Because population growth on Oʻahu is anticipated to occur with or without the implementation of the proposed project no significant adverse cumulative impacts are expected.	No Mitigation required.	5.12 Socio-Economic Environment and Demographics
Transportation Facilities	Potential for limited, non-substantial short-term effects on transportation due to construction activities near the job site.	No Adverse Impact.	Minimal Cumulative Impact – other past, present, and reasonably foreseeable future actions are expected to be consistent with the transportation use of the existing development.	No Mitigation required.	5.13.1 Roads and Transportation
Electrical, Water, and Wastewater	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	No Mitigation required.	5.13.2 Utilities

Resource Area	Potential Short-term Impacts	Long-term Impacts	Cumulative Impacts	Mitigation and BMPs	EA Section
Solid and Hazardous Waste	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	• Disposal of solid waste will be handled in accordance with applicable Federal, State, and CCH rules and regulations.	5.13.3 Solid Waste
Police, Fire, Health Care and Emergency Services	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	No Mitigation required.	5.13.4 Police Protection 5.13.5 Fire Protection 5.13.6 Health Care and Emergency Services
Schools and Libraries	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	No Mitigation required.	5.13.7 Schools and Libraries
Recreational Facilities	No Adverse Impact.	No Adverse Impact.	No Cumulative Impact.	No Mitigation required.	5.13.8 Recreational Facilities
Archaeological and Cultural Resources	Potential for inadvertent discovery of cultural deposits and iwi kūpuna.	No Adverse Impact.	No Cumulative Impact.	• In accordance with HRS, Chapter 6E, SHPD will be consulted regarding the proposed project's potential to impact historic resources and the necessity for further project-related historic preservation. The project will comply with the requirements of the SHPD.	5.14 Archaeological and Cultural Resources
Traditional Cultural Practice	Potential for inadvertent discovery of cultural deposits and iwi kūpuna.	No Adverse Impact.	No Cumulative Impact.	• In accordance with HRS, Chapter 6E, SHPD will be consulted regarding the proposed project's potential to impact historic resources and the necessity for further project-related historic preservation. The project will comply with the requirements of the SHPD.	6.0 Cultural Impact Assessment

Section 11
Summary of Findings and Significance Determination

In accordance with the provisions set forth in HRS, Chapter 343, and the significance criteria in HAR, Chapter 11-200.1-13, this EA has evaluated and assessed the potential for environmental impacts associated with the proposed project and it is preliminarily determined that a HRS, Chapter 343, Environmental Impact Statement will not be required.

The proposed Ho‘opili HHS project is not expected to result in significant adverse impacts to geology, soils, hydrology, stream flow, biological resources, air quality, natural hazards, cultural resources, socioeconomics, or land uses. Minimal impacts may consist of minor traffic, noise, and air quality disturbances businesses and residents in the area that may traverse the immediate surrounding location of the project site but will completely cease once construction is completed.

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Appendices

Appendix A	Analysis of Projected Animal Sheltering Services for Hawaiian Humane Society's Mōʻiliʻili and Second Facilities, Letter Report. Prepared for Hawaiian Humane Society. Prepared by Helber Hastert & Fee Planners Inc. May 2011.
Appendix B	Botanical Resources Assessment for the Hoʻopili Project, Honolulu, Oʻahu. Prepared for PBR Hawaiʻi & D.R. Horton – Schuler Division. Prepared by LeGrande Biological Surveys Inc. August 2006.
Appendix C	A Survey of Avian and Mammalian Resources for the Ho'opili Development Project, 'Ewa District, O'ahu, Hawai'i. Prepared for PBR Hawaiʻi. Prepared by Rana Productions, Ltd. February 2008.
Appendix D	Arthropod Survey and Assessment Ho'opili Project, 'Ewa District, O'ahu, Hawai'i. Prepared for PBR Hawaiʻi & D. R. Horton – Schuler Division. Prepared by Pacific Analytics, L.L.C. May 2008.
Appendix E	An Archaeological Inventory Survey for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu. Prepared for D. R. Horton - Schuler Division. Prepared by Cultural Surveys Hawai'i, Inc. July 2006.
Appendix F	Cultural Impact Assessment for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu. Prepared for D. R. Horton - Schuler Division. Prepared by Cultural Surveys Hawai'i, Inc. December 2006.
Appendix G	Reserved for Traffic Impact Assessment
Appendix H	Pre-Assessment Consultation Letters for Hawaiʻi Revised Statutes, Chapter 343.

Appendix A

Analysis of Projected Animal Sheltering Services for Hawaiian Humane Society's Mōʻiliʻili and Second Facilities, Letter Report. Prepared for Hawaiian Humane Society. Prepared by Helber Hastert & Fee Planners Inc. May 2011.

Helber Hastert & Fee
Planners, Inc.

May 19, 2011

Ms. Pamela Burns, President
Hawaiian Humane Society
2700 Waialae Avenue
Honolulu, Hawaii 96826

Dear Ms. Burns,

Analysis of Projected Animal Sheltering Services for
Hawaiian Humane Society's Moi'li'ili and Second Facilities
LETTER REPORT

We are pleased to submit this letter report summarizing the findings of our analysis of projected near-term (2015) and long-term (2030) demand for the Hawaiian Humane Society's services at its existing Moi'li'ili facility and proposed second facility in 'Ewa.

I. PURPOSE

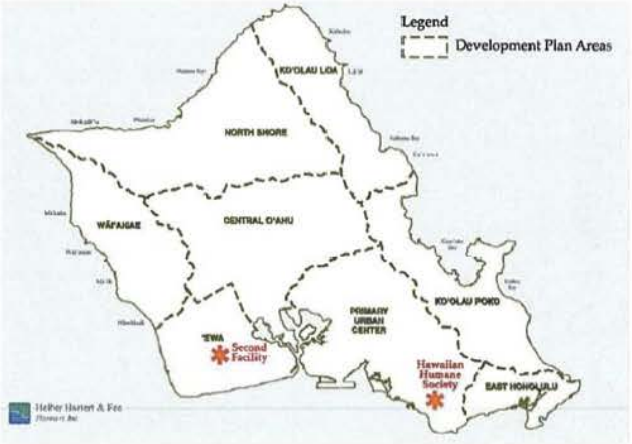
The Hawaiian Humane Society (HHS) has a long-established record of serving O'ahu's human and animal populations over its 100+ years existence. It has identified the need to undertake capital improvements at its existing Moi'li'ili facility in furtherance of its mission to promote the human-animal bond and the humane treatment of all living creatures. Limited space at the existing site, along with the recognition that future development on O'ahu will occur primarily in West and Central O'ahu, led your organization to target development of a second facility in the 'Ewa region. The purpose of our analysis was to quantify projected use at a second facility and implications of the new facility on the usage at the Moi'li'ili facility. Because the sheltering and care of canines and felines are the primary drivers of the physical design and programming of shelter facilities, the analysis was limited to projecting dog and cat admissions and adoptions at each facility.

II. METHODOLOGY

We used the following methodology to project the future number of animal admissions and adoptions at the existing and new facilities. The sources of the data are also identified below and are included in the enclosed CD-ROM, unless otherwise indicated. All the calculations are included in the Excel spreadsheet file <HHS Second Facility Analysis.xlsx>, except where noted. The relevant worksheet tabs from <HHS Second Facility Analysis.xlsx> are also identified below. All **Exhibits** are included at the end of this report. All Figures and Tables are embedded in this report.

Pacific Guardian Center, Makai Tower | 733 Bishop Street, Suite 2590 | Honolulu, Hawaii 96813
Telephone: 808.545.2055 | Facsimile: 808.545.2050 | www.hhf.com | e-mail: info@hhf.com

A. Determine Number of July 2009-June 2010 (FY 2010) Owner Surrenders (OS), Strays and Adoptions by City and County of Honolulu's Development Plan Areas (DP Area) (*See **Exhibit 1** Total Adoptions and Admissions by DP Area, FY 2010 and "Multiple Options FY10 Data" tab.*) See map below for DP Areas and location of Moi'li'ili facility and general location of proposed 'Ewa facility.



B. Calculate Per Capita Rates of OS, Strays and Adoptions by DP Area (*See **Exhibit 2** Population Projections and "Population Projections" tab.*)

i. Determine existing population by DP Area using 2010 Census data.
ii. Calculate individual per capita rates for OS dogs and cats, stray dogs and cats, and adopted dogs and cats for each DP Area. (*See **Exhibit 3** Per Capita Rate Calculations and "Per Capita Rates" tab.*)

C. Calculate Projected 2015 and 2030 Human Populations by DP Area

Note: Originally, the analysis was to be based on the City's September 2009 population projections, which represent the official City population projections for each DP Area. However, the September 2009 projections were based on Year 2000 Census data and subsequent State of Hawai'i population projections for Honolulu County. The September 2009 projections indicated an overall lower population projection for O'ahu for Year 2010 than was actually tallied in the

2010 Census. Because of this discrepancy and after consultation with the City and County of Honolulu's Department of Planning and Permitting (DPP) (personal communication with Mike Watkins of DPP's Policy Planning Branch, April 12, 2011), it was determined that population projections for this analysis should be calculated by applying growth rates calculated from the City's September 2009 projections to the actual 2010 Census counts.

i. Calculate population growth rates for each DP Area for 2015 and 2030. (*See **Exhibit 2** Population Projections and "Population Projections" tab.*)
ii. Apply growth rates for each DP Area to 2010 Census population. (*See **Exhibit 2** Population Projections "Population Projections" tab.*)

D. Calculate Total 2015 and 2030 Dog and Cat Admissions and Adoptions by DP Area (*See "2015 Admissions" and "2030 Admissions" tabs.*)

i. Multiply per capita admissions for each species by type (i.e., dog, cat, stray, OS) by the projected population for each DP Area.
ii. Multiply per capita adoptions for each species by the projected population for each DP Area.

E. Determine Moi'li'ili and 'Ewa Shares of Admissions and Adoptions by DP Area

i. Divide animal admissions and adoptions generated from each DP Area between the two facilities. The percentages assigned to each facility are based on population and employment projections, geographic distances to respective facilities, likely travel routes, future traffic conditions, and perceptions of the 'Ewa/Kapolei area in the near and long-term. The rationale for the share assignments is described in Section III Facility Share Assignments.

F. Calculate Projected Moi'li'ili and 'Ewa Admissions and Adoptions for 2015 and 2030

i. Multiply percentage share for each facility to total 2015 and 2030 admissions by DP Area. (*See "2015 Admissions," "2030 Admissions," and "2015 & 2030 Adoptions" tabs.*)

In addition to the quantitative calculations based on existing and future populations, we reviewed the August 2008 Ward Research Survey on "Public Attitudes Toward the Hawaiian Humane Society and Animal Related Issues" and the report "Redevelopment Options for the Hawaiian Humane Society Campus (Pacific Asia Design Group, Inc. and Animal Arts, January 22, 2010) to validate or otherwise inform the analysis assumptions and/or conclusions.

We reviewed draft findings and assumptions at a meeting held on April 14, 2011 with HHS senior staff, real estate consultants, and Campaign Commission chairperson. No changes to the assumptions presented at the time were recommended.

II. SOURCES

Information Item	Source/Notes
FY10 Strays, Owner Surrenders and Adoptions	Multiple Options, Inc. Excel file, sent via HHS on May 9, 2011. Filename: <*Adoptions.Admissions by Development Area 2009-2010 FY.xls*>.
Existing Population by DP Area	2010 Census, downloaded in April 2011 from <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. See tab "Population Projections" in Excel file <HHS Second Facility Analysis.xlsx> for summary.
Population Growth Rates	City and County of Honolulu, Department of Planning and Permitting, Socioeconomic Projections table dated September 2009. Downloaded in April 2011 from: <*http://honoluludpp.org/planning/demographics2/Projections/2000-2035byDPA.pdf*>. See 2009 DPP population projections table in <2000-2035byDPA (Sept 2009).pdf> and calculations in Excel file <HHS Second Facility Analysis.xlsx>, "Population Projections" tab.

III. FACILITY SHARE ASSIGNMENTS

The analysis assumed that both the Moi'li'ili and 'Ewa facilities would be equally appealing and accessible from a physical design and condition standpoint. That is, the Moi'li'ili facility would undergo renovation or redevelopment even if a new facility were constructed in the 'Ewa region.

Total projected admissions and adoptions for each DP Area were assigned to the Moi'li'ili and 'Ewa facilities according to the percentages shown in Table 1.

Table 1: 2015 and 2030 Facility Share Assignments

DP Area	2015 Moi'li'ili Share (%)	2015 'Ewa Share (%)	2030 Moi'li'ili Share (%)	2030 'Ewa Share (%)
PUC	85	15	**80**	**20**
'Ewa	5	95	5	95
Central O'ahu	15	85	**5**	**95**
East Honolulu	95	5	95	5
Ko'olau Poko	85	15	**80**	**20**
Ko'olau Loa	75	25	75	25
North Shore	5	95	5	95
Wāi'anae	5	95	5	95

bold = change from 2015

Percentage share assignments were determined based on the following assumptions:

- The Primary Urban Center (PUC), East Honolulu, Ko'olau Poko, and Ko'olau Loa DP Areas are assumed to primarily utilize services at the Moi'li'ili facility due to:
  - geographic proximity (PUC and East Honolulu)
  - likely travel routes (Pali Highway / H-1 interchange is closer to Moi'li'ili facility for Ko'olau Poko and Ko'olau Loa residents), and
  - habits and perceptions (current Ko'olau Poko residents are habituated to travel to Honolulu for work, recreation, entertainment, family, etc.).

- The 'Ewa, Central O'ahu, North Shore and Wāi'anae DP Areas are assumed to primarily use the 'Ewa facility due to geographic proximity. However, a small but significant portion of Central O'ahu residents (15%) were assumed to travel to the Moi'li'ili facility because of perceptions, habits, and locations of activities. I.e., many Central O'ahu residents may be former PUC residents, have close family members in the PUC, and whose children may attend school or other activities in the PUC. This is evidenced in high existing per capita rates of Central O'ahu adoptions and admissions.

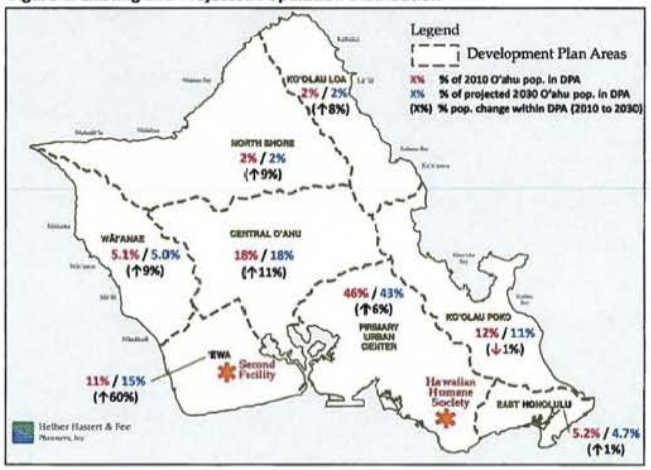
- The PUC encompasses the large, densely populated region extending from Kahala in the east to Pearl City in the west. Because Pearl City forms the western boundary of the PUC, having geographic proximity to 'Ewa, a small but significant percentage (15%) was assigned to the 'Ewa facility in the near term (2015).

- Although it would stand to reason that for some DP Areas, 100% of admissions and adoptions would occur at the closest facility (e.g., Wāi'anae DP Area→'Ewa facility

and East Honolulu DP Area→Moi'li'ili facility), in these cases, a nominal 5% share was assumed to use services at the geographically farther facility. This was done to account for the inevitable anomalies and exceptions to the assumed behaviors.

- In the long-term (2030), population is projected to grow by 60% and 11% in the 'Ewa and Central O'ahu DP Areas, respectively, while populations in the other six DP areas will increase by less than 10% (see Figure 1). Furthermore, employment in the 'Ewa DP Area is projected to increase by over 100% from 2010 conditions (from about 46,000 to 94,000 jobs) (see "Population Projections" tab). These changes in population and commercial activity will influence the perceptions and behavior of not only residents from surrounding DP Areas (e.g., Wāi'anae and Central O'ahu), but also more distant residents in the PUC and Ko'olau Poko. By 2030, residents in more far-flung areas of O'ahu may have many family members who reside in 'Ewa, may regularly patronize businesses there, or may even have employment there.

Figure 1: Existing and Projected Population Distribution



- According to analysis in the *O'ahu Regional Transportation Plan 2035 Public Review Draft* (O'ahu Metropolitan Planning Organization February 2011), the H-1 corridor will experience continued worsening of already congested conditions, and influence perceptions of travel from Windward O'ahu communities to 'Ewa and Moi'li'ili. Whereas in the near term 'Ewa might be perceived as "too far" to Ko'olau Poko residents, increased congestion and travel times in the H-1 corridor may outweigh these perceptions by 2030.

IV. ANALYSIS AND FINDINGS

A. Admissions

2010 Admissions. Total FY 2010 dog and cat admissions were recorded at 26,084 animals, consisting of almost 9,000 dogs and over 17,000 cats. Their distribution among the DP Areas summarized in Table 2. Figure 2 shows the DP Area boundaries and the FY 2010 distribution of admissions (percent share and actual number of admissions). Figure 3 summarizes the per capita rates of admissions for each DP Area. As seen in Table 2, the Primary Urban Center (PUC) generated the largest number of admissions by far of the eight DP Areas. However, as seen in Figure 3, Wāi'anae generates the highest per capita rates of dog and cat admissions.

Figure 2: Distribution of FY 2010 Moi'li'ili Admissions

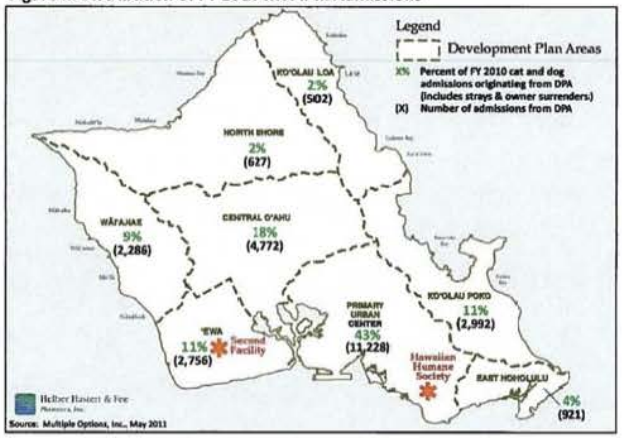
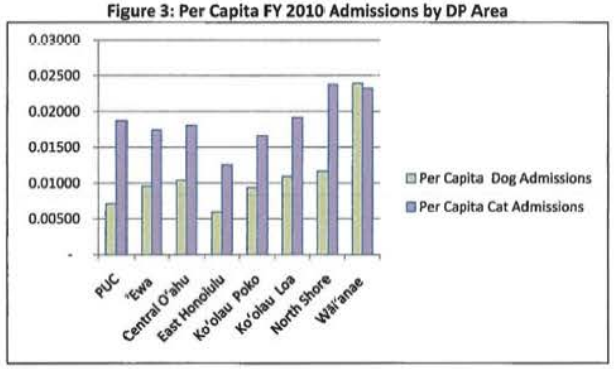


Table 2: FY 2010 Total Admissions

DP Area	Dogs	Cats	Total Dogs & Cats	% of Total
PUC	3,091	8,137	11,228	43%
'Ewa	976	1,780	2,756	11%
Central O'ahu	1,739	3,033	4,772	18%
East Honolulu	295	626	921	4%
Ko'olau Poko	1,077	1,915	2,992	11%
Ko'olau Loa	182	320	502	2%
North Shore	206	421	627	2%
Wāi'anae	1,160	1,126	2,286	9%
TOTAL	**8,726**	**17,358**	**26,084**	**100%**

Figure 3: Per Capita FY 2010 Admissions by DP Area



See "Per Capita Rates" tab for detailed breakdown.

Detailed breakdowns of admissions by species, type of admission (i.e., stray or OS), per capita rates of admissions, and DP Area are found in Exhibit 3. The data in **Exhibit 3** are included in the Excel file <HHS Second Facility Analysis>, "Multiple Options FY10 Data" tab on the accompanying CD-ROM.

2015 Admissions. Based on O'ahu's population increasing from 953,000 in 2010 to over 984,000 in 2015, total 2015 admissions are projected at 26,945 animals. Of this total, 14,652 or 54% are projected at the Moi'li'ili facility and 12,293 or 46% at the new 'Ewa facility. **Exhibit 4** includes detailed projections of 2015 admissions by species and type of admission by DP Area.

2030 Admissions. Based on O'ahu's population increasing to almost 1.07 million by 2030, total 2030 admissions are projected at 29,234 animals. Of this total, 13,815 or 47% are projected at the Moi'li'ili facility and 15,420 or 53% at the new 'Ewa facility. **Exhibit 5** includes detailed projections of 2030 admissions by species and type of admission by DP Area.

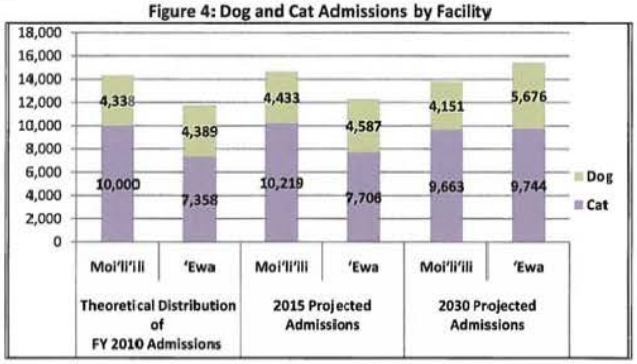
Table 3 summarizes existing and future projected admissions by facility. The table also includes a theoretical distribution of FY 2010 admissions between the existing Moi'li'ili facility and a theoretical 'Ewa facility (if an 'Ewa facility existed in 2010). For FY 2010, admissions from each DP Area to the Moi'li'ili and theoretical 'Ewa facility were based on the same percentage assignments as in the 2015 scenario (see **Exhibit 6** for calculations of theoretical distribution of FY 2010 admissions).

Table 3: Admissions Summary

	Theoretical Distribution of FY 2010 Admissions		2015 Projected Admissions		2030 Projected Admissions	
	Moi'li'ili	'Ewa	Moi'li'ili	'Ewa	Moi'li'ili	'Ewa
Dog	4,338	4,389	4,433	4,587	4,151	5,676
Cat	10,000	7,358	10,219	7,706	9,663	9,744
Total by Location	**14,338**	**11,746**	**14,652**	**12,293**	**13,815**	**15,420**
% Breakdown	55%	45%	54%	46%	47%	53%
Total (both sites)	**26,084**		**26,945**		**29,234**	

Figure 4 summarizes the distribution of dog and cat admissions by facility for each study year.

Figure 4: Dog and Cat Admissions by Facility



B. Adoptions

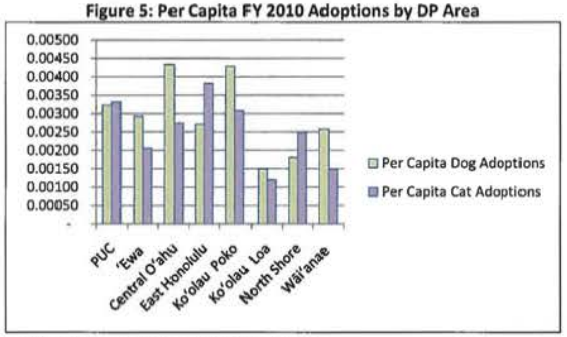
2010 Adoptions. Total FY 2010 dog and cat adoptions were recorded at 6,035 animals, with the distribution among the DP Areas summarized in Table 4. The PUC and Central O'ahu had the highest total number of adoptions, with the numbers of cat and dog adoptions in the PUC almost equal. Central O'ahu residents adopted almost 60% more dogs than cats from the HHS.

Table 4: FY 2010 Adoptions by DP Area

DP Area	Dog Adoptions	Cat Adoptions	Total
PUC	1,406	1,442	2,848
'Ewa	299	210	509
Central O'ahu	727	461	1,188
East Honolulu	135	190	325
Ko'olau Poko	493	354	847
Ko'olau Loa	25	20	45
North Shore	32	44	76
Wāi'anae	125	72	197
TOTAL	**3,242**	**2,793**	**6,035**

Figure 5 shows the relative per capita adoptions by species and DP Area. As seen in the chart, Central O'ahu and Ko'olau Poko had the highest per capita dog adoption rates, while East Honolulu had the highest per capita cat adoption rate.

Figure 5: Per Capita FY 2010 Adoptions by DP Area



See "Per Capita Rates" tab for detailed breakdown.

2015 Adoptions. Based on O'ahu's projected population increase between 2010 and 2015, total 2015 adoptions are projected at 6,218 animals. Of this total, 3,781 or 61% are projected at the Moi'li'ili facility and 2,737 or 39% at the new 'Ewa facility.

2030 Admissions. Based on 2030 population projections, total 2030 adoptions are projected at 6,667 animals. Of this total, 3,553 or 53% are projected at the Moi'li'ili facility and 3,114 or 47% at the new 'Ewa facility. **Exhibit 7** includes detailed calculations of 2015 and 2030 dog and cat adoptions by DP Area.

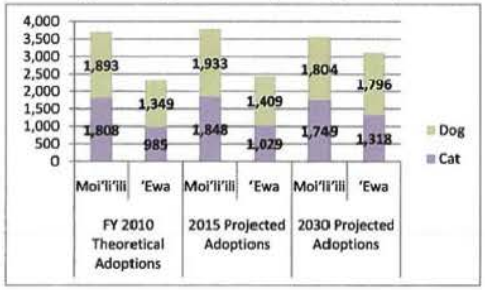
Table 5 summarizes existing and future projected adoptions by facility. The table also includes a theoretical distribution of 2010 adoptions between the existing Moi'li'ili facility and a theoretical 'Ewa facility (if an 'Ewa facility existed in 2010). For 2010, adoptions from each DP Area to the Moi'li'ili and theoretical 'Ewa facility were based on the same percentage assignments as in the 2015 scenario (see **Exhibit 8** for calculations of theoretical distribution of FY 2010 adoptions).

Table 5: Adoptions Summary

	FY 2010 Theoretical Adoptions		2015 Projected Adoptions		2030 Projected Adoptions	
	Moi'li'ili	'Ewa	Moi'li'ili	'Ewa	Moi'li'ili	'Ewa
Dog	1,893	1,349	1,933	1,409	1,804	1,796
Cat	1,808	985	1,848	1,029	1,749	1,318
Total by Location	3,701	2,334	3,781	2,437	3,553	3,114
% Breakdown	61%	39%	61%	39%	53%	47%
Total (both sites)	**6,035**		**6,218**		**6,667**	

Figure 6 summarizes the dog and cat adoptions by facility and year.

Figure 6: Dog and Cat Adoptions by Facility



V. CONCLUSION

It is clear from the data that demand exists for a second facility in the 'Ewa region currently (based on theoretical assignments), and that this demand will grow in the future (based on population projections). The data also indicate that in spite of their geographic distances from Moi'li'ili, outlying DP Areas such as Wāi'anae and North Shore generate higher per capita admissions than closer communities such as the PUC and East Honolulu. Furthermore, per capita dog adoptions are highest in Central O'ahu, an area that is more likely to frequent a facility in 'Ewa. This suggests that there may even be pent-up demand that is not accounted for by population-based analysis, as a more conveniently-located facility could attract additional new users.

Even with the introduction of a new facility, the data also support the continued need for a quality animal sheltering facility at the existing site. This is because, although the overall volume of animals served at the Moi'li'ili facility is anticipated to decrease with the construction of a second facility, it will still serve nearly 50% of the total number of animals sheltered by HHS.

It has been our pleasure to assist the Hawaiian Humane Society with this analysis in support of this important project. Please contact again us if we can assist you further in your mission.

Sincerely,

HELBER HASTERT & FEE, PLANNERS

Gail U. Renard, LEED AP
Senior Associate

Enclosures (listed on following page)

ENCLOSURES

Exhibits *(Note: All exhibits are included in the accompanying CD-ROM)*

Exhibit	Title
1	Total Adoptions and Admissions by DP Area, FY 2010
2	Population Projections
3	Per Capita Rate Calculations
4	2015 Projected Admissions
5	2030 Projected Admissions
6	Theoretical Distribution of FY 2010 Admissions
7	Projected 2015 and 2030 Adoptions
8	Theoretical Distribution of FY 2010 Adoptions

CD-ROM Contents

- Excel file <HHS Second Facility Analysis.xlsx> (contains all worksheets and calculations used in this analysis)
- Excel file <Adoptions.Admissions by Development Area 2009-2010 FY.xls> (original adoption and admissions data from Multiple Options, Inc.)
- PDF file < 000-2035byDPA (Sept 2009).pdf> (Honolulu Department of Planning and Permitting 2009 Population and Employment projections table)
- PDF file <HHS 2nd Facility Analysis Letter Report_May_2011> (electronic copy of this letter report)

EXHIBIT 1:
Total Adoptions and Admissions
by Development Plan Area (DP Area)
Fiscal Year 2009-2010

ADOPTIONS

DP Area	Dog Adoptions
Primary Urban Center	1,406
'Ewa	299
Central O'ahu	727
East Honolulu	135
Ko'olau Poko	493
Ko'olau Loa	25
North Shore	32
Wāi'anae	125
Dog Adoptions	**3,242**

DP Area	Cat Adoptions
Primary Urban	1,442
'Ewa	210
Central O'ahu	461
East Honolulu	190
Ko'olau Poko	354
Ko'olau Loa	20
North Shore	44
Wāi'anae	72
Cat Adoptions	**2,793**
DOG & CAT ADOPTIONS	**6,035**

ADMISSIONS (STRAYS)

DP Area	Total Stray Dogs	Counter	Field
Primary Urban Center	1,848	1,299	549
'Ewa	584	264	320
Central O'ahu	1,030	658	372
East Honolulu	167	130	37
Ko'olau Poko	623	300	323
Ko'olau Loa	126	42	84
North Shore	142	32	110
Wāi'anae	840	253	587
Stray Dogs	**5,360**	**2,978**	**2,382**

DP Area	Total Stray Cats	Counter	Field
Primary Urban	7,257	5,556	1,701
'Ewa	1,611	731	880
Central O'ahu	2,690	1,474	1,216
East Honolulu	556	498	58
Ko'olau Poko	1,693	1,207	486
Ko'olau Loa	394	76	318
North Shore	369	172	197
Wāi'anae	1,053	312	741
Stray Cats	**15,523**	**10,026**	**5,497**
STRAY DOGS & CATS	**20,883**		

ADMISSIONS (SURRENDERS)

DP Area	Dog Surrenders	Counter	Field
Primary Urban Center	1,243	1,243	0
'Ewa	392	391	1
Central O'ahu	709	706	3
East Honolulu	128	128	0
Ko'olau Poko	454	454	0
Ko'olau Loa	56	56	0
North Shore	64	63	1
Wāi'anae	320	319	1
Dog Surrenders	**3,366**	**3,360**	**6**

DP Area	Cat Surrenders	Counter	Field
Primary Urban	880	879	1
'Ewa	169	169	0
Central O'ahu	343	338	5
East Honolulu	70	70	0
Ko'olau Poko	222	222	0
Ko'olau Loa	26	26	0
North Shore	52	52	0
Wāi'anae	73	72	1
Cat Surrenders	**1,835**	**1,828**	**7**
DOG & CAT SURRENDERS	**5,201**		

TOTAL ADMISSIONS

DP Area	Total Dog Admissions
Primary Urban Center	3,091
'Ewa	976
Central O'ahu	1,739
East Honolulu	295
Ko'olau Poko	1,077
Ko'olau Loa	182
North Shore	206
Wāi'anae	1,160
Total	**8,726**

DP Area	Total Cat Admissions
Primary Urban	8,137
'Ewa	1,780
Central O'ahu	3,033
East Honolulu	626
Ko'olau Poko	1,915
Ko'olau Loa	320
North Shore	421
Wāi'anae	1,126
Total	**17,358**
TOTAL DOG & CAT ADMISSIONS	**26,084**

TOTAL DOG & CAT ADMISSIONS

DP Area	Total Dog & Cat Admissions	% of Total
PUC	11,228	43%
'Ewa	2,756	11%
Central O'ahu	4,772	18%
East Honolulu	921	4%
Ko'olau Poko	2,992	11%
Ko'olau Loa	502	2%
North Shore	627	2%
Wāi'anae	2,286	9%
Total	**26,084**	**100%**

Source: Multiple Options, Inc. Excel file <Adoptions.Admissions by Development Area 2009-2010 FY.xlsx. via HHS, 5/9/2011>

TOTAL ADOPTIONS

DP Area	Dog Adoptions	Cat Adoptions	Total
Primary Urban Center	1,406	1,442	**2,848**
'Ewa	299	210	**509**
Central O'ahu	727	461	**1,188**
East Honolulu	135	190	**325**
Ko'olau Poko	493	354	**847**
Ko'olau Loa	25	20	**45**
North Shore	32	44	**76**
Wāi'anae	125	72	**197**
Dog Adoptions	**3,242**	**2,793**	**6,035**

EXHIBIT 2:
Population Projections

DP Area	2010 Census*	2015 Adjusted Projection	2030 Adjusted Projection	2010 % of O'ahu Pop.	2030 % of O'ahu Pop.	Pop. Change (2010 to 2030)
PUC	435,048	444,156	460,330	45.6%	43.2%	5.81%
'Ewa	102,180	115,944	163,624	10.7%	15.3%	60.13%
Central Oahu	167,950	171,155	187,035	17.6%	17.5%	11.36%
East Honolulu	49,819	51,837	50,297	5.2%	4.7%	0.96%
Ko'olau Poko	115,164	116,598	114,190	12.1%	10.7%	-0.85%
Ko'olau Loa	16,697	17,211	18,089	1.8%	1.7%	8.34%
North Shore	17,720	18,321	19,371	1.9%	1.8%	9.32%
Wāi'anae	48,519	49,640	53,074	5.1%	5.0%	9.39%
SUM TOTALS	953,097	984,863	1,066,009	100%	100%	

* Source: 2010 Census <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml> accessed April 2011.

POPULATION DPP Projected 2015	2010 DPP Projection**	2015 DPP Projection**	Growth Rate (2015 Projection - 2010 Projection) / 2010 Projection	Growth Ratio (growth rate x 100)
PUC	418,664	427,429	0.02094	2.094%
'Ewa	94,504	107,234	0.13470	13.470%
Central Oahu	158,965	161,999	0.01909	1.909%
East Honolulu	49,129	51,119	0.04051	4.051%
Ko'olau Poko	114,209	115,631	0.01245	1.245%
Ko'olau Loa	14,156	14,592	0.03080	3.080%
North Shore	17,724	18,325	0.03391	3.391%
Wāi'anae	44,490	45,518	0.02311	2.311%
	911,841	941,847	0.03291	3.291%

POPULATION DPP Projected 2030	2010 DPP Projection**	2030 DPP Projection**	Growth Rate (2030 Projection - 2010 Projection) / 2010 Projection	Growth Ratio (growth rate x 100)
PUC	418,664	442,994	0.05811	5.811%
Ewa	94,504	151,332	0.60133	60.133%
Central Oahu	158,965	177,029	0.11364	11.364%
East Honolulu	49,129	49,600	0.00959	0.959%
Koolaupoko	114,209	113,243	(0.00846)	-0.846%
Koolauloa	14,156	15,336	0.08336	8.336%
North Shore	17,724	19,375	0.09315	9.315%
Waianae	44,490	48,667	0.09389	9.389%
	911,841	1,017,576	0.11596	11.596%

** City and County of Honolulu, Department of Planning and Permitting, Socioeconomic Projections table dated September 2009. Downloaded in April 2011 from: <http://honoluludpp.org/planning/demographics2/Projections/2000-2035byDPA.pdf>.

EXHIBIT 3:
Per Capita Rate Calculations

Per Capita Stray Dogs and Cats

DP Area	2010 Population	FY 2010 Stray Dog Total	Per Capita Stray Dogs	FY 2010 Stray Cat Total	Per Capita Stray Cats
PUC	435,048	1,848	0.00425	7,257	0.01668
'Ewa	102,180	584	0.00572	1,611	0.01577
Central O'ahu	167,950	1,030	0.00613	2,690	0.01602
East Honolulu	49,819	167	0.00335	556	0.01116
Ko'olau Poko	115,164	623	0.00541	1,693	0.01470
Ko'olau Loa	16,697	126	0.00755	294	0.01761
North Shore	17,720	142	0.00801	369	0.02082
Wāi'anae	48,519	840	0.01731	1,053	0.02170
TOTAL	953,097	5,360		15,523	

Sources: "Multiple Options Data" tab and "Population Projections" tab

Per Capita Owner Surrender Dogs and Cats

DP Area	2010 Population	FY 2010 OS Dog Total	Per Capita OS Dogs	FY 2010 OS Cat Total	Per Capita OS Cats
PUC	435,048	1,243	0.00286	880	0.00202
'Ewa	102,180	392	0.00384	169	0.00165
Central O'ahu	167,950	709	0.00422	343	0.00204
East Honolulu	49,819	128	0.00257	70	0.00141
Ko'olau Poko	115,164	454	0.00394	222	0.00193
Ko'olau Loa	16,697	56	0.00335	26	0.00156
North Shore	17,720	64	0.00361	52	0.00293
Wāi'anae	48,519	320	0.00660	73	0.00150
TOTAL	953,097	3,366		1,835	

Sources: "Multiple Options Data" tab and "Population Projections" tab

Per Capita Adoptions

DP Area	2010 Population	FY 2010 Dog Adoptions	Per Capita Dog Adoptions	FY 2010 Cat Adoptions	Per Capita Cat Adoptions
PUC	435,048	1,406	0.00323	1,442	0.00331
'Ewa	102,180	299	0.00293	210	0.00206
Central O'ahu	167,950	727	0.00433	461	0.00274
East Honolulu	49,819	135	0.00271	190	0.00381
Ko'olau Poko	115,164	493	0.00428	354	0.00307
Ko'olau Loa	16,697	25	0.00150	20	0.00120
North Shore	17,720	32	0.00181	44	0.00248
Wāi'anae	48,519	125	0.00258	72	0.00148
TOTAL	953,097	3,242		2,793	

Sources: "Multiple Options Data" tab and "Population Projections" tab

EXHIBIT 4:
2015 Projected Admissions

2015 Projected Dog Admissions (strays & owner surrenders)

DP Area	2015 Population Projections	Per Capita OS Dogs (1)	2015 OS Dogs	Per Capita Stray Dogs (1)	2015 Stray Dogs	2015 Total Dog Admissions
PUC	444,156	0.00286	1,269	0.00425	1,887	**3,156**
'Ewa	115,944	0.00384	445	0.00572	663	**1,107**
Central	171,155	0.00422	723	0.00613	1,050	**1,772**
East Honolulu	51,837	0.00257	133	0.00335	174	**307**
Ko'olau Poko	116,598	0.00394	460	0.00541	631	**1,090**
Ko'olau Loa	17,211	0.00335	58	0.00755	130	**188**
North Shore	18,321	0.00361	66	0.00801	147	**213**
Wāi'anae	49,640	0.00660	327	0.01731	859	**1,187**
TOTAL	984,863		**3,480**		**5,540**	**9,020**

Note: (1) From "Per Capita Rates" tab.

2015 Projected Cat Admissions (strays & owner surrenders)

DP Area	2015 Population Projections	Per Capita OS Cats (1)	2015 OS Cats	Per Capita Stray Cats (1)	2015 Stray Cats	2015 Total Cat Admissions
PUC	444,156	0.00202	898	0.01668	7,409	**8,307**
'Ewa	115,944	0.00165	192	0.01577	1,828	**2,020**
Central	171,155	0.00204	350	0.01602	2,741	**3,091**
East Honolulu	51,837	0.00141	73	0.01116	579	**651**
Ke'olau Poko	116,598	0.00193	225	0.01470	1,714	**1,939**
Ke'olau Loa	17,211	0.00156	27	0.01761	303	**330**
North Shore	18,321	0.00293	54	0.02082	382	**435**
Wāi'anae	49,640	0.00150	75	0.02170	1,077	**1,152**
TOTAL	984,863		**1,893**		**16,033**	**17,925**

Note: (1) From "Per Capita Rates" tab.

2015 Dog Admissions by Location

DP Area	2015 Dog Admissions	Mo'ili'ili Share	'Ewa Share	Projected 2015 Mo'ili'ili Dog Admissions	Projected 2015 'Ewa Dog Admissions	check column
PUC	3,156	0.85	0.15	2,682	473	3,156
'Ewa	1,107	0.05	0.95	55	1,052	1,107
Central O'ahu	1,772	0.15	0.85	266	1,506	1,772
East Honolulu	307	0.95	0.05	292	15	307
Ko'olau Poko	1,090	0.85	0.15	927	164	1,090
Ko'olau Loa	188	0.75	0.25	141	47	188
North Shore	213	0.05	0.95	11	202	213
Wāi'anae	1,187	0.05	0.95	59	1,127	1,187
TOTAL	**9,020**			**4,433**	**4,587**	9,020

2015 Cat Admissions by Location

DP Area	2015 Cat Admissions	Mo'ili'ili Share	'Ewa Share	Projected 2015 Mo'ili'ili Cat Admissions	Projected 2015 'Ewa Cat Admissions	check column
PUC	8,307	0.85	0.15	7,061	1,246	8,307
'Ewa	2,020	0.05	0.95	101	1,919	2,020
Central O'ahu	3,091	0.15	0.85	464	2,627	3,091
East Honolulu	651	0.95	0.05	619	33	651
Ke'olau Poko	1,939	0.85	0.15	1,648	291	1,939
Ke'olau Loa	330	0.75	0.25	247	82	330
North Shore	435	0.05	0.95	22	414	435
Wāi'anae	1,152	0.05	0.95	58	1,094	1,152
TOTAL	17,925			**10,219**	**7,706**	17,925

EXHIBIT 5:
2030 Projected Admissions

2030 Projected Dog Admissions (strays & owner surrenders)

DP Area	2030 Population Projections	Per Capita OS Dogs	2030 OS Dogs	Per Capita Stray Dogs	2030 Stray Dogs	2030 Total Dog Admissions
PUC	460,330	0.00286	1,315	0.00425	1,955	**3,271**
'Ewa	163,624	0.00384	628	0.00572	935	**1,563**
Central	187,035	0.00422	790	0.00613	1,147	**1,937**
East Honolulu	50,297	0.00257	129	0.00335	169	**298**
Ko'olau Poko	114,190	0.00394	450	0.00541	618	**1,068**
Ko'olau Loa	18,089	0.00335	61	0.00755	137	**197**
North Shore	19,371	0.00361	70	0.00801	155	**225**
Wāi'anae	53,074	0.00660	350	0.01731	919	**1,269**
TOTAL	1,066,009		**3,793**		**6,035**	**9,827**

2030 Projected Cat Admissions (strays & owner surrenders)

DP Area	2030 Population Projections	Per Capita OS Cats	2030 OS Cats	Per Capita Stray Cats	2030 Stray Cats	2030 Total Cat Admissions
PUC	460,330	0.00202	931	0.01668	7,679	**8,610**
'Ewa	163,624	0.00165	271	0.01577	2,580	**2,850**
Central	187,035	0.00204	382	0.01602	2,996	**3,378**
East Honolulu	50,297	0.00141	71	0.01116	561	**632**
Ko'olau Poko	114,190	0.00193	220	0.01470	1,679	**1,899**
Ko'olau Loa	18,089	0.00156	28	0.01761	319	**347**
North Shore	19,371	0.00293	57	0.02082	403	**460**
Wāi'anae	53,074	0.00150	80	0.02170	1,152	**1,232**
TOTAL	1,066,009		**2,039**		**17,368**	**19,407**

2030 Dog Admissions by Location

DP Area	2030 Dog Admissions	Moi'li'ili Share	'Ewa Share	Projected 2030 Moi'li'ili Dog Admissions	Projected 2000 'Ewa Dog Admisions	check column
PUC	3,271	**0.80**	**0.20**	2,617	654	3,271
'Ewa	1,563	0.05	0.95	78	1,485	1,563
Central O'ahu	1,937	**0.05**	**0.95**	97	1,840	1,937
East Honolulu	298	0.95	0.05	283	15	298
Ko'olau Poko	1,068	**0.80**	**0.20**	854	214	1,068
Ko'olau Loa	197	0.75	0.25	148	49	197
North Shore	225	0.05	0.95	11	214	225
Wāi'anae	1,269	0.05	0.95	63	1,205	1,269
TOTAL	**9,827**			**4,151**	**5,676**	9,827

2030 Cat Admissions by Location

DP Area	2030 Cat Admissions	Moi'li'ili Share	'Ewa Share	Projected 2030 Moi'li'ili Cat Admissions	Projected 2030 'Ewa Cat Admissions	check column
PUC	8,610	**0.80**	**0.20**	6,888	1,722	8,610
'Ewa	2,850	0.05	0.95	143	2,708	2,850
Central O'ahu	3,378	**0.05**	**0.95**	169	3,209	3,378
East Honolulu	632	0.95	0.05	600	32	632
Ko'olau Poko	1,899	**0.80**	**0.20**	1,519	380	1,899
Ko'olau Loa	347	0.75	0.25	260	87	347
North Shore	460	0.05	0.95	23	437	460
Wāi'anae	1,232	0.05	0.95	62	1,170	1,232
TOTAL	19,407			**9,663**	**9,744**	19,407

EXHIBIT 6:
Theoretical Distribution of FY 2010 Admissions

Theoretical Distribution of FY 2010 Dog Admissions

DP Area	FY10 Actual Dog Admissions	Moi'li'ili Share (1)	'Ewa Share (1)	Theoretical FY10 Moi'li'ili Dog Admissions	Theoretical FY10 'Ewa Dog Admissions	Total FY10 Dog Admissions
PUC	3,091	0.85	0.15	2,627	464	3,091
'Ewa	976	0.05	0.95	49	927	976
Central O'ahu	1,739	0.15	0.85	261	1,478	1,739
East Honolulu	295	0.95	0.05	280	15	295
Ko'olau Poko	1,077	0.85	0.15	915	162	1,077
Ko'olau Loa	182	0.75	0.25	137	46	182
North Shore	206	0.05	0.95	10	196	206
Wāi'anae	1,160	0.05	0.95	58	1,102	1,160
TOTAL	**8,726**			**4,338**	**4,389**	**8,726**

Note: (1) Uses 2015 Moi'li'ili-'Ewa share split

Theoretical Distribution of FY 2010 Cat Admissions

DP Area	FY10 Actual Cat Admissions	Moi'li'ili Share (1)	'Ewa Share (1)	Theoretical FY10 Moi'li'ili Cat Admissions	Theoretical FY10 'Ewa Cat Admissions	Total FY10 Cat Admissions
PUC	8,137	0.85	0.15	6,916	1,221	8,137
'Ewa	1,780	0.05	0.95	89	1,691	1,780
Central O'ahu	3,033	0.15	0.85	455	2,578	3,033
East Honolulu	626	0.95	0.05	595	31	626
Ko'olau Poko	1,915	0.85	0.15	1,628	287	1,915
Ko'olau Loa	320	0.75	0.25	240	80	320
North Shore	421	0.05	0.95	21	400	421
Wāi'anae	1,126	0.05	0.95	56	1,070	1,126
TOTAL	**17,358**			**10,000**	**7,358**	**17,358**

Note: (1) Uses 2015 Moi'li'ili-'Ewa share split

EXHIBIT 7:
Projected 2015 and 2030 Adoptions

Calculations of Projected 2015 and 2030 Adoptions (Dog & Cat)

Area	Per Capita Dog Adoptions (1)	Per Capita Cat Adoptions (1)	2015 Population	2015 Dog Adoptions	2015 Cat Adoptions	2015 Total Adoptions	2030 Population	2030 Dog Adoptions	2030 Cat Adoptions	2030 Total Adoptions
PUC	0.00323	0.00331	444,156	1,435	1,472	2,908	460,330	1,488	1,526	3,014
'Ewa	0.00293	0.00206	115,944	339	238	578	163,624	479	336	815
Central O'ahu	0.00433	0.00274	171,155	741	470	1,211	187,035	810	513	1,323
East Honolulu	0.00271	0.00381	51,837	140	198	338	50,297	136	192	328
Ko'olau Poko	0.00428	0.00307	116,598	499	358	858	114,190	489	351	840
Ko'olau Loa	0.00150	0.00120	17,211	26	21	46	18,089	27	22	49
North Shore	0.00181	0.00248	18,321	33	45	79	19,371	35	48	83
Wai'anae	0.00258	0.00148	49,640	128	74	202	53,074	137	79	215
TOTAL			**984,863**	**3,342**	**2,876**	**6,218**	**1,066,009**	**3,600**	**3,067**	**6,667**

Note: (1) From "Per Capita Rates" tab.

2015 Projected Dog Adoptions

DP Area	2015 Projected Dog Adoptions	Moi'li'ili Share	'Ewa Share	2015 Projected Moi'li'ili Dog Adoptions	2015 Projected 'Ewa Dog Adoptions	2015 Total Dog Adoptions
PUC	1,435	0.85	0.15	1,220	215	1,435
'Ewa	339	0.05	0.95	17	322	339
Central O'ahu	741	0.15	0.85	111	630	741
East Honolulu	140	0.95	0.05	133	7	140
Ko'olau Poko	499	0.85	0.15	424	75	499
Ko'olau Loa	26	0.75	0.25	19	6	26
North Shore	33	0.05	0.95	2	31	33
Wai'anae	128	0.05	0.95	6	121	128
TOTAL	**3,342**			**1,933**	**1,409**	**3,342**

2015 Projected Cat Adoptions

DP Area	2015 Projected Cat Adoptions	Moi'li'ili Share	'Ewa Share	2015 Projected Moi'li'ili Cat Adoptions	2015 Projected 'Ewa Cat Adoptions	2015 Total Cat Adoptions
PUC	1,472	0.85	0.15	1,251	221	1,472
'Ewa	238	0.05	0.95	12	226	238
Central O'ahu	470	0.15	0.85	70	399	470
East Honolulu	198	0.95	0.05	188	10	198
Ko'olau Poko	358	0.85	0.15	305	54	358
Ko'olau Loa	21	0.75	0.25	15	5	21
North Shore	45	0.05	0.95	2	43	45
Wai'anae	74	0.05	0.95	4	70	74
TOTAL	**2,876**			**1,848**	**1,029**	**2,876**

2030 Projected Dog Adoptions

DP Area	2030 Projected Dog Adoptions	Moi'li'ili Share (1)	'Ewa Share (1)	2030 Projected Moi'li'ili Dog Adoptions	2030 Projected 'Ewa Dog Adoptions	2030 Total Dog Adoptions
PUC	1,488	**0.80**	**0.20**	1,190	298	1,488
Ewa	479	0.05	0.95	24	455	479
Central O'ahu	810	**0.05**	**0.95**	40	769	810
East Honolulu	136	0.95	0.05	129	7	136
Ko'olau Poko	489	**0.80**	**0.20**	391	98	489
Ko'olau Loa	27	0.75	0.25	20	7	27
North Shore	35	0.05	0.95	2	33	35
Waianae	137	0.05	0.95	7	130	137
TOTAL	**3,600**			**1,804**	**1,796**	**3,600**

Note: (1) Bold numbers indicate change from 2015 share.

2030 Projected Cat Adoptions

DP Area	2030 Projected Cat Adoptions	Moi'li'ili Share (1)	'Ewa Share (1)	2030 Projected Moi'li'ili Cat Adoptions	2030 Projected 'Ewa Cat Adoptions	2030 Total Cat Adoptions
PUC	1,526	**0.80**	**0.20**	1,221	305	1,526
Ewa	336	0.05	0.95	17	319	336
Central O'ahu	513	**0.05**	**0.95**	26	488	513
East Honolulu	192	0.95	0.05	182	10	192
Ko'olau Poko	351	**0.80**	**0.20**	281	70	351
Ko'olau Loa	22	0.75	0.25	16	5	22
North Shore	48	0.05	0.95	2	46	48
Waianae	79	0.05	0.95	4	75	79
TOTAL	**3,067**			**1,749**	**1,318**	**3,067**

Note: (1) Bold numbers indicate change from 2015 share.

EXHIBIT 8:
Theoretical Distribution of FY 2010 Adoptions

Theoretical Distribution of FY 2010 Dog Adoptions

DP Area	FY10 Actual Dog Adoptions	Moi'li'ili Share (1)	'Ewa Share (1)	Theoretical FY10 Moi'li'ili Dog Adoptions	Theoretical FY09 'Ewa Dog Adoptions	Total FY09 Dog Adoptions
PUC	1,406	0.85	0.15	1,195	211	1,406
'Ewa	299	0.05	0.95	15	284	299
Central O'ahu	727	0.15	0.85	109	618	727
East Honolulu	135	0.95	0.05	128	7	135
Ko'olau Poko	493	0.85	0.15	419	74	493
Ko'olau Loa	25	0.75	0.25	19	6	25
North Shore	32	0.05	0.95	2	30	32
Wai'anae	125	0.05	0.95	6	119	125
TOTAL	3,242			**1,893**	**1,349**	**3,242**

Note: (1) Uses 2015 Moi'li'ili-'Ewa share split

Theoretical Distribution of FY 2010 Cat Adoptions

DP Area	FY10 Actual Cat Adoptions	Moi'li'ili Share (1)	'Ewa Share (1)	Theoretical FY10 Moi'li'ili Cat Adoptions	Theoretical FY09 'Ewa Cat Adoptions	Total FY10 Cat Adoptions
PUC	1,442	0.85	0.15	1,226	216	1,442
'Ewa	210	0.05	0.95	11	200	210
Central O'ahu	461	0.15	0.85	69	392	461
East Honolulu	190	0.95	0.05	181	10	190
Ko'olau Poko	354	0.85	0.15	301	53	354
Ko'olau Loa	20	0.75	0.25	15	5	20
North Shore	44	0.05	0.95	2	42	44
Wai'anae	72	0.05	0.95	4	68	72
TOTAL	2,793			**1,808**	**985**	**2,793**

Note: (1) Uses 2015 Moi'li'ili-'Ewa share split

	FY10 Theoretical Dog Adoption Split		FY10 Theoretical Cat Adoption Split	
	Moi'li'ili	'Ewa	Moi'li'ili	'Ewa
Totals	**3,242**		**2,793**	
By Location	**1,893**	**1,349**	**1,808**	**985**
% Share	**58%**	**42%**	**65%**	**35%**

Appendix B

Botanical Resources Assessment for the Hoʻopili Project, Honolulu, Oʻahu. Prepared for PBR Hawaiʻi & D.R. Horton – Schuler Division. Prepared by LeGrande Biological Surveys Inc. August 2006.

BOTANICAL RESOURCES ASSESSMENT FOR THE
HO`OPILI PROJECT
HONOULIULI, OAHU

MAIN PARCELS

Prepared by:

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68-310 Kikou Street
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Prepared for:

PBR HAWAII &
D.R. HORTON - SCHULER DIVISION

August 2006

INTRODUCTION

This report includes the findings of a botanical study conducted within the Honouliuli Region on the island of Oahu, Hawaii. LeGrande Biological Surveys Inc. carried out a botanical field survey of the above location on January18, 19, 23, 24, 30, and 31, and May 6 and 7, 2006, for a total of 8 field days. The primary objectives of the field studies were to:

1) provide a general description of the vegetation on the project site;
2) inventory the flora; and
3) search for threatened and endangered species as well as species of concern.

Federal and State of Hawaii listed species status follows U.S. Fish and Wildlife (USFWS) (1999a and 1999b, 2004) and Federal Register (2002).

GENERAL SITE DESCRIPTION

The area proposed for the Ho`opili Project in Ewa includes three main parcels (covered in this report) and two smaller "Off-Site" areas (separate reports). The main parcels covered in this report include: [A] a rectangular section to the west of Palehua Road, between H-1 Freeway and Farrington Highway (TMK 9-1-18:04);[B] a strip running east-west between H-1 Freeway (to the north) and Farrington Highway (to the south) (TMK 9-1-18:01); and [C] the largest parcel bordered by Farrington Highway to the north, Old Fort Weaver Road to the east, Mango Tree Road to the south, and Palehua Road and the new North-South Road to the west (TMK 9-1-17:04 (por.), 9-1-17:59, and 9-1-17:72). The entire area surveyed (and described in this report) encompasses approximately 1,555 acres

The majority of the surveyed area is either in active cultivation or cleared to bare dirt substrate. The edges of the agricultural fields along with a few small gulches harbor most of the plant diversity. Weedy plant species dominate all areas. The subject property ranges in elevation from near sea level to 250 ft. The Ho`opili parcels have been utilized for agriculture for some time, being planted in sugar cane in the past and now in diversified agriculture. Alteration of native plant habitat has been in place for some time and few of the natural plant elements remain.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. The 2004 Habitat Conservation Plan for *Abutilon menziesii* at Kapolei was reviewed for possible endangered plant locations within the survey area. Information from the Hawaii Biodiverstiy & Mapping Program database was reviewed. Topographic maps were examined to determine terrain characteristics, access, boundaries, and reference points.

A walk-through survey method was used. The boundaries of all five parcels were surveyed by foot. Roads through the subject property were driven and most were walked as well to survey for roadside plants. Transects on an average of 80 ft apart were surveyed on foot by 2 botanists for the parcel interiors, except in areas where active cultivation was in progress (i.e. cornfields were surveyed from the outer margins.). Special attention was paid to gulch areas and areas that contained scrub vegetation with native plant elements. Notes were made on plant associations and distribution, disturbances, topography, substrate types, exposure, drainage, etc. Plant identifications were made in the field. Plants that were not positively identified were collected for later determination, and for comparison with the recent taxonomic literature.

DESCRIPTION OF THE VEGETATION

The entire survey area is dominated by non-native plant species and agricultural crops. A total of 137 plant species were observed within the survey area. 133 are alien (introduced) and four are indigenous (native to the Hawaiian Islands and elsewhere). Therefore, 97% of the plant species observed were alien and only 3% native.

An inventory of all the plants observed within the five survey areas is presented in the species list at the end of the report.

TMK 9-1-18:04 [A]

This parcel is located between H-1 and Farrington Highway west of Palehua Road with Hunehune Gulch bordering the parcel to the west. The majority of the parcel is either cleared land or planted in corn. The edges of the parcel, including Palehua Road are dominated by weedy species such as, castor bean (*Ricinus* communis), lion's ear (*Leonotis nepetifolia*), partridge pea (*Chamaecrista nictitans*), and kikania (*Xanthium strumarium* var. *canadense*). A few kiawe (*Prosopis pallida*) and opiuma (*Pithecellobium dulce*) trees are scattered along the top of the gulch. Grass species throughout the parcel include natal redtop, sourgrass (*Digitaria insularis*), and swollen fingergrass (*Digitaria insularis*).

TMK 9-1-18:01 [B]

This parcel is a strip running east-west between H-1 Freeway (to the north) and Farrington Highway (to the south) with Fort Weaver Road bordering to the east. Aloun Farms baseyard is located within this section. The majority of this section consists of gently sloping agricultural fields planted with corn. Edges of fields and along roadsides were generally low-growing weedy shrubs dominated by koa haole, Christmas berry (*Schinus terebinthifolius*), sourbush (*Pluchea carolinensis*), castor bean, and guinea grass.

Honouliuli Gulch runs north-south through this section. The gulch is characterized by koa haole scrub at the northern (upper) sections. Along with koa haole and guinea grass as the dominant species several tall tree species reside in the gulch including kukui (*Aleurites moluccana*), kiawe, pride of India (*Melia azerdarach*), and autograph tree (*Clusia rosea*). Lower down the bottom of the gulch has been cleared for a banana (*Musa sp.*) patch that is currently in cultivation. At the lowest point of the gulch where it crosses Farrington Highway several morning-glory species were observed, koali ai (*Ipomoea cairica*), little bell (*I. Triloba*), and *I. obscura*. Primrose willow (*Ludwigia octovalvis*), love-in-a-mist (*Passiflora foetida*), and comb hyptis (*Hyptis pectinata*) were observed in the drainage.

The Aloun baseyard is planted with various cultivars including citrus (*Citrus sp.*), noni (*Morinda citrifolia*), kalo (*Colocasia esculenta*), yellow Poinciana (*Peltophorum pterocarpum*), sugarcane (*Saccharum officinarum*), and lemon grass (*Cymbopogon citratus*). The electric power substation has a hedge of tropical coral tree (*Erythrina variegata*) planted along the fenceline. Along Farrington Highway the vegetation is dominated by non-native grass species with kiawe, monkeypod (*Samanea saman*) trees and bougainvillea (*Bougainvillea sp.*) scattered along the length of the parcel.

TMK 9-1-17:04, 9-1-17:59, & 9-1-17:72 [C]

This is the largest section of the subject property, bordered by Farrington Highway to the north, Old Fort Weaver Road to the east, Mango Tree Road to the south, and Palehua Road and the new North-South Road to the west. The majority of this portion of the surveyed area is under cultivation or cleared to bare soil. Crops observed grown in this area include corn, melons (*Cucumis sp.*), basil (*Ocimum sp.*) and bananas. At the edges of planted areas and in fallow fields weedy species such as kili oopu (*cyperus rotundus*), wild spider flower (*Cleome gynandra*), and cheeseweed (*Malva parviflora*) were observed. There are several flumes running east-west through the property, they have a greater number of plant species due to the availability of water. The flumes are dominated by koa haole and guinea grass with other non-native plant species scattered within the site including, boerhavia (*Boerhavia coccinea*), Australian saltbush (*Atriplex semibaccata*), heliotrope (*Heliotropium procumbens*), coat buttons (*Tridax procumbens*), and slender mimosa (*Desmanthus pernambucans*). Along the flumes there are some larger woody species such as Christmas berry (*Schinus terebinthifolius*), fleabane (*Pluchea* x *fosbergii*), Chinese banyan (*Ficus microcarpa*), and a few mango (*Mangifera indica*) trees. The only indigenous plant species observed within the site are uncommon and include: ilima (*Sida fallax*) and scattered individuals of popolo (*Solanum americanum*) and uhaloa (*Waltheria indica*).

Between the fairly level agricultural fields and Old Fort Weaver Road, the property changes elevation quite drastically, there is a cliff approximately 20 to 30 feet high running the length of the eastern boundary. The majority of the cliff area is dominated by kiawe forest with an understory of guinea grass. Along the top of the cliff where the cultivated fields do not extend to the edge of the cliff, there are pockets of shrub vegetation that contain a few native plant species such as, ilima, uhaloa, and popolo. At the bottom of the cliff faces there are areas of flat land that extend to Old Fort Weaver Road. These areas are being utilized for various purposes including automobile parking, water pumping stations, baseyards, or farming. The area across from Kahi Mohala

appears to be used for storing and parking large buses and shuttles. Several large trees were observed in this area including earpod tree (*Enterolobium cyclocarpum*), kiawe, African tulip, monkey pod, and Chinese banyan (*Ficus microcarpa*).

The southern section of the parcel between Old Fort Weaver Road and the cliff contain flat areas where there is active farming and equipment buildings. The farm is growing basil, cucumber (*Cucumis sativus*), and horseradish tree (*Moringa oleifera*). Coconut trees (*Cocos nucifera*), papaya (*Carica papaya*), and bamboo (*Bambusa sp.*) are some of the plants observed growing around the farm buildings.

DISCUSSION AND RECOMMENDATIONS

None of the plants which occur on the project site is a threatened or endangered species or a species of concern (U.S. Fish and Wildlife Service, 1999a, 1999b, 2004; Wagner et. al., 1999). HBMP (Hawaii Biodiversity & Mapping Program) supplied historical and present locations of known Threatened and Endangered plant species within the project area for review. The only rare plant mapped near the project area was the kooloaula (*Abutilon menziesii*) population at the southern end of North-South Road. There were no threatened or endangered plants mapped within the Ho'opili project area itself. *A. menziesii* is protected by both the federal Endangered Species Act of 1973, as amended, and Chapter 195D, HRS, as amended. *A. menziesii* is a shrub of the mallow family, growing six to eight feet tall, with coarsely toothed, silvery, heart-shaped leaves that are about one to three inches long. Flowers are medium red to dark red and less than an inch in diameter. It has been sold as an ornamental plant at local nurseries in the past under the name "Red 'ilima." Other extant populations of Kooloaula currently exist on Lāna'i and Maui.

As part of the environmental planning for North-South Road and a portion of Kapolei Parkway, a "Habitat Conservation Plan for *Abutilon menziesii* at Kapolei" was finalized in March 2004. Mitigation measures have already been specified for these populations of *A. menziesii* related to construction of North-South Road. A concerted effort was made in surveying for *Abutilon menziesii* within the survey area. No plants of *A. menziesii* were observed during the survey.

No wetlands were encountered during either the January or May surveys. None of the three essential criteria for defining a federally recognized wetland were present within the study site. Those being hydrophytic vegetation, hydric soils, and wetland hydrology.

A follow up survey for wet season ephemeral plants was conducted in May following the heavy winter and spring rains. All parcels were resurveyed for additional plant species that may have been overlooked or died back during the January survey. No additional species were noted during this follow-up survey.

The proposed development of the surveyed area is not expected to have significant negative impacts on the botanical resources of the site or the general region.

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PLANTS SPECIES LIST – Ho`opili, Oahu, Hawaii
MAIN PARCELS

The following checklist is an inventory of all the plant species observed within the three parcels of the survey site for the proposed Ho`opili project. The plant names are arranged alphabetically by family and then by species into two groups: Monocots and Dicots. The taxonomy and nomenclature of the flowering plants (Monocots and Dicots) are in accordance with Wagner *et al.* (1990), Wagner and Herbst (1999) and Staples and Herbst (2005). Recent name changes are those recorded in the Hawaii Biological Survey series (Evehuis and Eldredge, eds, 1999-2002).

For each species, the following name is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:

   I= indigenous= native to the Hawaiian Islands and elsewhere.

   X=introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is Cook's arrival in the islands in 1778.

HO`OPILI PLANT SPECIES LIST
MAIN PARCELS
AUGUST 2006

SCIENTIFIC NAME	COMMON NAME	STATUS
MONOCOTS		
AGAVACEAE		
Cordyline fruticosa (L.) A.Chev.	Ti, ki	X
ALOEACEAE		
Aloe vera (L.) N.L.Burm.	Aloe	X
ARACEAE		
Colocasia esculenta(L.) Schott	Kalo, taro	X
Dracaena sp. L.	dracaena	X
ARECACEAE		
Areca catechu L.	Betel nut palm	X
Cocos nucifera L.	coconut	X
Phoenix dactylifera L.	Date palm	X
CYPERACEAE		
Cyperus involucratus Roxb.	Ahuawa haole	X
Cyperus rotundus L.	Kili oopu	X
MUSACEAE		
Musa sp. L.	banana	X
POACEAE		
Bambusa sp. Schreber	bamboo	X
Brachiaria mutica (Forssk.) Stapf	California grass	X
Cenchrus ciliaris L.	Buffelgrass	X
Cenchrus echinatus L.	Common sandbur	X
Chloris barbata (L.) Sw.	Swollen fingergrass	X
Coix lachryma-jobi L.	Job's tears, puoheohe	X
Cymbopogon citratus (DC) Stapf	Lemon grass	X
Cynodon dactylon (L.) Pers	manienie	X
Digitaria insularis (L.) Mez ex Ekman	sourgrass	X
Eleusine indica (L.) Gaertn.	wiregrass	X
Eragrostis tenella (L.) P.Beauv. Ex Roem.&Schult.		X
Melinus repens (Willd.) Zizka	Natal redtop	X
Panicum maximum L.	Guinea grass	X
Paspalum dilatatum Poir.	Dallis grass	X

Paspalum urvillei Steud.	Vasey grass	X
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**
Pennisetum purpureum Schumach.	Elephant grass	X
Saccharum officinarum L.	Sugar cane, ko	X
Setaria verticillata (L.) P.Beauv.	Bristly foxtail	X
Sorghum bicolor (L.) Moench	Sorghum	X
Sorghum halapense (L.) Pers.	Johnson grass	X
Zea mays L.	corn	X
DICOTS		
ACANTHACEAE		
Asystasia gangetica (L.) T. Anderson	Chinese violet	X
AIZOACEAE		
Trianthema portulacastrum L.		X
AMARANTHACEAE		
Achyranthes aspera L.		X
Alternanthera pungens Kunth	Khaki weed	X
Amaranthus spinosus L.	Spiny amaranth	X
Amaranthus viridis L.	Slender amaranth	X
ANACARDIACEAE		
Mangifera indica L.	mango	X
Schinus terebinthifolius Raddi	Christmas berry	X
ANNONACEAE		
Annona muricata L.	soursop	X
APOCYNACEAE		
Thevetia peruviana (Pers.) K.Schum.	Be-still tree	X
ARALIACEAE		
Schefflera actinophylla (Endl.) Harms	Octopus tree	X
ASCLEPIADACEAE		
Stapelia gigantea N.E.Br.	Zulu-giant	X
ASTERACEAE		
Bidens alba (L.) DC. var. *radiata* (Sch. Bip.) Ballard ex Melchert	Beggar tick	X
Bidens pilosa L.	Spanish needle	X
Conyza bonariensis (L.) Cronq.	Hairy horseweed	X
Crassocephalum crepidioides (Benth.) S.Moore	crassocephalum	X
Emilia fosbergii Nicolson	Red pualele	X

Lactuca serriola L.	Prickly lettuce	X
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**
Pluchea carolinensis (Jacq.) G. Don	sourbush	X
Pluchea indica (L.) Less.	Indian fleabane	X
Pluchea x *fosbergii* Coopper. & Galang	fleabane	X
Sonchus oleraceus L.	pualele	X
Tridax procumbens (L.)	Coat buttons	X
Verbesina encelioides (Cav.) Benth. & Hook	Golden crown-beard	X
Xanthium strumarium L. var. *canadense* (Miller)	kikania	X
BIGNONIACEAE		
Spathodea campanulata P. Beauv.	African tulip	X
BORAGINACEAE		
Heliotropium curassavicum L.	kipukai	1
Heliotropium procumbens Mill. var. *depressum* (Cham.) Fosberg		X
BUDDLEIACEAE		
Buddleia asiatica Lour.	Dog tail	X
CACTACEAE		
Opuntia ficus-indica (L.) Mill.	panini	X
CAPPARACEAE		
Cleome gynandra L.	Wild spider flower	X
CARICACEAE		
Carica papaya L.	papaya	X
CASUARINACEAE		
Casuarina equisetifolia L.	ironwood	X
CHENOPODIACEAE		
Atriplex semibaccata R.Br.	Australian saltbush	X
Chenopodium murale L.	aheahea	X
CLUSIACEAE		
Clusia rosea Jacq.	Autograph tree	X
CONVOLVULACEAE		
Ipomoea cairica (L.) Sweet	Ivy leaved morning glory, koali ai	X
Ipomoea obscura (L.) Ker Gawl.		X
Ipomoea triloba L.	Little bell	X

Merremia aegyptia (L.) Urb.	Hairy merremia	X
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**
CUCURBITACEAE		
Coccinea grandis (L.) Voigt	Ivy gourd	X
Cucumis dipsaceus ehrenb. Ex Spach	Hedgehog gourd	X
Cucumis melo L.	melon	X
Cucumis sativus L.	cucumber	X
Cucurbita sp. L.	Gourd, pumpkin	X
Momordica charantia L.	Balsam pear	X
EUPHORBIACEAE		
Aleurites moluccana (L.) Willd.	kukui	X
Chamaesyce hirta (L.) Millsp.	hairy spurge, garden spurge	X
Chamaesyce hypercifolia (L.) Millsp.	graceful spurge	X
Chamaesyce hyssopifolia (L.) Small		X
Euphorbia heterophylla L.	kaliko	X
Ricinus communis L.	Castor bean	X
FABACEAE		
Acacia farnesiana (L.) Willd.	Klu, aroma, kolu	X
Chamaecrista nictitans (L.) Moench	Partridge pea	X
Clitoria ternatea L.	Blue pea	X
Crotalaria incana L.	Fuzzy rattlepod	X
Crotalaria pallida Aiton	Smooth rattlepod	X
Desmanthus pernambucanus (L.) Thell.	Slender or virgate mimosa	X
Desmodium tortuosum (Sw.) DC	Florida beggarweed	X
Enterolobium cyclocarpum (N.Jacquin) Grisebach	Earpod	X
Erythrina variegata L.	Tropical coral tree	X
Indigofera hendecaphylla Jacq.	Creeping indigo	X
Indigofera suffritocosa Mill.	Iniko	X
Leucaena leucocephala (Lam.) de Wit	Koa haole	X
Macroptilium lathyroides (L.) Urb.	Wild bean	X
Peltophorum pterocarpum (A.P. de Candolle) K. Heyne	Yellow poinciana	X
Pithecellobium dulce (Roxb.) Benth.	opiuma	X
Prosopis pallida (Humb. & Bonpl. Ex Willd.) Kunth	Kiawe, algaroba	X
Samanea saman (Jacq.) Merr.	monkeypod	X
LAMIACEAE		
Hyptis pectinata (L.) Poit.	Comb hyptis	X
Leonotis nepetifolia (L.) R.Br.	Lion's ear	X

Ocimum basilicum L.	Sweet basil	X
SCIENTIFIC NAME	**COMMON NAME**	**STATUS**
Ocimum tenuifolium L.	Holy basil	X
MALVACEAE		
Abutilon grandifolium (Willd.) Sweet	Hairy abutilon	X
Abutilon incanum (Link.) Sweet	Hoary abutilon	X
Malva parviflora L.	Cheese weed	X
Malvastrum coromandelianum (L.) Garcke	False mallow	X
Sida ciliaris L.		X
Sida fallax Walp.	'ilima	I
Sida rhombifolia L.		X
Sida spinosa L.	Prickly sida	X
MELIACEAE		
Melia azerdarach L.	Pride of India	X
MORACEAE		
Ficus microcarpa L.f.	Chinese banyan	X
Morus sp. L.	Mulberry	X
MORINGACEAE		
Moringa oleifera Lamark	Horseradish tree	X
MYRTACEAE		
Eucalyptus degulpta Blume	Painted gum	X
Psidium guajva L.	Common guava	X
Syzigium cumini (L.) Skeels	Java plum	X
NYCTAGINACEAE		
Boerhavia coccinea Mill.		X
Bougainvillea sp. A.L. Jussieu	bougainvillea	X
ONAGRACEAE		
Ludwigia octovalvis (Jacq.) Raven	Primrose willow	X
PASSIFLORACEAE		
Passiflora foetida L.	Love-in-a-mist	X
POLYGONACEAE		
Antigonon leptopus Hook&Arnott	Mexican creeper	X
PORTULACACEAE		
Portulaca oleracea L.	pigweed	X

SCIENTIFIC NAME	COMMON NAME	STATUS
RUBIACEAE		
Morinda citrifolia L.	noni	X
RUTACEAE		
Citrus xparadisi MacFadyen	grapefruit	X
Citrus sp. L.	citrus	X
SOLANACEAE		
Datura stramonium L.	Jimson weed	X
Nicandra physalodes (L.) Gaertn.	Apple of Peru	X
Nicotiana glauca R.C. Graham	Tree tobacco	X
Solanum americanum Mill.	Glossy nightshade, popolo	I
Solanum lycopersicum L. var. *cerasiforme* (Dunal) Spooner, G.J. Anderson & R.K. Jansen	Cherry tomato	X
Solanum torvum Sw.		X
STERCULIACEAE		
Waltheria indica L.	`uhaloa	I
VERBENACEAE		
Stachytarpheta jamaicensis (L.) Vahl	Jamaican vervain	X
ZYGOPHYLLACEAE		
Tribulus terrestris L.	Puncture vine	X

Appendix C

A Survey of Avian and Mammalian Resources for the Ho'opili Development Project, 'Ewa District, O'ahu, Hawai'i. Prepared for PBR Hawai‘i. Prepared by Rana Productions, Ltd. February 2008.

A Survey of Avian and Mammalian Resources for the Ho'opili Development Project, 'Ewa District, O'ahu, Hawai'i.

-

Main Parcels

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Table of Contents

Table of Contents 2
Introduction 3
General Site Description 3
Mammalian Survey Methods 5
Mammalian Survey Results 5
Avian Survey Methods 5
Avian Survey Result 7
Discussion 9
Mammalian Resources 9
Avian Resources 9
Conclusions 10
Glossary 11
Literature Cited 12

Figures & Tables

Figure 1. Ho'opili Project Location Map 4
Figure 2. Cleared former sugar cane fields and ruderal vegetation along road 6
Figure 3. Corn fields typical of diversified crops to the south of Farrington Hwy.. 6

Table 1. Avian Species Detected Ho'opili Project Site - Main Sites 7

Introduction

D. R. Horton – Schuler Division is proposing to develop a residential community on approximately 1,555-acres of land in the 'Ewa District, O'ahu (Figure 1). This report summarizes the findings of the avian and mammalian surveys that were conducted on the subject property to determine the potential effects of the proposed development on biological resources present on the site and within the general project area.

A primary goal of the surveys was to determine if there were any avian or mammalian species currently listed as endangered, threatened, or proposed for listing under either Federal or State of Hawaii endangered species statutes. Listed species status follows species identified in the following referenced documents (Division of Land and Natural Resources (DLNR) 1998, Federal Register 2005, U. S. Fish & Wildlife Service (USFWS) 2005, 2006). Fieldwork was conducted on July 20, and 21, 2006.

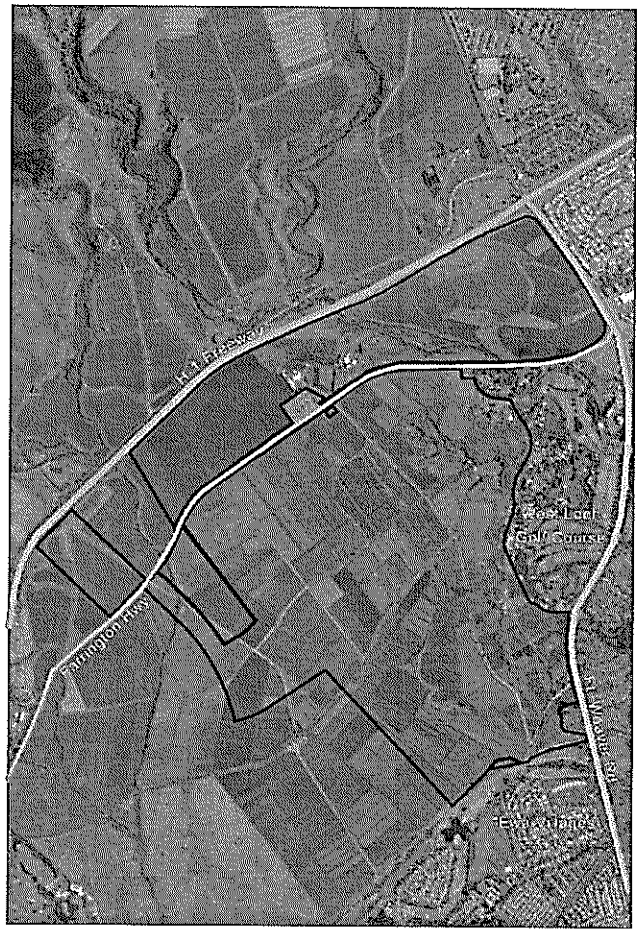
The avian phylogenetic order and nomenclature used in this report follows *The American Ornithologists' Union Checklist of North American Birds 7th Edition* (American Ornithologists' Union 1998), and the 42nd through the 47th supplements to *Check-list of North American Birds* (American Ornithologists' Union 2000; Banks et al. 2002, 2003, 2004, 2005, 2006). Mammal scientific names follow *Mammals in Hawaii* (Tomich 1986). Plant names follow *Manual of the Flowering Plants of Hawai'i* (Wagner et al. and Wagner and Herbst, 1990, 1999). Place names follow *Place Names of Hawaii* (Pukui et al. 1974).

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text on Page 11.

General Site Description

The proposed Ho'opili Development includes five main parcels which are identified as (TMK: 9-1-17:04 (por.), 9-1-17:59 and 9-1-17:72, 9-1-18:01 and 9-1-18:04, and two smaller "off-site" parcels, which are covered in two separate reports (David 2008a, 2008b). This reports covers the approximately 1555-acres, which make up the main development area (Figure 1).

The project site is made up primarily of former sugar cane fields, most fallow now, though some are being farmed for various diversified agricultural crops. The site is bound to the north by the H-1 Freeway, to the east by Fort Weaver Road and to the west by additional former sugar cane lands. Farrington Highway transects the side from east to west (Figure 1). The terrain slopes gently from the north-to-south, from an elevation of approximately 200-feet above mean sea level (MSL) at the north corner of the site, adjacent to Fort Weaver Road and H-1 Freeway off ramp, down to approximately 60-feet MSL at the southwestern corner of the site located along Mango Tree Road (Figure 1).



HO'OPILI
Oahu, Hawaii

Much of the site is made up of former sugar cane land, some of which is bare, (Figure 2), and some of which is under active cultivation of various diversified crops, such as corn, and bananas (Figure 3). Areas along roads and between fields are vegetated with a mix of predominantly alien ruderal species typical of disturbed former sugar fields on O'ahu (Figure 2). The vegetation present on the project site is almost completely dominated by alien species. The botanical surveys conducted on the site identified 137-plant species, four of which are considered indigenous, the remainder alien to the Hawaiian Islands (LeGrande 2006).

Mammalian Survey Methods

All observations of mammalian species were of an incidental nature. With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *'ōpe'ape'a* as it is known locally, all terrestrial mammals currently found on the Island of O'ahu are alien species, and most are ubiquitous. Two hours were spent within the project area on the evenings of August 30 and 31, 2006 and again in the early morning hours of August 31, and September 1, 2006, in an attempt to detect Hawaiian hoary bats. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal signs. A running tally was kept of all vertebrate species observed and heard within the study area.

Mammalian Survey Results

Five mammalian species were detected within the project site. Numerous European house mice (*Mus musculus domesticus*) were seen at several locations during the course of this survey. A total of five domestic dogs (*Canis f. familiaris*) were seen within, or adjacent to the study area. Nine small Indian mongooses (*Herpestes a. auropunctatus*) were seen at various locations within the site, as were three cats (*Felis catus*). Many more dogs and cats were seen and or heard within existing developments located to the northeast and southeast of the proposed project site. Additionally, tracks, scat and sign of dog, mongoose, cat, and horse (*Equus c. caballus*) were observed in numerous locations within the project site.

The endangered Hawaiian hoary bat was not recorded during the course of this survey. This finding is not surprising given that this species has rarely been documented from the Island of O'ahu (Tomich 1986, USFWS 1998).

Avian Survey Methods

Twenty-seven avian count stations were sited along linear transects within the subject property. Six-minute point counts were made at each of the 27-count stations. Field observations were made using Leitz 10 X 42 binoculars and by listening for avian vocalizations. Counts took place between 06:30 a.m. and 11:00 a.m., the peak of daily bird activity. An additional two hours was spent within the project area on the evenings of August 30 and 31, 2006 and again in the early morning hours of August 31, and September 1, 2006 in an attempt to detect crepuscular and/or nocturnally flying seabirds and owls. Time not spent conducting station counts was used to search the subject property for species and habitats not detected during count sessions.

Figure 2 – Cleared former sugar cane fields and ruderal vegetation along road

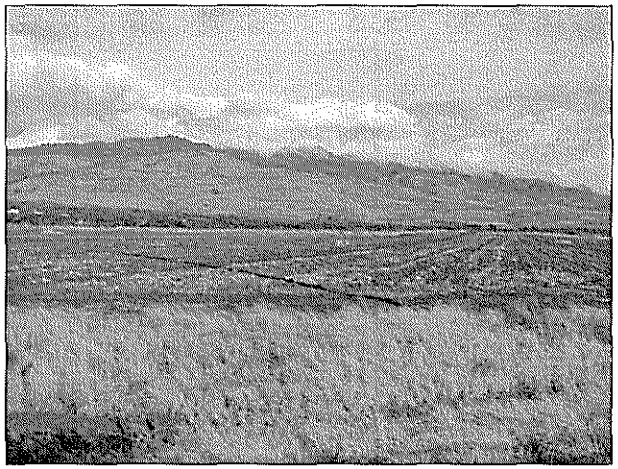


Figure 3 – Cornfields typical of diversified crops to the south of Farrington Hwy.

Avian Survey Results

A total of 831 individual birds, of 24 different avian species, representing 15 separate families were recorded during station counts. These results are summarized in Table 1. Two of the species recorded, Pacific Golden-Plover (*Pluvialis fulva*) and Ruddy Turnstone (*Arenaria interpres*), are indigenous migratory shorebird species. Both species breed in the high Arctic, and spend their winters in Hawai'i and the tropical Pacific. The remaining 22 species detected are considered to be alien to the Hawaiian Islands (Table 1).

Avian diversity and densities were relatively low, not surprising given the depauperate state of the habitat found on most of the site. Four species, Common Waxbill (*Estrilda astrild*), Red-vented Bulbul (*Pycnonotus cafer*), Common Myna (*Acridotheres tristis*), and Spotted Dove (*Streptopelia chinensis*) accounted for slightly less than 43% of the total number of individual birds recorded. Common Waxbills were the most frequently recorded species, accounting for more than 13% of the total number of individual birds recorded during station counts. We recorded an average of 23 birds per station count.

Table 1. Avian Species Detected Ho'opili Project – Main Sites

Common Name	*Scientific Name*	*ST*	*RA*
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Gray Francolin	*Francolinus pondicerianus*	A	0.15
Black Francolin	*Francolinus francolinus*	A	0.26
Erckel's Francolin	*Francolinus erckelii*	A	0.56
Ring-necked Pheasant	*Phasianus colchicus*	A	0.19
	CICONIIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Cattle Egret	*Bubulcus ibis*	A	0.74
	CHARADRIIFORMES		
	CHARADRIIDAE - Lapwings & Plovers		
	Charadriinae - Plovers		
Pacific Golden-Plover	*Pluvialis fulva*	IM	0.37
	SCOLOPACIDAE - Sandpipers, Phalaropes & Allies		
	Scolopacinae - Sandpipers & Allies		
Ruddy Turnstone	*Arenaria interpres*	IM	0.41

Common Name	*Scientific Name*	*ST*	*RA*
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	2.81
Zebra Dove	*Geopelia striata*	A	2.15
Mourning Dove	*Zenaida macroura*	A	0.15
	PASSERIFORMES		
	ALAUDIDAE - Larks		
Sky Lark	*Alauda arvensis*	A	1.63
	PYCNONOTIDAE - Bulbuls		
Red-vented Bulbul	*Pycnonotus cafer*	A	3.22
	ZOSTEROPIDAE - White-Eyes		
Japanese White-eye	*Zosterops japonicus*	A	2.41
	MIMIDAE - Mockingbirds & Thrushes		
Northern Mockingbird	*Mimus polyglottos*	A	2.89
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	2.89
	EMBERIZIDAE - Emberizids		
Red-crested Cardinal	*Paroaria coronata*	A	0.70
	CARDINALIDAE - Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	0.74
	FRINGILLIDAE - Fringilline And Carduelline Finches & Allies		
	Carduelinae - Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	1.85
	PASSERIDAE - Old World Sparrows		
House Sparrow	*Passer domesticus*		0.67
	ESTRILDIDAE - Estrildid Finches		
	Estrildinae - Estrildine Finches		
Common Waxbill	*Estrilda astrild*	A	4.11
Red Avadavat	*Amandava amandava*	A	0.78
Nutmeg Mannikin	*Lonchura punctulata*	A	1.41
Chestnut Munia	*Lonchura atricapilla*	A	0.48
Java Sparrow	*Padda oryzivora*	A	1.04

KEY TO TABLE 1

ST Status

A Alien – introduced to the Hawaiian Islands by humans

IM Indigenous Migrant – a native migratory species that winters in Hawai'i but breeds elsewhere

RA Relative Abundance – number of birds detected divided by the number of count stations (27)

Discussion

Mammalian Resources

The findings of the mammalian survey are consistent with the findings of at least one other recent survey conducted on lands immediately adjacent to the subject property (David 2005a), as well as with several others faunal surveys conducted in the general vicinity of the subject property in the recent past (David 2000, 2001, 2005b, 2008a, 2008b, David and Guinther 2000, 2005, 2006, 2007).

As previously mentioned we did encounter several European house mice within the project site. It is also likely that the other three established *muridae* in Hawaii, roof rats (*Rattus r. rattus*), Norway rats (*Rattus norvegicus*), and possibly Polynesian rats (*Rattus exulans hawaiiensis*), use resources present within the project site. These commensal species are all but ubiquitous on the island of O'ahu. All of these introduced rodents are deleterious to remaining native ecosystems and the native floral and faunal species that are dependant on them for their survival.

Avian Resources

The findings of the avian survey are consistent with the findings of at least one other recent avian survey conducted on lands immediately adjacent to the subject property (David 2005a), as well as with several others avian surveys conducted in the general vicinity of the subject property in the recent past (David 2000, 2001, 2005b, 2008a, 2008b, David and Guinther 2000, 2005, 2006, 2007).

Only two of the 24-avian species recorded during the course of this survey are native species. The two species in question, Pacific Golden-Plover, and Ruddy Turnstone are indigenous migratory shorebird species that breed in the high Arctic and spend the winter months in Hawai'i and the tropical Pacific. Both species are readily seen throughout the Hawaiian Islands between late July and the end of April each year. The remaining 22-species detected are considered to be alien to the Hawaiian Islands (Table 1).

Although not detected during this survey, it is likely that the Hawaiian endemic sub-species of the Short-eared Owl *Asio flammeus sandichensis*), or *pueo* use resources within the general project area. This species is regularly seen along the Wai'anae coast from the Lualualei Naval Reservation to Waimānalo Gulch (David 2005c). The O'ahu population of the short-eared Owl is listed as an endangered species under the State of Hawai'i's endangered species program, though; it is not protected under the federal endangered species statutes (DLNR 1998).

From an avian and native mammalian perspective there is nothing unique about the subject property, and none of the study area is important habitat for any listed avian or mammalian species currently known from the Island of O'ahu.

Conclusions

It is not expected that the modification of the project area or the development of the site will have a negative impact on any avian or mammalian species currently listed as endangered, threatened, or any that are currently proposed for listing under either Federal or State of Hawai'i endangered species statutes.

Glossary

Alien - Introduced to Hawai'i by humans
Commensal - Animals that share human food such as rats and mice
Crepuscular – Twilight hours
Depauperate – Lacking in numbers or variety of species
Endangered – Listed and protected under the ESA as an endangered species
Endemic – Native and unique to the Hawaiian Islands
Indigenous - Native to the Hawaiian Islands, but also found elsewhere naturally
Muridae - Rodents, including rats, mice and voles, one of the most diverse families of mammals.
Nocturnal – Night-time, after dark
'ōpe'ape'a – Hawaiian hoary bat (*Lasiurus cinereus semotus*)
pueo – Hawaiian endemic cub-species of the Short-eared Owl (*Asio flammeus sandwichensis*)
Ruderal – Disturbed, rocky, rubbishy areas, such as old agricultural fields and rock piles
Threatened - Listed and protected under the ESA as a threatened species

DLNR – Hawaii State Department of Land & Natural resources
TMK – Tax Map Key
USFWS – U.S. Fish & Wildlife Service

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Appendix D

Arthropod Survey and Assessment Ho'opili Project, 'Ewa District, O'ahu, Hawai'i. Prepared for PBR Hawai‘i & D. R. Horton – Schuler Division. Prepared by Pacific Analytics, L.L.C. May 2008.

ARTHROPOD SURVEY AND ASSESSMENT

HO'OPILI PROJECT

'EWA DISTRICT, O'AHU, HAWAI'I

May 2008

Prepared for

PBR HAWAI'I &
D.R. HORTON - SCHULER DIVISION
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INTRODUCTION

A survey of arthropods on the Ho'opili Project Site was conducted on May 09, 2008 by Dr. Gregory Brenner of Pacific Analytics, LLC. The primary objectives of the survey were to provide a general description of the arthropod fauna of the Ho'opili Project Site, evaluate the habitats, and search and assess the potential for threatened and endangered arthropod species as well as species of concern (DLNR 1997, Federal Register 1999, 2005).

GENERAL SITE DESCRIPTION

The approximately 1,550 acre (627 hectares) Ho'opili Project Site in the 'Ewa District on the Island of O'ahu includes three main parcels, Parcels A, B, and C, and seven smaller parcels, Parcels D1, D2, E1, E2, E3, F, and G (see Figure 1.5, DEIS page 4). The Ho'opili Project Site ranges in elevation from near sea level to about 430 ft (131 m). The Ho'opili Project Site was cultivated in sugarcane from the late 1800s to 1995, and currently contains cultivated fields for diversified agriculture, pasturage, and agricultural research, and some small gulches and cliffs. The edges of the fields and the small gulches and cliffs on the site are weedy areas dominated by alien plant species (LeGrande 2006).

There are neither unique floral habitats nor unique avian and mammalian faunal habitats on the Ho'opili Project Site and a survey for botanical, avian, and mammalian resources found no threatened endangered, or species endemic to Hawai'i at the site (LeGrande 2006, David 2008).

SURVEY METHODS

Prior to the site visit a search of literature pertaining to arthropods found in the 'Ewa District was conducted. Maps and aerial photographs of the Ho'opili Project Site were examined to familiarize the principal investigator with the general area and locate potential arthropod habitats. After examining the maps and aerial photographs it was determined that special attention should be given to the gulch and the cliff areas where the botanical survey identified scrub vegetation with native plant elements (LeGrande 2006). These areas were determined to have the best potential as native arthropod habitats.

The areas selected as requiring special attention include Honouliuli Gulch running through Parcel B, two flumes that run east-west through Parcel C, and the cliffs along the eastern boundary of Parcel C.

The arthropod survey was conducted on May 9, 2008. Roads were driven on the Ho'opili Project Site to locate potential arthropod habitats previously identified from maps and aerial photographs. A Staged Random-Walk survey method was used in these areas. Vegetation was sampled on foot along roads and between cultivated fields where arthropods would likely be found using the following methods.

Aerial Netting - Flying insects were captured in aerial nets and placed into vials for immediate identification in the field. Species present were recorded in a field notebook with annotations about relative abundance and other ecological information. Specimens were released after identification.

Sweep Netting - Grasses, small shrubs and other low-lying vegetation was sampled with a sweep net. An insect net was brushed along the top of the vegetation or grass to capture insects. Specimens were released after identification.

Foliage Beating -Foliage was sampled using a beating sheet. An insect net was placed under a branch and the stem was struck with a short stick. Arthropods on the foliage were dislodged and fell onto the sheet where they were collected with an aspirator into vials for identification. Specimens were released after identification.

Visual Inspection – Plants were visually inspected for arthropods that were not collected by other methods. Time was also spent observing larger flying insects that could be identified on the wing. The Honouliuli Gulch was also visually inspected for aquatic insects after water began flowing, apparently released from the state flood control detention pond upstream of the site.

Sampling Transects – The length of sampling transects varied with location. Staged Random-Walk sampling transects were used to survey each area. Sampling transects were selected at random to represent at least twenty percent of the vegetation on each Parcel. Sampling intensity was increased to at least fifty percent in those areas identified from maps and aerial photographs as requiring special attention.

DESCRIPTION OF THE ARTHROPOD FAUNA

Twenty-seven species of insects representing eight orders and at eighteen families were observed at the site. In additional three species of spiders were also recognized.

The entire site is disturbed by agriculture and related activities, and the vegetation is composed of non-indigenous, weedy species. This is reflective of the overall arthropod community which is almost entirely non-indigenous. Only one indigenous species, *Pantala flavescens*, a common dragonfly, was observed. No endemic native Hawaiian arthropods were detected.

Plants that were in bloom attracted pollen and nectar feeders, especially bees and butterflies. Other insects were found feeding on plant juices, under leaves and on stems. Ants were the most abundant insect on the ground.

There have been no previous arthropod surveys at the Ho'opili Project Site and a search of literature revealed only one reference of an arthropod study in the Barbers Point vicinity. The nearest and most complete comparative survey was one conducted in 2006 by the principal investigator for the proposed development of the Kapolei Harborside Center (Pacific Analytics 2006). In that study one hundred and ninety-five species of insects representing sixteen orders and at least seventy-five families were collected with an additional nineteen species of spiders, three species of other arthropods, and five species of fossilized snail.

More than ninety percent of the species collected in the Kapolei Harborside Center Project Site survey were non-indigenous. Many are cosmopolitan, weedy species found throughout the Pacific and the World. The few indigenous and endemic species observed at the Project Site are common and no rare, endangered, threatened, or species of concern were detected. The large proportion of non-indigenous species was an indication of the amount of habitat degradation that resulted from the various agricultural and mining operations that have occurred at the site.

Similar degradation has occurred at the Ho'opili Project Site as a result of the more than one hundred years of agricultural use. The vegetation at the Ho'opili Project Site is similar to but less diverse than that at Kapolei Harborside Center Project Site. In my judgment, the arthropod fauna at the Ho'opili Project Site is not substantially different from that found at the Kapolei Harborside Center Project Site and it is unlikely that an intensive inventory of the site would yield significantly different findings from the 2006 study.

Despite particular attention to gulches, flumes, and water detention areas, no native Hawaiian damselflies of other endemic aquatic arthropod species were detected. Given the intermittent nature of the water flow in these some of these areas it is unlikely that aquatic species would persist there. Only one species of native Hawaiian damselfly is historically known from this area, *Megalagrion xanthomeles*, and that species is nearly extirpated from Oahu, known recently from only one locality above Honolulu (BPBM 2008).

SUMMARY OF THE ARTHROPOD FAUNA

The arthropods species that were collected during this study would be considered typical of what would be found in lowland sites with little or no native vegetation and disturbed by agricultural operations. No species were found that are locally unique to the site. Nor were any species found whose habitat would be threatened by the proposed development at the site.

The results of this arthropod survey at the Ho'opili Project Site indicate there are no special concerns or legal constraints related to invertebrate resources in the project area. Although several species of Hawaiian endemic arthropods may occur on the 'Ewa plain, these species are not likely to be abundant in the highly disturbed agriculture lands that comprise the Ho'opili site. No invertebrate species listed as endangered, threatened, or that are currently proposed for listing under either federal or State of Hawai'i endangered species statutes are known to exist at the Project Site (DLNR 1997, Federal Register 1999, 2005).

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Appendix E

An Archaeological Inventory Survey for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu. Prepared for D. R. Horton - Schuler Division. Prepared by Cultural Surveys Hawai'i, Inc. July 2006.

An Archaeological Inventory Survey for the Ho'opili Project, Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu TMK: (1) 9-1-010:002, 9-1-017:004, 059, 072; 9-1-018:001, 004; 9-2-002:004, 005

Prepared for

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Prepared by

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Management Summary

Reference	An Archaeological Inventory Survey for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu, TMK: (1) 9-1-010:001, 9-1-017:004, 059, 072; 9-1-018:001, 004, 9-2-002:004, 005, by Constance R. O'Hare, David W. Shideler, and Dr. Hallett H. Hammatt
Date	August 2006
Project Number (s)	CSH Job Code: HONO 75
Investigation Permit Number	CSH completed the inventory survey fieldwork under state archaeological permit No. 0508 issued by the State Historic Preservation Division, per Hawai'i Administrative Rules (HAR) Chapter 13-13-282.
Project Location	The project area consists of several parcels which are identified by the following tax map key numbers: TMK:(1) 9-1-017:004, 059, 072; 9-1-018:001, 004; 9-1-010:002; and, and 9-2-002:004, 005. The main project area (TMK 9-1-017 and -018) is generally bound on the north by the H-1 Interstate (I H-1), on the south by Mango Tree Road (a dirt road along the Ewa Villages Golf Course), by Pelehua Drive on the west, and by Old Fort Weaver Road on the east. There are two non-contiguous parcels. The first (TMK 9-1-010:002) is on the east side of new Fort Weaver Road. The second (TMK 9-2-2-004, 005) is north of the H-1 Interstate within close proximity to a reservoir.
Land Owner	D.R. Horton-Schuler Division
Reviewing Agencies	State Historic Preservation Division / Department of Land and Natural Resources (SHPD/DLNR)
Project Description	The landowner plans to develop the project area into a mixed residential, commercial, and recreational property.
Project Acreage	1, 630 acres
Area of Potential Effect (APE)	For the purposes of this study the area of potential effect (APE) and the project area are considered one and the same.
Historic Preservation Regulatory Context	The client, D.R. Horton-Schuler Division proposed development of the Ho'opili Project lands constitutes a project requiring compliance with and review under State of Hawai'i historic preservation review legislation (Hawai'i Revised Statutes (HRS) Chapter 6E-42 and Hawai'i Administrative Rules (HAR) 13-284). At the request of D.R. Horton-Schuler Division, CSH completed an archaeological inventory survey investigation, per the requirements of HAR Chapter 13-13-276, of the subject 2625-acre parcel. This archaeological inventory survey report was prepared to support the proposed property's historic preservation review and any other project-related historic preservation consultation
Fieldwork Effort	Constance R. O'Hare, B.A., Owen O'Leary, M.A., Guadalupe Ochoa, B.A., Brad Garrett, M.A., and Jon Tulchin, B.A., under the general direction of Hallett H. Hammatt, Ph.D. conducted surface survey and subsurface testing in the project area. Field work was conducted on November 21, 22, 28, on December 8 and 9, 2005, and January 13, 2006.
Number of Historic Properties Identified	Five sites had been previously identified in a 1990 CSH survey (Hammatt and Shideler 1990). One of these sites (50-80-12-4344) was used to denote Ewa Sugar Plantation scattered infrastructure features. Three features (Features A-C) were recorded for this site during the 1990 survey, but they were destroyed somtime between 1990 and the present. During the recent 2005 surface survey, four additional sugar plantation features were recorded. These will be considered additional features (Features D-F) of Site -4344.

Historic Properties Recommended Eligible to the Hawai'i Register of Historic Places (Hawai'i Register)	Sites 50-80-12-4345 (railroad berm), -4346 (northern pumping station), -4347 (central pumping station), and -4348 (southern pumping station) are significant under Criteria C and D and are recommended for preservation. Site -4344 (plantation infrastructure), is considered signigicant under Criterion D only since three features first recorded in a 1990 survey have been destroyed. No further work or preservation is recommended for -4344. All five sites were revisited during the recent 2005 survey; four additional features were added to Site –4344.
Historic Properties Recommended Ineligible to the Hawai'i Register	Four areas of historic habitation (Honouliuli Taro Lands, Kapalani Catholic Church, PipeLine Village, and Drivers/Stable Village) were identified during the 1990 survey of a portion of the project area. No site designations were given, since there were no surface remains found during the survey. During the recent 2005 backhoe testing for the current project, no subsurface remains for these four habitation loci were found in the project area. No site designations are needed.
Mitigation Recommendation	Although no subsurface remains for four habitation loci were found during the recent backhoe testing of the four areas, it is recommended that a program of on-site/on-call monitoring be conducted during any future development of these four specific areas.

Table of Contents

Management Summary i

Section 1 Introduction 1

1.1 PROJECT BACKGROUND 1
1.2 SCOPE OF WORK 5
1.3 ENVIRONMENTAL SETTING 6
1.3.1 Natural Environment 6
1.3.2 Built Environment 7

Section 2 Methodology 9

2.1 FIELD METHODS 9
2.2 LABORATORY METHODS 13
2.3 CONSULTATION 13

Section 3 Documentary Research 15

3.1 MYTHOLOGICAL AND TRADITIONAL ACCOUNTS 15
3.1.1 The Naming of 'Ewa and Honouliuli 15
3.1.2 Pu'uokapolei and the Plains of Kaupa'e 17
3.1.3 Pearl Harbor (Pu'uloa) and West Loch (Kaihu o pala'ai) 22
3.2 HISTORIC BACKGROUND 28
3.2.1 Pre-Contact and Early Post-Contact Periods 28
3.2.2 Observations of Early Explorers and Foreign Residents 30
3.2.3 Mid-Nineteenth Century and the Māhele 34
3.2.4 Project Area Māhele Awards 34
3.2.5 The Catholic Church 38
3.2.6 Honouliuli Māhele Awards to *Ali'i* 40
3.2.7 Early Ranching in on the 'Ewa Plain 41
3.2.8 History of the Ewa Sugar Plantation 41
3.2.9 The Military and Modern Developments 50

Section 4 Previous Archaeological Research 54

4.1 EARLY ARCHAEOLOGICAL SURVEYS 54
4.2 PREVIOUS ARCHAEOLOGICAL WORK NEAR HONOULIULI TOWN 59
4.2.1 West Loch Estates 59
4.2.2 NAVMAG – West Loch 61
4.2.3 'Ewa Villages 62
4.2.4 'Ewa Gentry Project 62
4.2.5 Previous Archaeology in the Current Project Area 63
4.3 BACKGROUND SUMMARY AND PREDICTIVE MODEL 63
4.3.1 Honouliuli Settlement Patterns 63
4.3.2 The Coastal Zone - Kalaeloa (Barbers Point), Ko'ōlina (West Beach) 65
4.3.3 Honouliuli Taro Lands 65
4.3.4 Pu'uku'ua: Inland Settlement 66
4.3.5 Summary 67

Section 5 Results of Fieldwork 69

5.1 1990 SURVEY FINDINGS OF THE WEST LOCH BLUFFS PROJECT AREA 69
5.1.1 Sites Recorded during the 1990 Survey 73
5.1.2 Historically Documented Areas Identified during the West Loch Bluffs Project 74
5.2 2005 SURFACE INVENTORY SURVEY FINDINGS 79
5.3 2005 BACKHOE TEST EXCAVATIONS FINDINGS 87
5.3.1 Roman Catholic Churchyard 87
5.3.2 Honouliuli Taro Land Trenches 99
5.3.3 Drivers and Stable Villages 105
5.3.4 PipeLine Village 106

Section 6 Project Summary and Mitigation Recommendations 115

6.1 SIGNIFICANCE ASSESSMENTS 115
6.2 MITIGATION RECOMMENDATIONS 116

Section 7 References Cited 119

Appendix A 139

GPS METHODOLGY AND COORDINATES 139

List of Figures

Figure 1. US Geological Survey map (1998), Waipahu and Ewa quadrangles, showing project area (hatched area) 2
Figure 2. Tax Maps 9-1-010, 9-1-017, 9-1-018, and 9-2-002, showing project area (shaded red) .3
Figure 3. Planned Development for the Ho'opili Project Area (formerly called the East Kapolei Project) 4
Figure 4. Soil Map of Ho'opili Project Area (formerly called the East Kapolei Community Project Area) 8
Figure 5. Non-contiguous parcel east of Fort Weaver Road (TMK 9-2-002:004, 005), showing *koa haole* on western half and low grass on eastern half 10
Figure 6. Non-contiguous parcel north of the H-1 interstate, showing bulldozed reservoir area..10
Figure 7. 2000 Aerial photograph of main project area (TMK 9-1-017, 9-1-018), showing plowed fields 11
Figure 8. Aerial photograph of northern section of the project area taken near the intersection of H-1 Interstate and Fort Weaver Road; plowed fields in foreground, Honouliuli Gulch in background (shown by the alignment of trees) 12
Figure 9. Place Names of Honouliuli (map adapted from Sterling and Summers 1978) 16
Figure 10. Trails (dashed lines) of Leeward Oahu. Map by Paul Rockwood. ('Ī'ī 1959:96) Mid- to late-1800s 30
Figure 11. Portion of 1825 Map of the South Coast of Woahoo (O'ahu) and Honolulu by Lieut. C.R. Malden from the British ship the *Blonde* 31
Figure 12. Portion of 1873 W.D. Alexander map of Honouliuli, showing location of Kapapapuhi Point (habitation symbols are illegible); also note location of Kapalani Catholic Church33
Figure 13. 1878 Map of Honouliuli Taro Lands (LCAs) by M.D. Monsarrat, with inserted '*ili* names; project area is to the west of this map 36
Figure 14. Portion of 1878 Monsarrat map, showing portion of Honouliuli Taro Lands in relation to current alignment of Old Fort Weaver Road (eastern boundary of the project area) 37
Figure 15. Portion of 1881 Hawai'i Government Survey Map of O'ahu (Alexander), showing location of the Catholic Church 39
Figure 16. 1902 map showing relationship of Ewa Plantation and the Oahu Sugar Co. plantation; also note location of sisal growing area 42
Figure 17. 1939 map of the Ewa Plantation Co. lands, showing project area 43
Figure 18. Portion of an 1908/1913 U.S. Army Fire Control map, showing 47 houses in PipeLine Village; map also shows the alignment for the Ewa Plantation railway (project area shaded in dark gray) 45
Figure 19. 1927/1928 US Geological Survey map, showing location of PipeLine Village, Stable Village, Driverss Village, and other Ewa Plantation structures 46
Figure 20. Portuguese family residence at PipeLine Village 1906 47
Figure 21. Discharge Pump No. 5, PipeLine Village 1907 47
Figure 22. PipeLine Village, famly houses built in 1909, photograph taken on January 1910 48
Figure 23. PipeLine Village, April 7, 1907; *forno* (Portuguese brick bread oven) at center of photograph 48
Figure 24. U.S. Geological Survey topographic map, showing previous archaeological survey areas near the current project area 60

Figure 25. Revised map from 1990 inventory survey report (Hammatt and Shideler 1990), showing location of recorded sites and historically documented areas of concern 70
Figure 26. Site 50-80-12-4345, Stone-faced berm for Ewa Plantation railroad, view to the north71
Figure 27. Site 50-80-12-4346, northern pumping station, view to the northwest 71
Figure 28. Site 50-80-12-4347, well wall of central pumping station, view to the north 72
Figure 29. Site 50-80-12-4348, interior well of southern pumping station, view to the west 72
Figure 30. 1907 photograph of residence at PipeLine Village 77
Figure 31. Undated photo of PipeLine Village, showing rows of houses 77
Figure 32. 1910 photograph of Puerto Rican family in PipeLine Village 78
Figure 33. 1907 photograph of Portuguese family at PipeLine Village 78
Figure 34. US Geological Survey map, showing location of Features D-F of Site 50-80-12-4344 along Honouliuli Stream 80
Figure 35. Typical vegetation in Honouliuli Gulch, view to the south 81
Figure 36. Feature D, Linear Wall abutting gulch rim, view to the north (upslope) 83
Figure 37. Feature D, Linear Wall, profile of 1.0 meter section 83
Figure 38. Feature E, Linear Wall, built perpendicular to orientation of Honouliuli Gulch, view to the east (upslope) 84
Figure 39. Feature E, Linear Wall, plan view 84
Figure 40. Feature F, Stone-faced berm, built perpendicular to orientation of Honouliuli Stream, view to the west (downlsope) 85
Figure 41. Feature F, Linear Wall of Berm, profile of 1.0 m faced wall section 85
Figure 42. Feature G, concrete ditch, view to the west (upslope) 86
Figure 43. Feature G basin, showing steel pipe extending downslope to Honouliuli Stream, view to the south 86
Figure 44. US Geological Survey map, showing four areas selected for backhoe testing and location of five recorded sites 88
Figure 45. US Geological Survey map, showing location of Backhoe Trenches 1-19; red shaded areas show former locations of Honouliuli Taro Lands, Roman Catholic Church, Stables/Driver Village, and Pipeline Village 89
Figure 46. Backhoe Trench 1, north wall profile 90
Figure 47. Backhoe Trench 2, south wall profile 91
Figure 48. Backhoe Trench 1 photo, south wall profile 92
Figure 49. Backhoe Trench 2 photo,view to the east 92
Figure 50. Backhoe Trench 3, north wall profile 93
Figure 51. Backhoe Trench 4, north wall profile 94
Figure 52. Backhoe Trench 5, east wall profile 95
Figure 53. Backhoe Trench 6, north wall profile 96
Figure 54. Backhoe Trench 19, east wall profile 97
Figure 55. Trench 5 photo, east wall profile 98
Figure 56. Trench 19 photo, east wall profile 98
Figure 57. Backhoe Trench 7, south wall profile 99
Figure 58. Backhoe Trench 8, north wall profile 100
Figure 59. Trench 7 photo, south wall profile 101
Figure 60. Trench 8, north wall profile 101
Figure 61. Backhoe Trench 9, south wall profile 102

Figure 62. Backhoe Trench 10, east wall profile 102
Figure 63. Backhoe Trench 9 photo, south wall profile 103
Figure 64. Backhoe Trench 10 photo, east wall profile 103
Figure 65. Backhoe Trench 11, west wall profile 104
Figure 66. Backhoe Trench 12, east wall profile 105
Figure 67. Trench 12 photo, east wall profile 106
Figure 68. Backhoe Trench 13, north wall profile 107
Figure 69. Backhoe Trench 14, east wall profile 108
Figure 70. Backhoe Trench 13 photo, north wall profile 109
Figure 71. Backhoe Trench 14, east wall profile 109
Figure 72. Backhoe Trench 15, east wall profile 110
Figure 73. Backhoe Trench 16, south wall profile 111
Figure 74. Backhoe Trench 17, north wall profile 112
Figure 75. Backhoe Trench 16 photo, view to the east 113
Figure 76. Trench 17 photo, north wall profile 113
Figure 77. Backhoe Trench 18, north wall profile 114
Figure 78. Areas of concern for significance and mitigation recommendations 118

List of Tables

Table 1.Contact List of Community Members and Organizations for a Cultural Impact Assessment....13
Table 2. Summary of land use and boundary landmarks recorded in Honouliuli LCA awards (see Figure 13 for '*ili* locations)....35
Table 3. Previous archaeological work in Honouliuli and Pu'uloa....55
Table 4. Sites Previously Identified during the 1990 CSH survey....69
Table 5. Significance and Mitigation Recommendations....117
Table 6. UTM coordinates for recorded sites and features....139

Section 1 Introduction

1.1 Project Background

At the request of D.R. Horton-Schuler Division (828 Fort Street Mall, 4th Floor, Honolulu, Hawai'i 96813), Cultural Surveys Hawai'i, Inc. (CSH) has completed this Inventory Survey Report for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island (TMK: [1] 9-1-010:002; 9-1-017:004, 059, 072; 9-1-018:001, 004; 9-2-002:004, 005) (Figures 1 and 2). The main project area is generally bound on the north by the H-1 Interstate (I H-1), on the south by Mango Tree Road (a dirt road along the Ewa Villages Golf Course), by Pelehua Drive on the west, and by Old Fort Weaver Road on the east. There are two non-contiguous sections, a parcel on the east side of West Loch Estates and a parcel north of the H-1 Interstate, surrounding a reservoir. In all, the project area is approximately 1,630 acres. The landowner, D.R. Horton-Schuler Division, plans to develop this area into a mixed residential, commercial, and recreational property (Figure 3).

CSH previously worked on the eastern 546-acres of these lands in 1990 in association with what was then known as the West Loch Bluffs project (Hammatt and Shideler 1990). In the course of this study, we were able to determine that the eastern lands of the present project area contain more historic resources than one might guess, including such features as:

- A northern pumping station;
- a central pumping station complex;
- a southern pumping station;
- the former site of PipeLine Village;
- the former site of Drivers and Stable Villages;
- the former site of Hawaiian Land Commission Awards and former Hawaiian Homesteads;
- the former site of the Honouliuli "Kapalani" Roman Catholic Church;
- a well preserved portion of the Ewa Plantation Company railroad berm; and,
- the site of the first artesian well in Hawai'i.

Based on the presence of these sites and presumably others, CSH recommended an inventory survey that included both surface and subsurface investigation. Based on the known data, subsurface testing with a backhoe was needed during the inventory survey. Backhoe testing focused on locating and evaluating subsurface deposits, such as buried cultural layers, artifacts, and possibly burials that can not be located by surface pedestrian inspection. Backhoe testing was conducted in four areas, at the site of the nineteenth century Kapalani Church, the area of Hawaiian Land Commission Awards, the location of Drivers/Stable Village, and the location of PipeLine Village, with its associated church.

The archaeological inventory survey and its accompanying report documents all historic properties within the subject parcel. This current inventory survey report is in compliance with state standards and will be submitted for review and approval to the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR).

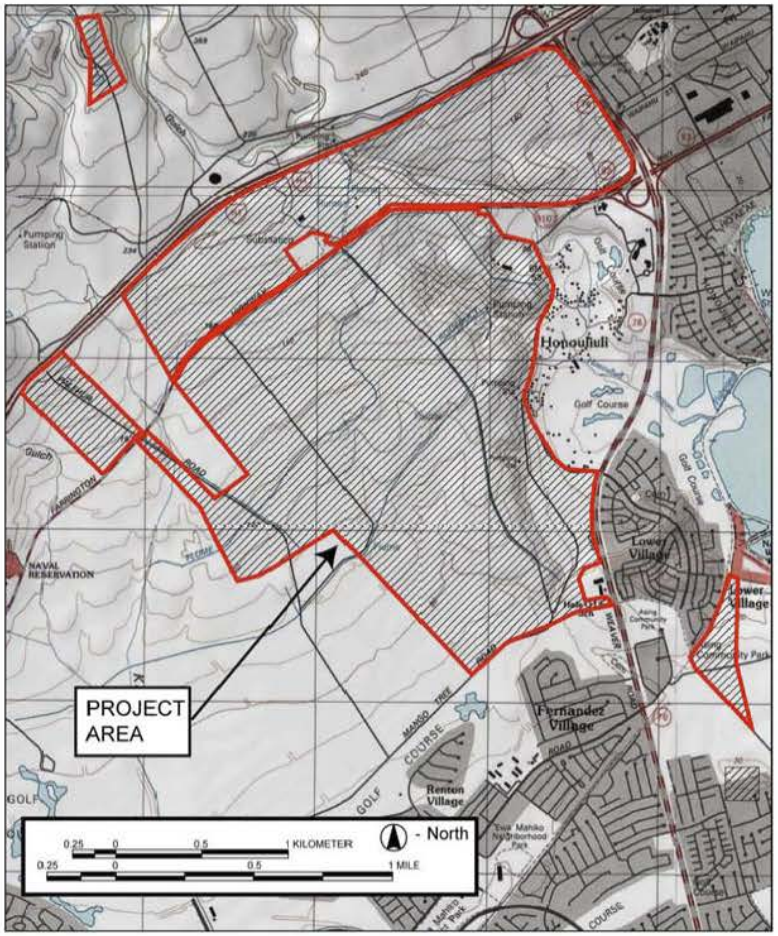

Figure 1. US Geological Survey map (1998), Waipahu and Ewa quadrangles, showing project area (hatched area)

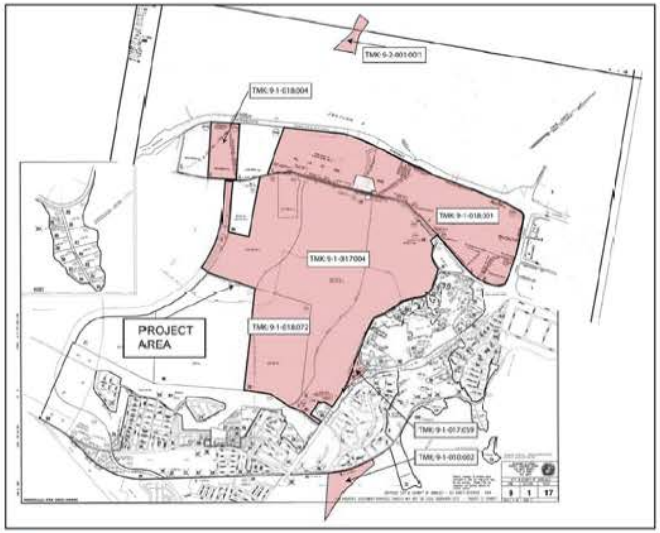

Figure 2. Tax Maps 9-1-010, 9-1-017, 9-1-018, and 9-2-002, showing project area (shaded red)

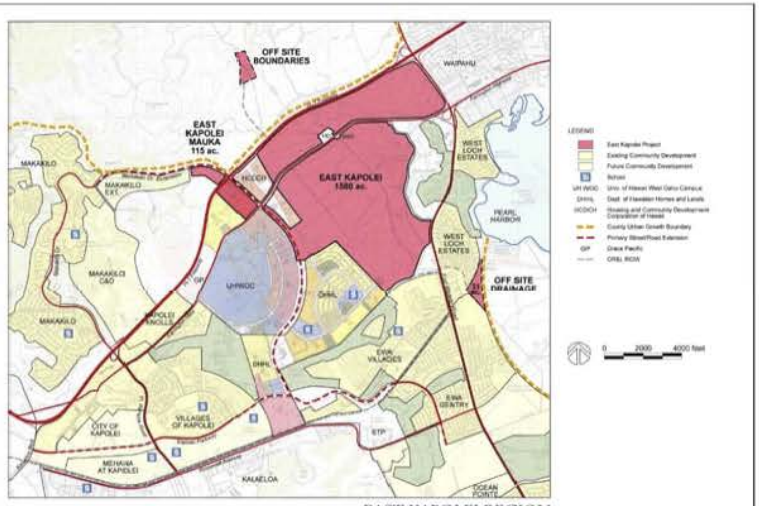

Figure 3. Planned Development for the Ho'opili Project Area (formerly called the East Kapolei Project)

1.2 Scope of Work

The following archaeological inventory survey scope of work satisfies the State and County requirements:

1. State rules have recently been established which require consultation with community members as part of the inventory survey process. This consultation requires contacting knowledgeable members of the community and requesting information on historic and cultural issues related to the property. The compete results of these consultations are presented in a separate CSH report (Souza and Hammatt 2006).
2. A complete ground survey of the entire project area for the purpose of site inventory was conducted. All sites were located, described, and mapped with evaluations of function, interrelationships, and significance. Documentation included photographs and scale drawings of selected sites and complexes. All sites were assigned State site numbers.
3. Subsurface testing was conducted to determine if subsurface deposits were located in the project area. No appropriate samples, which could have been analyzed for chronological and paleoenvironmental information from these excavations were found; therefore, no laboratory analysis was conducted.
4. Research on historic and archaeological background, including search of historic maps, written records, and Land Commission Award documents was conducted. This research focused on the specific area with general background on the *ahupua'a* and information on settlement patterns of the district.
5. A survey report was prepared and includes the following:
    a. A topographic map of the survey area showing all archaeological sites and site areas;
    b. a description of all archaeological sites with selected photographs, scale drawings, and discussions of function;
    c. historical and archaeological background sections summarizing prehistoric and historic land use as they relate to the archaeological features;
    d. a summary of site categories and their significance in an archaeological and historic context; and,
    e. recommendations based on all information generated that specify what steps should be taken to mitigate impact of development on archaeological resources - such as data recovery (excavation) and/or preservation of specific areas. These recommendations were developed in consultation with the client and the State agencies.

This scope of work also includes full coordination with the State Historic Preservation Division (SHPD), and County relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

1.3 Environmental Setting

1.3.1 Natural Environment

Honouliuli Ahupua'a is the largest traditional land unit on O'ahu, extending from the West Loch of Pearl Harbor in the east, to the border of Nānākuli Ahupua'a at Pili o Kahe in the west. Honouliuli Ahupua'a includes approximately 19 km (kilometers), or 12 mi (miles) of open coastline from One'ula westward to Pili o Kahe. The *ahupua'a* extends *mauka* (inland) from West Loch nearly to Schofield Barracks in Wahiawā. The western boundary is the Wai'anae Mountain crest running north as far as Pu'u Hāpapa (or to the top of Ka'ala Mountain, according to some).

Topographically, the portion of the project area to the south of Farrington Highway is most notable for a scarp feature, typically 50 ft (feet), or 15 m (meters) high, which runs roughly north/south through the southeastern portion of the project area. This scarp is a Pleistocene fossil sea bluff. In the northern portion of the project area, the land is generally flat, except along Honouliuli Gulch, which runs through the center of this northern portion.

Lying in the lee of the Wai'anae mountain range, the project area is one of the driest areas of O'ahu with most of the area averaging about 18 inches of rainfall annually (Juvik and Juvik 1998:56). Temperatures range between 60° to 90°F through the year; the highest temperatures are in August and September (Armstrong 1973). Elevation in the project area ranges from 40 ft AMSL (above mean sea level) to 240 ft (12-73 m). The project area is located on the 'Ewa Plain, which is a Pleistocene (>38,000 years old) reef platform overlain by alluvium from the southern end of the Wai'anae Mountain Range. This alluvium supported commercial sugar cane cultivation for over a century. Honouliuli Stream extends (roughly northwest to southeast) through the center of the northern section (between I H-1 and Farrington Highway) of the main project area.

In pre-contact Hawai'i the project area would have been mostly lowland dry shrub and grassland, dominated by species such as *wiliwili* (*Erythrina sandwicensis*), *lama* (*Diospyros ferrea*), sandalwood (*Santalum* sp.), *'a'ali'i* (*Dodonea eriocarpa*), scrub *'ōhi'a* (*Metrosideros collina*) and *pili* grass (*Heteropogon contortus*). In contrast, the non-cultivated portions of the project area are currently dominated by introduced species such as *kiawe* and *koa haole*. Understory plants include *'ilima ku kula* (*Sida cordifola*), cayenne vervain (*Stachytarpheta urticaefolia*), *ko'oko'olau* (*Bidens pilosa*), and morning glory (*Ipomoea indica*) (Moore and Kennedy 2002:3). The vast majority of the project area presently consists of plowed fields, with crops of pumpkins, squash, cucumbers, bananas, beans, and other vegetable products.

A total of ten soil series are found in the project area (Figure 4). The Ewa Series consists of well-drained soils in basins and on alluvial fans, developed in alluvium derived from basic igneous rock. They are nearly level to moderately sloping. These soils are used for sugarcane, truck crops, and pasture. The Helemano series consists of well-drained soils on alluvial fans and colluvial slopes on the sides of gulches, which developed in alluvium and colluvium derived from basic igneous rock. They are steep to extremely steep. These soils are used for pasture, woodland, and wildlife habitat. The Honouliuli series consists of well-drained soils on coastal plains; the soils developed in alluvium derived from basic igneous material. They are nearly level and gently sloping. These soils are used for sugarcane, truck crops, orchards, and pasture.

The Kaloko Series consists of poorly drained soils on coastal plains. These soils developed in alluvium derived from basic igneous rock; the alluvium has been deposited over marly lagoon deposits. The soils are nearly level. These soils are used for irrigated sugarcane and pasture. The Kawaihapai Series consists of well-drained soils in drainageways and on alluvial fans on the coastal plains. The soils formed in alluvium derived from basic igneous rock in humid uplands. These soils are used for sugarcane, truck crops, and pasture. The Keaau Series consists of poorly drained soils on coastal plains, which developed in alluvium deposited over reef limestone or consolidated coral sand. They are nearly level and gently sloping. These soils are used for sugarcane and pasture. The Kunia Series consists of well-drained soils on upland terraces and fans; the soils developed in old alluvium. They are nearly level to moderately sloping. These soils are used for sugarcane, pineapple, homesites, and military reservations. The Molokai Series consists of well-drained soils on uplands, formed in material weathered from basic igneous rock. They are nearly level to moderately steep. These soils are used for sugarcane, pineapple, pasture, wildlife habitat, and homesites. The Waialua Series consists of moderately well drained soils on alluvial fans; these soils developed in alluvium weathered from basic igneous rock. They are nearly level to steep. These soils are used for sugarcane, truck crops, orchards, and pasture. The Waipahu Series consists of well-drained soils on marine terraces, which developed in old alluvium derived from basic igneous rock. They are nearly level to moderately sloping. These soils are used for sugarcane and homesites (Foote et al. 1972).

Four sections of the project area were selected for backhoe testing. Honouliuli clay, 0 to 2 percent slopes (HxA) is found adjacent to Old Fort Weaver Road where seven trenches were placed to test for the remains of a nineteenth century Catholic Church (Kapalani Church) and where one trench was placed to test for the remains of a early twentieth century plantation village (Drivers/Stable Village). This soil occurs in the lowlands along the coastal plains. Waialua silty clay, 0 to 3 percent slopes (WkA) is found adjacent (and west) of the HxA soils in the Kapalani Church testing area. This soil is found on smooth coastal plains. Waipahu silty clay, 0 to 2 percent slopes (WzA) is the dominant soil on the top of the scarp. Two areas selected for backhoe testing, the remains of PipeLine Village, and the Honouliuli Taro Lands, had this soil type. This soil is nearly level and occurs on dissected terraces near the ocean. Waipahu silty clay, 2 to 6 percent slopes (WzB) also occurred in the Honouliuli Taro Lands backhoe testing area.

1.3.2 Built Environment

During the post-contact period, the project area was primarily used for pastureland and for sugar cane irrigation and cultivation. Currently, the project area is used for diversified agricultural activities, pastureland, seed cultivation, and other uses.

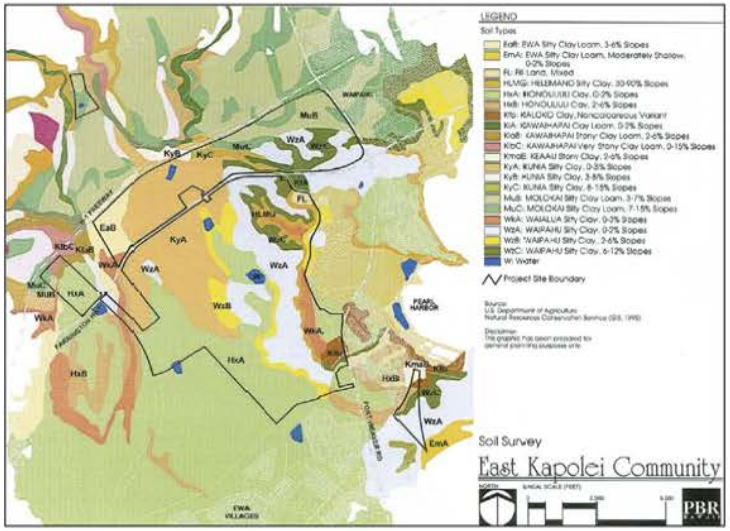

Figure 4. Soil Map of Ho'opili Project Area (formerly called the East Kapolei Community Project Area)

Section 2 Methodology

For this report, CSH reviewed previous archaeological studies on file at the State Historic Preservation Division. CSH also reviewed geology and cultural history documents at Hamilton Library at the University of Hawai'i, the Hawai'i State Archives, the Hawai'i Public Library, and the Archives of the Bishop Museum. Additional research included a study of historic photographs at the Archives of the Bishop Museum and a study of historic maps at the Survey Office of the Department of Accounting and General Services. Information regarding LCAs was obtained from the Waihona 'Āina Corporation's Māhele Data Base (www.waihona.āina.com).

2.1 Field Methods

The pedestrian inspection of the main project area was conducted on November 21 and 22, 2005 with four Cultural Surveys Hawai'i staff archaeologists, Constance R. O'Hare, B.A., Owen O'Leary, M.A., Guadalupe Ochoa, B.A., and Brad Garrett, M.A., under the general direction of Hallett H. Hammatt, Ph.D. On January 13, 2006, the two small non-contiguous parcels of the project were surveyed (Figures 5 and 6). At least 75% of the project area has been denuded of all natural vegetation and has been recently plowed and planted with pumpkins, squash, and other vegetables (Figure 7). There are a few areas marked off for other crops, such as bananas and beans. All areas outside plowed fields were surveyed on foot. In the northern section of the project area (north of Farrington Highway) the northwest corner and a larger area to the east of Honouliuli Gulch was surveyed by pedestrian sweeps. Honouliuli Gulch was surveyed by a team of three archaeologists, one sweep moving downstream on one bank and a second sweep moving upstream on the opposite bank (Figure 8). In the southern section, the non-plowed areas surrounding the underground pipelines were surveyed. Sites previously identified during the 1990 CSH survey (Hammatt and Shideler 1990) of the eastern 546-acre parcel were revisited and additional notes were taken on their construction and their current condition.

All significant historic properties encountered were recorded and documented with a brief written field description, a sketch map, and photographs. The location of each newly identified feature within the project area was recorded with a high precision (sub-0.5 m) GPS unit, a Trimble Pro XR backpack GPS unit with a TSCI Datalogger. The data collected using the Trimble GPS unit was processed using ESRI's Arc Surveyor 5.0 and ArcGIS 9.1.

In total, in addition to the five previously identified sites found during the CSH 1990 survey (Hammatt and Shideler 1990; see Introduction section), four new features, all found along Honouliuli Gulch, were recorded. All features were initially given CSH temporary numbers (CSH 1-4), and were later given feature designations as part of a previously designated site, 50-80-12-4344, a site number used for sugar cane plantation infrastructure features. Each excavation trench location was also plotted using GPS survey technology.

Sub-surface testing was conducted in four specific portions of the project area; areas that could potentially contain buried cultural layers or artifacts. This testing was conducted on November 28, and December 8 and 9, 2005 by CSH archaeologists Constance R. O'Hare, B.A., Owen O'Leary, M.A., Guadalupe Ochoa, B.A., Brad Garrett, M.A., and Jon Tulchin, B.A., under the general direction of Hallett H. Hammatt, Ph.D. Subsurface testing consisted of the excavation of 19 backhoe trenches. These trenches were excavated to a total depth of 2.0-3.0 m. A 70 cm

Figure 5. Non-contiguous parcel east of Fort Weaver Road (TMK 9-2-002:004, 005), showing *koa haole* on western half and low grass on eastern half

Figure 6. Non-contiguous parcel north of the H-1 interstate, showing bulldozed reservoir area

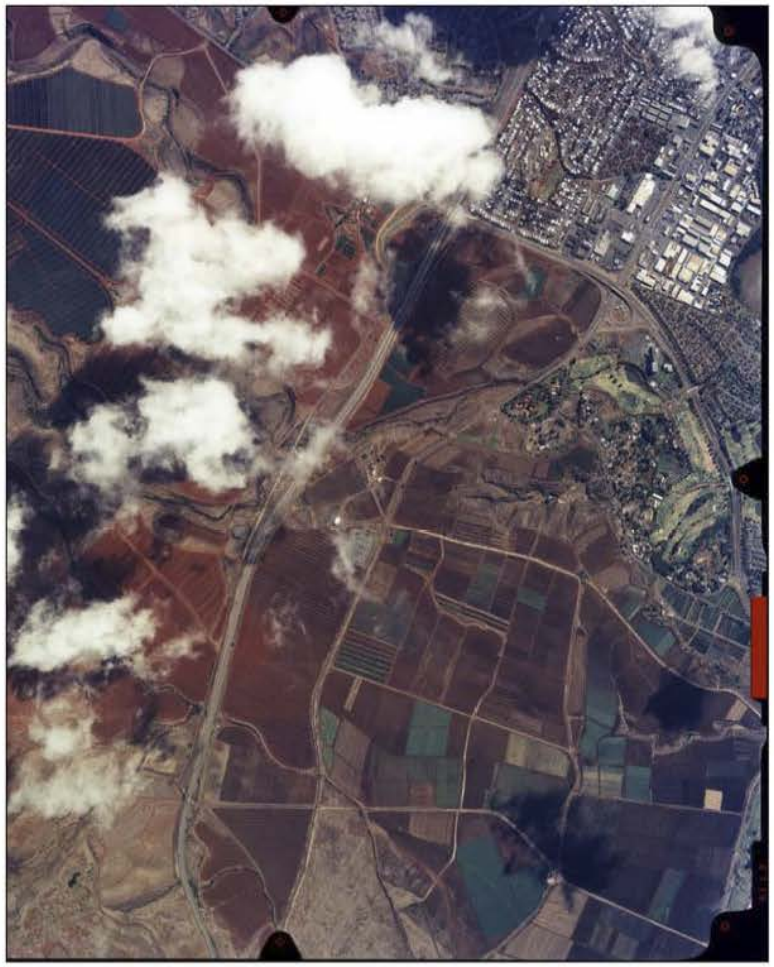

Figure 7. 2000 Aerial photograph of main project area (TMK 9-1-017, 9-1-018), showing plowed fields

Figure 8. Aerial photograph of northern section of the project area taken near the intersection of H-1 Interstate and Fort Weaver Road; plowed fields in foreground, Honouliuli Gulch in background (shown by the alignment of trees)

(centimeter) wide bucket was used on the backhoe, and one-bucket width trenches were dug. All excavations were closely monitored by CSH personnel. Trenches were placed to test for subsurface deposits in four specific former habitation loci, as well as to provide adequate coverage of these four areas. The location of each backhoe trench within the project area was also recorded with a high precision (sub 0.5 m) GPS unit (Trimble Pro XR backpack GPS unit with a TSCI Datalogger). The data collected using the Trimble GPS unit was processed using ESRI's Arc Surveyor 5.0 and ArcGIS 9.1.

The stratigraphy of one profile wall was drawn and photographed; sediments were described for each of the 19 trenches. Sediment descriptions include Munsell color, texture, consistence, structure, plasticity, cementation, origin of sediments, descriptions of inclusions, lower boundary distinctiveness and topography, and other general observations. Fieldwork was conducted under state archaeological fieldwork permit No. 0508 issued by SHPD, per Hawai'i Administrative Rules (HAR) Chapter 13-13-282. The field effort, the surface pedestrian survey (2 days with a crew of 3-4 people), and the subsurface testing with a backhoe required 23 person-days to complete.

2.2 Laboratory Methods

Because no archaeological artifacts were discovered, no laboratory work was undertaken.

2.3 Consultation

As partial fulfillment for the Scope of Work (SOW), consultation with organizations and the community are currently being conducted to identify *kūpuna* and other individuals with knowledge of the history of the project area and its surroundings. The results of these interviews will be presented in a companion report for this project, titled "Cultural Impact Assessment for the Ho'opili Project (Souza and Hammatt 2006)." The on-going consultation with organizations include the Office of Hawaiian Affairs, the O'ahu Island Burial Council, 'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club, 'Ewa Task Force, 'Ewa Neighborhood Board, Hawai'i Plantation Village, and Immaculate Conception Church in 'Ewa. A table of informants that will be contacted is presented below:

Table 1.Contact List of Community Members and Organizations for a Cultural Impact Assessment

Name	Affiliation
Aila, William	Hui Malama
Alexander, Jeff	'Ewa Neighborhood Board Member
Bautista, Gary	'Ewa Neighborhood Board Member (Chair)
Cayan, Coochie	O'ahu Island Burial Council
Eaton, Arline	*Kūpuna* at Iroquois Elementary School
Hirata, Richard	President of Hawai'i Plantation Village; he was raised at the Ewa Plantation
Kane, Shad	Makakilo, Kapolei, Honokai Hale Neighborhood Board Member
Malama, Tesha	Former 'Ewa Neighborhood Board member
Nāmu'o, Clyde	Administrator at Office of Hawaiian Affairs
Oshiro, Richard	Former Ewa Plantation employee

Name	Affiliation
Paishon, Frank	Raised in Tenney Village
Ramos, Rodolfo	Chair of 'Ewa Task Force
Sato, Melvin	Raised in Ewa Plantation "C" Village
Serrao, Mary	President of Pu'uloa Outrigger Canoe Club
Soma, Millie	Raised in Ewa Plantation Tenney Village
Soma, Kenneth	Former Ewa Plantation Employee and resident
Quintal, Leti	Raised in Ewa Plantation Secretary for the Immaculate Conception Church

Section 3 Documentary Research

3.1 Mythological and Traditional Accounts

The traditions of Honouliuli Ahupua'a have been compiled by several authors, in studies by Sterling and Summers (1978), Hammatt and Folk (1981), Kelly (1991), Charvet-Pond and Davis (1992), Maly (1992), and Tuggle and Tomonari-Tuggle (1997a). Some of the traditional themes associated with this area include connections with Kahiki, the traditional homeland of Hawaiians in central Polynesia. There are several versions of the chief Kaha'i leaving from Kalaeloa for a trip to Kahiki; on his return to the Hawaiian Islands he brought back the first breadfruit (Kamakau 1991a:110) and planted it at Pu'uloa, near Pearl Harbor in 'Ewa (Beckwith 1940:97). Several stories associate places in Honouliuli to the gods Kāne and Kanaloa, with the Hawaiian pig god Kamapua'a and the Hina family, and with the sisters of Pele, the Hawaiian volcano goddess, all of who have strong connections with Kahiki (Kamakau 1991a:111; Pukui et al. 1974:200). The locations of traditional places names for Honouliuli are illustrated in Figure 9.

3.1.1 The Naming of 'Ewa and Honouliuli

Honouliuli is the largest *ahupua'a* in the *moku* (district) of 'Ewa. One translation of the name for this district is given as "unequal" (*Saturday Press* Aug. 11, 1883). Others translate the word as "strayed" and associate it with the legends of the gods, Kāne and Kanaloa.

> When Kane and Kanaloa were surveying the islands they came to Oahu and when they reached Red Hill saw below them the broad plains of what is now Ewa. To mark boundaries of the land they would throw a stone and where the stone fell would be the boundary line. When they saw the beautiful land lying below them, it was their thought to include as much of the flat level land as possible. They hurled the stone as far as the Waianae range and it landed somewhere, in the Waimanalo section. When they went to find it, they could not locate the spot where it fell. So Ewa (strayed) became known by the name. The stone that strayed [Told to E.S. by Simeon Nawaa, March 22, 1954; cited in Sterling and Summers 1978:1].

Honouliuli means "dark water," "dark bay," or "blue harbor" and was named for the waters of Pearl Harbor (Jarrett 1930:22), which marks the eastern boundary of the *ahupua'a*. The Hawaiians called Pearl Harbor, Pu'uloa (*lit.* long hill). Another explanation for the names comes from the "Legend of Lepeamoa", the chicken-girl of Pālama. In this legend, Honouliuli is the name of the husband of the chiefess Kapālama and grandfather of Lepeamoa (Thrum 1923:164-184). "Her grandfather gave his name, Honouliuli to a land district west of Honolulu . . ." (Thrum 1923:170). Westervelt (1963:209) gives an almost identical account.

It seems likely the boundaries of the western-most *ahupua'a* of 'Ewa were often contested with Wai'anae people. The 'Ewa people could cite divine sanction that the dividing point was between two hills at Pili o Kahe:

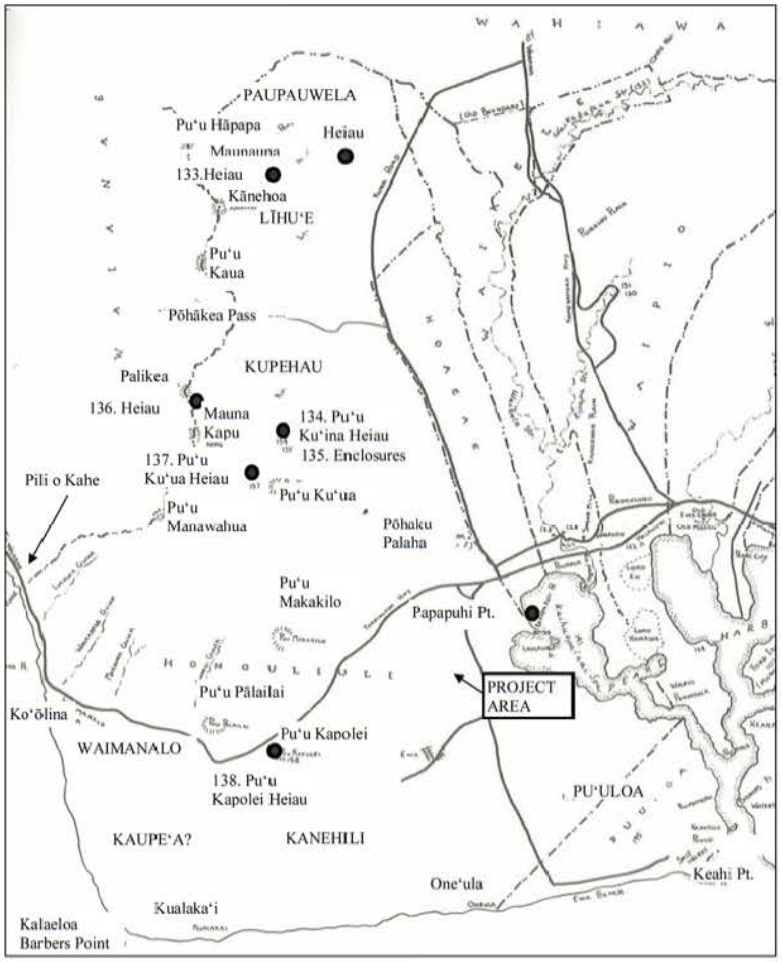

Figure 9. Place Names of Honouliuli (map adapted from Sterling and Summers 1978)

Eventually the stone was found at Pili o Kahe. This is a spot where two small hills of the Wai'anae Range come down parallel on the boundary between Honouliuli and Nānākuli ('Ewa and Wai'anae). The ancient Hawaiians said the hill on the 'Ewa side was the male and the hill on the Wai'anae side was female. The stone was found on the Waianae side hill and the place is known as Pili o Kahe.

> (Pili=cling to, Kahe=flow). The name refers, therefore, to the female or Waianae side hill. And that is where the boundary between the two districts runs [Told to E.S. by Simeon Nawaa, March 22, 1954; cited in Sterling and Summers 1978:1].

3.1.2 Pu'uokapolei and the Plains of Kaupa'e

Pu'uokapolei is a prominent hill at the *mauka* edge of the coastal 'Ewa Plains and was the primary landmark for travelers on the trail that ran from Pearl Harbor west to Wai'anae ('Ī'ī 1959:27, 29; M.K. Nakuina 1992:54; E.M. Nakuina 1904, in Sterling and Summers 1978:34).

3.1.2.1 Pu'uokapolei, Astronomical Marker and Heiau

Pu'u means hill and Kapolei means "beloved Kapo," a reference to the sister of the Hawaiian volcano goddess, Pele. Samuel Kamakau says that ancient Hawaiians used Pu'uokapolei as an astronomical marker to designate the seasons:

> . . . the O'ahu people who reckoned the time (*Oahu po'e helu*) called the season Kau [summer] for the setting of the sun from Pu'uokapolei, a hill in Honouliuli, 'Ewa, to the opening of Mahinaona (*i ke kawaha o Mahinaona*). When the sun moved south from Pu'uokapolei—and during the season of the sun in the south—for the coming of coolness and for the sprouting of new buds on growing things—the season was calle d Ho'oilo [winter, rainy, season] [Kamakau 1976:14]

A *heiau* was once on Pu'uokapolei, but had been destroyed by McAllister's (1933:108) survey of the island in the early 1930s. The hill was used as a point of solar reference or as a place for such observations (Fornander 1919, Vol. VI, Part 2:292). Pu'uokapolei may have been regarded as the gate of the setting sun, just as the eastern gate of Kumukahi in Puna is regarded as the rising sun; both places are associated with the Hawaiian goddess Kapo (Emerson 1915:41). This somewhat contradicts some Hawaiian cosmologies, in which Kū was the god of the rising sun, and Hina, the mother of Kamapua'a was associated with the setting sun. Fornander (Fornander 1919, Vol. VI, Part 2:292) states that Pu'uokapolei may have been a jumping off place (also connected with the setting sun) and associated with the wandering souls who roamed the plains of Kaupe'a and Kāne-hili, *makai* of the hill.

3.1.2.2 Pu'uokapolei and the Plains of Kaupe'a and Kāne-hili

Hi'iaka sang this bitter chant addressed to Lohiau and Wahine-oma'o, which uses the association of the Plains of Kaupe'a as a place for the wandering of lost souls:

> *Ku'u aikana i ke awa lau o Pu'uloa,*
> *Mai ke kula o Pe'e-kaua, ke noho oe,*
> *E noho kaua e kui, e lei i ka pua o ke kauno'a,*

I ka pua o ke akuli-kuli, o ka wili-wili;
O ka iho'na o Kau-pe'e i Kane-hili,
Ua hili au; akahi no ka hili o ka la pomaika'i;
E Lohiau ipo, e Wahine-oma'o,
Hoe 'a mai ka wa'a i a'e aku au.

We meet at Ewa's leaf-shaped lagoon, friends;
Let us sit, if you will on this lea
And bedeck us with wreaths of Kauno'a,
Of akuli-kuli and wili-wili,
My soul went astray in this solitude;
It lost the track for once, in spite of luck,
As I came down the road to Kau-pe'a.
No nightmare dream was that which tricked my soul.
This way, dear friends; turn the canoe this way;
Paddle hither and let me embark
[Emerson 1915:167-168].

Several other Honouliuli places are mentioned in this chant, including Pe'e-kaua, which may be a variation of Kau-pe'e or Kaupe'a, and the plains of Kānehili, the last of which again refers to wandering, as the word *hili* means "to go astray" (Emerson 1915:162). In the chant, Hi'iaka is moving downhill from Kaupe'a, probably the plains adjacent to Pu'uokapolei, toward the coast, the plain of Kānehili.

3.1.2.3 The plains of Kaupe'a and Pu'uokapolei and the Realm of Homeless Souls

There are several places on the 'Ewa coastal plain that are associated with *ao kuewa*, the realm of the homeless souls. Samuel Kamakau (1991a:47-49) explains the Hawaiian beliefs in the afterlife:

> . . . There were three realms (*ao*) for the spirits of the dead. . . There were, first, the realm of the homeless souls, the *ao kuewa*; second, the realm of the ancestral spirits, the *ao 'aumakua*; and third, the realm of Milu, *ke ao o Milu* . . .
>
> The *ao kuewa*, the realm of homeless souls, was also called the *ao 'auwana*, the realm of wandering souls. When a man who had no rightful place in the '*aumakua* realm (*kanaka kuleana 'ole*) died, his soul would wander about and stray amongst the underbrush on the plain of Kama'oma'o on Maui, or in the *wiliwili* grove of Kaupe'a on Oahu. If his soul came to Leilono [in Halawa, 'Ewa near Red Hill], there he would find the breadfruit tree of Leiwalo, *ka'ulu o Leiwalo*. If it was not found by an '*aumakua* soul who knew it (*i ma'a mau iaia*), or one who would help it, the soul would leap upon the decayed branch of the breadfruit tree and fall down into endless night, *the pō pau 'olo o Milu*. Or, a soul that had no rightful place in the '*aumakua* realm, or who had no relative or friend (*makamaka*) there who would watch out for it and welcome it, would slip over the flat lands like a

> wind, until it came to a leaping place of souls, a *leina a ka 'uhane*. . . . [Kamakau 1991b:47].
>
> On the plain of Kaupe'a beside Pu'uloa [Pearl Harbor], wandering souls could go to catch moths (*pulelehua*) and spiders (*nanana*). However, wandering souls could not go far in the places mentioned earlier before they would be found catching spiders by 'aumakua souls, and be helped to escape. . . . [Kamakau 1991b:49].

The breadfruit tree Leilono was said to have been located on the 'Ewa-Kona border, above Āliamanu. In another section of his account of the dead, Kamakau calls the plain of wandering souls the "plain at Pu'uokapolei."

> There are many who have died and have returned to say that they had no claim to an 'aumakua [realm] (*kuleana'ole*). These are the souls, it is said, who only wander upon the plain of Kama'oma'o on Maui or on the plain at Pu'uokapolei on Oahu. Spiders and moths are their food [Kamakau 1991a:29].

This association of Pu'uokapolei and Kānehili with wandering souls is also illustrated in a lament on the death of Kahahana, the paramount chief of O'ahu, who was killed by his father, Kahekili, after Kahahana became treacherous and killed the high priest Kaopulupulu.

Go carefully lest you fall dead in the sun,	*E newa ai o hea make i ka la,*
The god that dwells on Kapolei hill.	*Akua noho la i Puuokapolei.*
The sun is wailing on account of the women of Kamao,	*E hanehane mai ana ka la i na wahine o Kamao,*
A hiding god, blossoming ohai of the banks,	*Akua pee, pua ohai o ke kaha,*
Contented among the stones-	*I walea wale i ke a-*
Among the breadfruit planted by Kahai.	*I ka ulu kanu a Kahai.*
Thou wast spoken of by the oo-	*Haina oe e ka oo-*
By the bird of Kanehili.	*E ka manu o Kanehili.*

[Fornander 1919, Vol. VI, Part 2:297]

Fornander provides some notes on this lament. The god dwelling at Kapolei is the god Kahahana, stating that this is where his soul has gone. Kamao is one of the names of the door to the underworld. This lament draws an association with wandering souls and the place where the first breadfruit tree was planted by Kahai at Pu'uloa (Fornander 1919, Vol. VI, Part 2:304).

Mary Kawena Pukui offers this Hawaiian saying, which places the wandering souls in a *wiliwili* grove at Kaupe'a.

The wiliwili grove of Kaupe'a	Ka wiliwili of Kaupe'a.

In 'Ewa, O'ahu. Said to be where homeless ghosts wander among the trees.
[Pukui 1983:#1666].

Beckwith (1940:154) has stressed that "the worst fate that could befall a soul was to be abandoned by its '*aumakua* and left to stray, a wandering spirit (*kuewa*) in some barren and desolate place." These wandering spirits were often malicious, so the places that they wandered were avoided.

3.1.2.4 The Plain of Pukaua

The Hawaiian language newspaper *Ka Loea Kālai'āina*, (January 13, 1900) relates that near Pu'uokapolei, on the plain of Pukaua, on the *mauka* side of the road, there was a large rock. This legend suggests that the plain around Pu'uokapolei was called Pukaua. The legend is as follows:

> If a traveler should go by the government road to Waianae, after leaving the village of gold, Honouliuli, he will first come to the plain of Puu-ainako and when that is passed, Ke-one-ae. Then there is a straight climb up to Puu-o-Kapolei and there look seaward from the government road to a small hill, That is Puu-Kapolei. . . . You go down some small inclines, then to a plain. This plain is Pukaua and on the mauka side of the road, you will see a large rock standing on the plain. . . . There were two supernatural old women or rather peculiar women with strange powers and Puukaua belonged to them. While they were down fishing at Kualaka'i [near Barbers Point] in the evening, they caught these things, *'a'ama* crabs, *pipipi* shellfish, and whatever they could get with their hands. As they were returning to the plain from the shore and thinking of getting home while it was yet dark, they failed for they met a one-eyed person [bad omen]. It became light as they came near to the plain, so that passing people were distinguishable. They were still below the road and became frightened lest they be seen by men. They began to run - running, leaping, falling, sprawling, rising up and running on, without a thought of the *'a'ama* crabs and seaweeds that dropped on the way, so long as they would reach the upper side of the road. They did not go far for by then it was broad daylight. One woman said to the other, "Let us hide lest people see us," and so they hid. Their bodies turned into stone and that is one of the famous things on this plain to this day, the stone body. This is the end of these strange women. When one visits the plain, it will do no harm to glance on the upper side of the road and see them standing on the plain [*Ka Loea Kālai'āina*, January 13, 1900, translation in Sterling and Summers 1978:39].

In another version of this story, the two women met Hi'iaka as she journeyed toward the 'Ewa coast. The women were *mo'o* (supernatural beings) and were afraid that Hi'iaka would kill them, so they changed into their lizard form. One of the lizards hid in a little space on a stone beside the coastal trail, and the other hid nearby (*Ka Hōkū o Hawai'i*, February 15, 1927, translated in Maly 1997:19). From that time on the stone was known as *pe'e-kāua*, meaning "we two hidden." Hi'iaka greeted the two women but did not harm them, and passed on.

When she reached Pu'uokapolei, she also greeted two old women who lived at an *'ohai* grove on the hill. These women were named Pu'uokapolei and Nāwaineokama'oma'o (*Ka Hōkū o Hawai'i*, February 22, 1927, translated in Maly 1997:19). As she continued her travels, she looked to the ocean and saw the canoe carrying Lohi'au.

My man on the many harbored sea of Pu'uloa	*Ku'u kāne i ke awa lau o Pu'uloa*
As seen from the plain of Pe'ekāua	*Mai ke kula o Pe'ekāua ke noho*
Let us dwell upon the 'ōhai covered shore	*E noho kāua i ke kaha o ka 'ōhai*
Where the noni blossoms are twisted	*I ka wiliwili i ka pua o ka lau noni*

together	
Descending along Kānehili	*O ka ihona i Kānehili la*
I am winding along	*Ua hili ho'i au-e*

[*Ka Hōkū o Hawai'i*, February 22, 1927, translated in Maly 1997:20].

3.1.2.5 Pu'uokapolei and Kamapua'a

Pu'uokapolei's was the home of Kamapua'a's grandmother, Kamaunuaniho, who was one of the three migrants from Kahiki that were ancestors to the people of O'ahu (Fornander 1919, Vol. V, Part 2:318; Kahiolo 1998:81, 107). Kamapua'a, the Hawaiian pig god, once lived in Kaluanui on the windward side, but escaped to 'Ewa when he was pursued by the chief Olopana.

> Kamapua'a subsequently conquered most of the island of O'ahu, and, installing his grandmother [Kamaunuaniho] as queen, took her to Pu'uokapolei, the lesser of the two hillocks forming the southeastern spur of the Wai'anae Mountain Range, and made her establish her court there. This was to compel the people who were to pay tribute to bring all the necessities of life from a distance, to show his absolute power over all [Nakuina 1904:50-51].

Emma Nakuina goes on to note: "A very short time ago [prior to 1904] the foundations of Kamaunuaniho's house could still be seen at Pu'uokapolei." Another account (*Ka Loea Kālai'āina* January 13, 1900, translated in Sterling and Summers 1978:34) speaks of Kekeleaiku, the older brother of Kamapua'a, who also lived on Pu'uokapolei.

3.1.2.6 The Strife at Honouliuli; Kūali'i unites Hawai'i nei (Mo'olelo o Kūali'i)

The celebrated chief, Kūali'i, is said to have led an army of twelve thousand (*'ekolu mano*) against the chiefs of Ko'olauloa with an army of twelve hundred (*'ekolu lau*) upon the plains of Keahumoa (Fornander 1917, Vol. IV, Part 2:364-401). Perhaps because the odds were so skewed the battle was called off and the *ali'i* of Ko'olau ceded (*ha'awi a'e*) the districts of Ko'olauloa, Ko'olaupoko, Waialua and Wai'anae to Kūali'i. When the *ali'i* of Kaua'i heard of this victory at Honouliuli they gave Kaua'i to Kūali'i as well and thus he became possessed of all the islands (*a lilo a'e la nā moku a pau ia Kūali'i mai Hawai'i a Ni'ihau*). The strife at Honouliuli was the occasion of the recitation of a song for Kūali'i by a certain Kapa'ahulani (*Ka Pule Ana a Kapa'ahulani*). This *mele* compares the king to certain places and objects in the islands, in this instance to the first breadfruit planted by Kahai at Pu'uloa, and a pig and a woman on Pu'u Kapolei, possibly a reference to Kamapua'a and his grandmother.

Not like these art thou, Ku.	*Aole I like Ku.*
Not like the pig	*Aole I like i ka puaa,*
Discerning the progeny of the god;	*I ka weke lao a ke akua,*
[Or] The breadfruit planted by Kahai.	*Ka ulu kanu a Kahai;*
Truly, have you not known	*Oi ole ka oe i ike,*
The woman with the dyed garment,	*Ka wahine pau mao*
On the top of Puuokapolei?	*I ka luna o Puuokapolei-la?*

[Fornander 1917, Vol. IV, Part 2:392-393].

A later section of this *mele* also refers to Pu'uokapolei and makes mention of the famous blue poi of Honouliuli.

O Kawelo! Say, Kawelo!	*O Kawelo-e, e Kawelo-e,*
Kawelokiki, the sharp-pointed hill,	*O Kaweloiki puu oioi,*
Hill of Kapolei.	*Puu of Kapolei-e-*
Blue is the poi which appeases [the hunger] of Honouliuli.	*Uliuli ka poi e piha nei-o Honouliuli;*

[Fornander 1917, Vol. IV, Part 2:400-401].

3.1.3 Pearl Harbor (Pu'uloa) and West Loch (Kaihu o pala'ai)

3.1.3.1 The "Silent Fish" of Pearl Harbor

Pearl Harbor was called Pu'uloa or *ke-awa-lau-o-Pu'uloa*, the many harbored-sea of Pu'uloa (Pukui 1983:#1686) by the Hawaiians. An alternate name was Awawa-lei, or "garland (*lei*) of harbors" (Handy and Handy 1972:469). Pukui (1983:#1126] also uses the name *Awalua* for Pearl Harbor, as in the saying "*Huhui na 'ōpua i Awalau*, The clouds met at Pearl Harbor. Said of the mating of two people." Emerson (1915:167) interprets Awalau as "leaf-shaped lagoon."

John Clark (1977:70) says that its English name came from the name Waimomi, or "water of the pearl," an alternate name for the Pearl River (Pearl Harbor). The harbor was named Pearl Harbor after the pearl oysters of the family Pteriidae (mainly *Pinctada radiata*), which were once abundant on the harbor reefs, but were later decimated by over-harvesting. This oyster was supposedly brought from Kahiki, the Hawaiian ancestral lands, by a *mo'o* (lizard or water spirit) named Kane-kua'ana (Handy and Handy 1972:470).

Kanekua'ana was the *kia'i* (food guardian) for 'Ewa. When food was scarce, the descendants of Kanekua'ana built *waihau heiau* (a *heiau* for *mo'o*) for her and lit fires to plead for her blessings. For 'Ewa, the chief *i'a* (marine food) blessing was the famous *pipi*, or pearl oyster. Samuel Kamakau describes the *pipi* of Honouliuli.

> That was the oyster that came in from deep water to the mussel beds near shore, from the channel entrance of Pu'uloa to the rocks along the edges of the fishponds. They grew right on the *nahawele* mussels and thus was this *i'a* obtained. Not six months after the *hau* branches [that placed a *kapu* on these waters until the *pipi* should come up] were set up, the *pipi* were found in abundance-enough for all 'Ewa-and fat with flesh. Within the oyster was a jewel (*daimana*) called a pearl (*momi*), beautiful as the eyeball of a fish, white and shining; white as the cuttle fish, and shining with the colors of the rainbow-reds and yellow and blues, and some pinkish white, ranging in size from small to large. They were of great bargaining value (*he waiwai kumuku'ai nui*) in the ancient days, but were just "rubbish" ('*opala*) in 'Ewa [Kamakau 1991a:83].

This oyster, the *pipi*, was sometimes called "the silent fish," or *i'a hamau leo o 'Ewa*, 'Ewa's silent sea creature (Handy and Handy 1972:471), since the collectors were supposed to stay quiet while harvesting the shells, as in the sayings:

The fish of 'Ewa that silences the voice. *Ka ka'a hāmau leo o 'Ewa.*
The pearl oyster, which has to be gathered in silence [Pukui 1983:#1331].

'Ewa is disturbed by the Moa'e wind. *Haunāele 'Ewa i ka Moa'e.*
Used about something disturbing, like a violet argument. When the people of 'Ewa went to gather the *pipi* (pearl oyster), they did so in silence, for if they spoke, a Moa'e breeze would suddenly blow across the water, rippling it, and the oysters would disappear [Pukui 1983:5#493].

Hush, lest the wind rise. *E hāmau o makani mai auane'i.*
Hold your silence or trouble will come to us. When the people went to gather pearl oysters at Pu'uloa, they did so in silence, for they believed that if they spoke, a gust of wind would ripple the water and the oysters would vanish [Pukui 1983:#274].

The gesturing fish of 'Ewa. *Ka i'a kuhi lima o 'Ewa.*
The *pipi*, or pearl oyster. Fishermen did not speak when fishing for them but gestured to each other like deaf-mutes [Pukui 1983:#1357].

Sereno Bishop, an early resident of O'ahu, wrote, of his time in the area around 1836, of the pearl oyster, the *pipi*, and another edible clam, identified by Margaret Titcomb (1979:351) as probably *Lioconcha heiroglyphica.*

> The lochs or lagoons of Pearl River were not then as shoal as now. The subsequent occupation of the uplands by cattle denuded the country of herbage, and caused vast quantities of earth to be washed down by storms into the lagoons, shoaling the water for a long distance seaward. No doubt the area of deepwater and anchorage has been greatly diminished. In the thirties, the small oyster was quite abundant, and common on our table. Small pearls were frequently found in them. No doubt the copious inflow of fresh water favored their presence. I think they have become almost entire extinct, drowned out by the mud. There was also at Pearl River a handsome speckled clam, of a delicate flavor which contained milk white pearls of exquisite luster and perfectly spherical. I think the clam is still found in the Ewa Lochs [Bishop 1901:87].

Older Hawaiians believed that the *pipi* disappeared around the time of the smallpox epidemic of 1850-1853, because Kanekua'ana became displeased at the greed of some *konohiki* (overseer).

> The people of the place believe that the lizard was angry because the konohikis imposed kapus [bans], were cross with the women and seized their catch of oysters. So this "fish" was removed to Tahiti and other lands. When it vanished a white, toothed thing grew everywhere in the sea, of Ewa, which the natives of Ewa had named the pahikaua (sword). It is sharp edged and had come from Kauai-helanai, according to this legend [Manu 1885:50].

Pahikaua is the Hawaiian name for the mussel, *Brachidontes crebristriatus* (Mytilidae), which was also a popular clam eaten by the residents of Pearl Harbor.

A clarification of the story of Kanekua'ana and the pearl oysters of Pearl Harbor is given, in which it seems an overseer had set a ban on the *pipi* for several months a year so that they could increase. A poor widow, a relation of the *mo'o*, took some of the *pipi* and hid them in a basket. The *konohiki* found the hidden shells, and took them from her, emptying them back into the sea, which was proper. However, after this he followed the woman home and also demanded that she pay a stiff fine in cash, which she did not have. The *mo'o* thought this was unjust and the next night she took possession of a neighbor who was a medium.

> . . . After the overseer had gone back to Palea the lizard goddess possessed her aged keeper [a woman of 'Ewa] and said to those in the house, "I am taking the pipi back to Kahiki and they will not return until all the descendants of this man are dead. I go to sleep. Do not awaken my medium until she wakes of her own accord." The command was obeyed and she slept four days and four nights before she awoke. During the time that she slept the pearl oysters vanished from the places where they were found in great numbers, as far as the shore . . . .The few found today are merely nothing . . . [*Ka Loea Kālai'āina*, June 3, 1899, translation in Sterling and Summers 1978:49-50].

3.1.3.2 Kāne and Kanalao and the Fish Ponds of West Loch

According to an account in the Hawaiian newspaper *Ka Loea Kālai'āina* (June 10, 1899), several of the fishponds in the Pu'uloa area were made by the brother gods, Kāne and Kanaloa. A fisherman living in Pu'uloa, named Hanakahi, prayed to unknown gods, until one day two men came to his house. They revealed to him that they were the gods to whom he should pray. Kāne and Kanaloa then built fishponds at Ke'ana-pua'a, but were not satisfied. Then they built the fishpond, Kepo'okala, but were still not satisfied. Finally they made the pond Kapākule, which they stocked with all manner of fish. They gifted all of these fishponds to Hanakahi and his descendants (Handy and Handy 1972:473; *Ka Loea Kālai'āina*, July 8, 1899).

According to Mary Pukui (1943:56-57), who visited Kapākule fishpond when she was young, the pond was built by the legendary little people of Hawai'i, the *menehune*, under the direction of the gods Kāne and Kanaloa. The fishpond contained many fish, especially the *akule* (scad fish, *Trachurops crumenophthalmus*), thus its name, "the enclosure for *akule* fish" (Pukui 1943:56-57). Pukui describes several unique aspects of this pond:

> On the left side of the pond stood the stone called Hina, which represented a goddess of the sea by that by that name. Each time the sea ebbed, the rock became gradually visible, vanishing again under water at high tide. Ku, another stone on the right, was never seen above sea level. This stone represented Ku'ula, Red Ku, a god for fish and fishermen. From one side of the pond a long wall composed of driven stakes of hard wood, ran toward the island [Laulaunui] in the lochs. When the fish swam up the channel and then inside of this wall, they invariably found themselves in the pond. A short distance from the spot where the pond touched the shore was a small koa or altar composed of coral rock. It was here that the first fish caught in the pond was laid as an offering to the gods [Pukui 1943:56].

The pond was destroyed when the channel to Pearl Harbor was dredged in the early twentieth century. The caretaker of the pond took the stones Kū and Hina to a deep place in the ocean and sunk them so "none would harm or defile them." Cobb (1903:733) says it was used to catch the larger *akule* (goggler), *opelu* (mackeral scad), *weke* (goat fish), *kawakawa* (bonito), and sharks; it was unusual for having walls made of coral. This contradicts much of the legendary material that says that sharks were not killed within Pearl Harbor; however, Kamakau does relate that Kekuamanoha and Kauhiwawaeono, two conspirators against Kamehameha I, lived at Pu'uloa. The chief Kauhiwawaeono was known to murder people and use their bodies as shark bait (Kamakau 1961:182, 232).

Samuel Kamakau adds more information on the pond Kapākule, and a second one called Kepo'okala.

> At Pu'uloa on Oahu were two unusual ponds [fish traps]—Kapakule and Kepoolala. Kapakule was the better one. The rocks of its walls, *kuapa*, could be seen protruding at high tide, but the interlocking stone walls (*pae niho pohaku*) of the other pond were still under water at high tide. . . . It [Kapakule] was said to have been built by the *'e'epa* people [mysterious people] at the command of Kane ma [ma=and others, company] . . .
>
> This is how the fish entered the pond. At high tide many fish would go past the mauka side of the pond, and when they returned they would become frightened by the projecting shadows of the trunks, and would go into the opening. The fish that went along the edge of the sand reached the seaward wall, then turned back toward the middle and entered the *anapuna* (the arched portion of the trap) A man ran out and placed a "cut-off" seine net (*'omuku lau*) in the opening, and the fish shoved and crowded into it. The fish that were caught in the net were dumped out, and those not caught in the net were attacked with sharp sticks and tossed out, or were seized by those who were strong [Kamakau 1976:88].

3.1.3.3 The Story of Kaihuopala'ai Pond, Honouliuli (Ka'ao no Maikohā)

In the Legend of Maikohā (Fornander 1917, Vol. V, Part 2:270-271), a sister of Maikohā, a deified hairy man who became the god of *tapa* makers, named Kaihuopala'ai, journeys to O'ahu:

> Kaihuopala'ai saw a goodly man by the name of Kapapaapuhi who was living at Honouliuli, 'Ewa; she fell in love with him and they were united, so Kaihuopala'ai has remained in 'Ewa to this day. She was changed into that fishpond in which mullet are kept and fattened, and that fish pond is used for that purpose to this day
>
> *'Ike aku la o Kaihuopala'ai i ka maikai o Kapapaapuhi, he kāne e noho ana ma Honouliuli ma 'Ewa. Moe iho la lāua, a noho iho la o Kaihuopala'ai i laila a hiki i kēia lā. 'Oia kēlā loko kai e ho'opuni ia nei i ka 'anae, nona nā i'a he nui loa, a hiki i kēia kākau ana* [Fornander 1919, Vol. V, Part 2:270].

The name of Maikohā's sister, Kaihuopala'ai, which means "the nose of Pala'ai" (Pukui et al. 1974:68) is also the name the Hawaiians used for the west loch of Pearl Harbor, adjacent to the current study area. McAllister recorded that other Hawaiians say there never was a fishpond by that name. Beckwith (1918) says that Kaihuopala'ai changed into the fishpond near Kapapapuhi Point, which means "the eel flats." This is identified on old maps as the point northeast of the current study area (sometimes called Kapapa'apuhi, Papapuhi, or Hō'ae'ae Point) that juts into the loch; early Hawaiian settlement was focused on this area.

There is also a famous *pōhaku*, or rock, associated with the traveling mullet of Pearl Harbor.

> . . . I . . . asked the person sitting on my left, "What place is this?" Answer – "This is Pearl City." It was here that mullets were bred in the ancient times and that flat stone there was called Mullet Rock or Pōhaku Anae. It lies near the beach by Ewa mill [*Ka Nūpepa Kū'oko'a*, Oct. 2, 1908, from Sterling and Summers 1978:53].

3.1.3.4 The Traveling Mullet of Honouliuli (Fish Stories and Superstitions)

The story of Kaihuopala'ai, or Ihuopala'ai, is also associated with the tradition of the *anae-holo,* the traveling mullet of Pearl Harbor (Thrum 1998:270-272):

> The home of the '*anae-holo* is at Honouliuli, Pearl Harbor, at a place called Ihuopala'ai. They make periodical journeys around to the opposite side of the island, starting from Pu'uloa and going to windward, passing successively Kumumanu, Kalihi, Kou, Kālia, Waikīkī, Ka'alāwai, and so on, around to the Ko'olau side, ending at Lā'ie, and then returning by the same course to their starting point [Thrum 1998:271].

In Thrum's account, Ihuopala'ai is a male who possesses a Kū'ula or fish god that supplied the large mullet known as "*anae*." His sister lived in Lā'ie, and there came a time when there were no fish to be had. She sent her husband to visit Ihuopala'ai, who was kind enough to send the fish following his brother-in-law on his trip back to Lā'ie.

This story is associated with a proverb or poetical saying identified with Honouliuli:

> The fish fetched by the wind. *Ka I'a hali a ka makani*
> The '*anaeholo*, a fish that travels from Honouliuli, where it breeds, to Kaipāpa'u, on the windward side of O'ahu. It then turns about and returns to its original home. It is driven closer to shore when the wind is strong [Pukui 1983:#1330].

Pukui et al. (1974:68) gives the name of the husband in this story as Lā'ie and the name of the wife as Pala'ai, which ties into the name of the west loch of Pearl Harbor, called Ka-ihu o Pala'ai, "the nose of Pala'ai." Another version has a woman named Awawalei (an alternate version for the name of Pearl Harbor), who had a brother named Laniloa (the point on Lā'ie at which the mullet stops its migration and makes its way back to Pearl Harbor), and another brother (a mullet) who lived with an eel named Papa-puhi, which relates to the name of the fishpond in the tale called Kapapapuhi (*Ka Loea Kālai'āina*, Oct. 21, 1899). On historic maps,

Kapapapuhi is a point of land that juts into West Loch and was a focus for habitation, taro cultivation, and fishpond maintenance in the early post-Contact (and probably earlier) period.

3.1.3.5 The Caves of Pu'uloa

'Ewa was famous for the many limestone caves formed in the uplifted coral. Some of these caves, called *ka-lua-ōlohe* were inhabited by the *ōlohe*, a type of people that looked like other humans but had tails like dogs (Beckwith 1940:343). These people were skilled in wrestling and bone-breaking and often hid along narrow passes to rob travelers; they were also reputed to be cannibals. The famous cannibal king, Kaupe, who lived in Līhu'e in upland Honouliuli, was an *ōlohe*.

There was once a cave named Kapuna on Waipi'o peninsula that was associated with a famous riddle. *No Kapuna kane hale noho ia e ke kai*, or "To Kapuna belongs the house, the sea dwells in it."

> This cave is on the Waipio side and a sea passage separates Waipio and Waikele and Waikele and Honouliuli. The passage is obstructed by three small islands, a middle one and Manana and Laulaunui. These small islands in the middle of the passage to Honouliuli and inside and outside of these small islands is the sea of Kaihuopalaai [Hawaiian name for West Loch] where mullet lived till they whitened with age [*Ka Loea Kālai'āina*, Oct. 7, 1899, translation in Sterling and Summers 1978:24].

Another famous cave of the area was Keanapua'a [in Halawa opposite Waipi'o peninsula], which means "the pig's cave," so named because Kamapua'a once slept there (Pukui et al. 1974:103). This cave was one of the places where the high king of O'ahu, Kahahana, hid after he had killed the priest Kaopulupulu, thus angering the high chief of Maui, Kahekili (Kahahana's father).

> Upon the arrival here at Oahu of Kahekili, Kahahana fled, with his wife Kekuapoi, and friend Alapai, and hid in the shrubbery of the hills. They went to Aliomanu, Moanalua, to a place called Kinimakalehua; then moved along to Keanapuaa and Kepookala, at the lochs of Puuloa, and then from there to upper Waipio; thence to Wahiawa, Helemano, and on to Lihue; thence they came to Poohilo, at Honouliuli, where they first showed themselves to the people and submitted themselves to their care.
>
> Through treachery, Kahahana was induced to leave Po'ohilo, Honouliuli and was killed on the plains of Hoaeae [Thrum 1906:213-214].

The place Pō'ohilo was somewhere on the border between Honouliuli and Hō'ae'ae (north of the current study area). In the "Legend of the Sacred Spear-point" (Kalākaua 1990:209-225) is a reference to the Hawai'i Island chief, Hilo-a-Lakapu. Following his unsuccessful raid against O'ahu "he was slain at Waimano, and his head was placed upon a pole near Honouliuli for the birds to feed upon"(Kalākaua 1990:224). This place was called Pō'o Hilo, which literally means "the head of Hilo."

The caves of Pu'uloa were sometimes used as burial caves. In 1849, Keali'iahonui, son of Kaua'i's last king, Kaumuali'i, died. He had once been married to the chiefess Kekau'ōnohi, who had stayed with him until 1849. She wanted to bury her ex-husband at sea.

> It seems that by Kekauonohi's orders, the coffin containing her late husband's remains was removed to Puuloa, Ewa, with the view of having it afterwards taken out to sea and there sunk. It was temporarily deposited in a cavern in the coral limestone back of Puuloa, which has long been used for a burial place, and has lately been closed up [Alexander 1907:27].

After some initial objections by the niece of Kealai'iahonui, the body was removed from the outer coffin, the rest was sunk, and the coffin was later buried somewhere in Pu'uloa.

3.2 Historic Background

3.2.1 Pre-Contact and Early Post-Contact Periods

By ca. A.D. 1320, 'Ewa, along with Kona, and Ko'olaupoko were the dominant polities, ruled by the sons of a chief named Māweke (Cordy 2002:21). 'Ewa at this time included the traditional districts of 'Ewa, Wai'anae, and Waialua (Fornander 1880:48). Around A.D. 1400, the entire island was ruled by King La'akona; chiefs within his line, the Māweke-Kumuhonua line, reigned until about A.D. 1520-1540, with their major royal center in Līhu'e, in 'Ewa. (Cordy 2002:24). Haka was the last chief of the Māweke-Kumuhonua line; he was slain by his men at the fortress of Waewae near Līhu'e (Kamakau 1991b:54-54; Fornander 1880:88). Power shifted between the chiefs of different districts from the 1500s until the early 1700s, when Kūali'i achieved control of all of O'ahu by defeating the Kona chiefs, then the 'Ewa chiefs, and then expanding his control on windward Kaua'i. Peleiholani, the heir of Kūali'i, gained control of O'ahu ca. 1740, and later conquered parts of Moloka'i. He was ruler of O'ahu until his death in ca. 1778 when Kahahana, of the 'Ewa line of chiefs was selected as the ruler of O'ahu (Cordy 2002:24-41).

After Kamehameha's O'ahu victory, he gave the *ahupua'a* of Honouliuli to Kalanimōkū as part of the *panalā'au*, or conquered lands, with the right to pass the land on to his heirs rather than having it revert to Kamehameha (Kame'eleihiwa 1992:58, 112). Kalanimōkū subsequently gave the *ahupua'a* to his sister, Wahinepi'o.

Various Hawaiian legends and early historical accounts indicate that the *ahupua'a* (land division) of Honouliuli was once widely inhabited by pre-Contact populations, including the Hawaiian *ali'i* (chiefly class). This would be attributable for the most part to the plentiful marine and estuarine resources available at the coast, along which several sites interpreted as permanent habitations and fishing shrines have been located. Other attractive subsistence-related features of the *ahupua'a* include irrigated lowlands suitable for wetland taro cultivation, as well as the lower forest area of the mountain slopes for the procurement of forest resources. Handy and Handy (1972:429) report:

> The lowlands, bisected by ample streams, were ideal terrain for the cultivation of irrigated taro. The hinterland consisted of deep valleys running far back into the

> Ko'olau range. Between the valleys were ridges, with steep sides, but a very gradual increase of altitude. The lower part of the valley sides were excellent for the cultivation of yams and bananas. Farther inland grew the 'awa for which the area was famous.

In addition, breadfruit, coconuts, *wauke* (paper mulberry; *Broussonetia papyrifera*), bananas, and *olona* (*Touchardia latifolia*) and other plants were grown in the interior. 'Ewa was known as one of the best areas to grow gourds and was famous for its *mamaki*. It was also famous for a rare taro called the *kai o 'Ewa*, which was grown in mounds in marshy locations (Handy and Handy 1972:471). The cultivation of this prized and delicious taro led to the saying:

> He has eaten the Kāī-koi taro of 'Ewa. *Ua 'ai i ke kāī-koi o 'Ewa.*
> Kāī is O'ahu's best eating taro; one who has eaten it will always like it. Said of a youth of a maiden of 'Ewa, who, like the Kāī taro, is not easily forgotten [Pukui 1983:#2770].

The lochs of Pearl Harbor were ideal for the construction fishponds and fishtraps. Forest resources along the slopes of the Wai'anae Range probably acted as a viable subsistence alternative during times of famine and/or low rainfall (Handy 1940:211; Handy and Handy 1972:469-470). The upper valley slopes may have also been a resource for sporadic quarrying of basalt used in the manufacturing of stone tools. At least one probable quarrying site (SIHP site 50-80-12-4322) is present in Maka'īwa Gulch at 152 m (500 ft) above mean sea level (Hammatt, Robins, et al. 1990).

John Papa 'Ī'ī described a network of Leeward O'ahu trails (Figure 10), which in historic times encircled and crossed the Wai'anae Range, allowing passage from Lualualei to Honouliuli by three different trails ('Ī'ī 1959:96-98). The coastal trail skirted Pearl Harbor, passing by Pu'uokapolei; this would have been the nearest of three Honouliuli trails to the current project area. Following 'Ī'ī's description, a portion of the coastal trail would have passed close to the existing Farrington Highway, near the northern border of the project area, as seen in an 1825 map (Figure 11) map of the south coast of O'ahu by Charles Malden of the British ship the *Blonde*.

The trail is described by 'Ī'ī as:

> The trail went down to the stream and up again, then went above the taro patches of Waiau, up to a *makai* field, to Waimano, to Manana, and to Waiawa; then to the stream of Kukehi and up to two other *maika* fields, Pueohulunui and Haupuu. At Pueohulunui was the place where a trail branched off to go toWaialua and down to Honouliuli and on to Waianae. As mentioned before, there were three trails to Waianae, one by way of Pu'u o Kapolei, another by way of Pohakea, and the third by way of Kolekole ['Ī'ī 1959:97].

Early historical accounts of the general region typically refer to the more populated areas of the 'Ewa district, where missions and schools were established and subsistence resources were perceived to be greater. However, the presence of archaeological sites along the barren coral plains and coast of southwest Honouliuli Ahupua'a, indicate that prehistoric and early historic populations also adapted to less inviting areas, despite the environmental hardships.

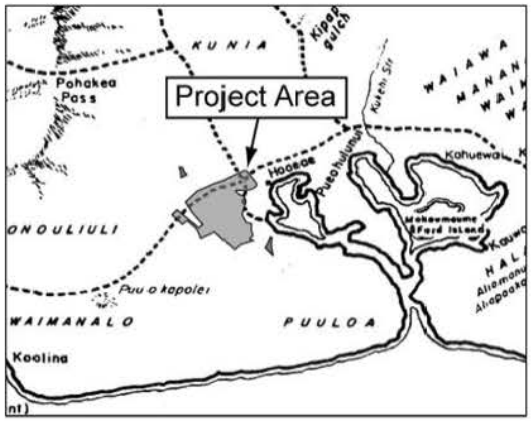

Figure 10. Trails (dashed lines) of Leeward Oahu. Map by Paul Rockwood. ('Ī'ī 1959:96) Mid- to late-1800s

3.2.2 Observations of Early Explorers and Foreign Residents

Captain Vancouver sailed by Kalaeloa (Barbers Point) in 1792, and recorded his impression of the small coastal village of Kualaka'i and the arid Honouliuli coast.

> The point is low flat land, with a reef round it . . . Not far from the S.W. point is a small grove of shabby cocoa-nut trees, and along these shores are a few struggling fishermen's huts [Vancouver 1798, Vol. I:167].

> . . . from the commencement of the high land to the westward of Opooroah [Pu'uloa], was composed of one very barren rocky waste, nearly destitute of verdure, cultivation or inhabitants, with little variation all the way to the west point of the island . . . [Vancouver 1798, Vol. II:217].

> . . . This tract of land was of some extent but did not seem to be populous, nor to possess any great degree of fertility; although we were told that at a little distance from the sea, the soil is rich, and all necessaries of life are abundantly produced . . . [Vancouver 1798, Vol. III:361-363].

Archibald Campbell, an English seamen who was given some land in Waimano Ahupua'a by King Kamehameha in 1809, described his land around Pearl Harbor:

> In the month of November the king was pleased to grant me about sixty acres of land, situated upon the Wymummee [traditional Hawaiian name for Pearl River], or Pearl-water, an inlet of the sea about twelve miles to the west of Hanaroora

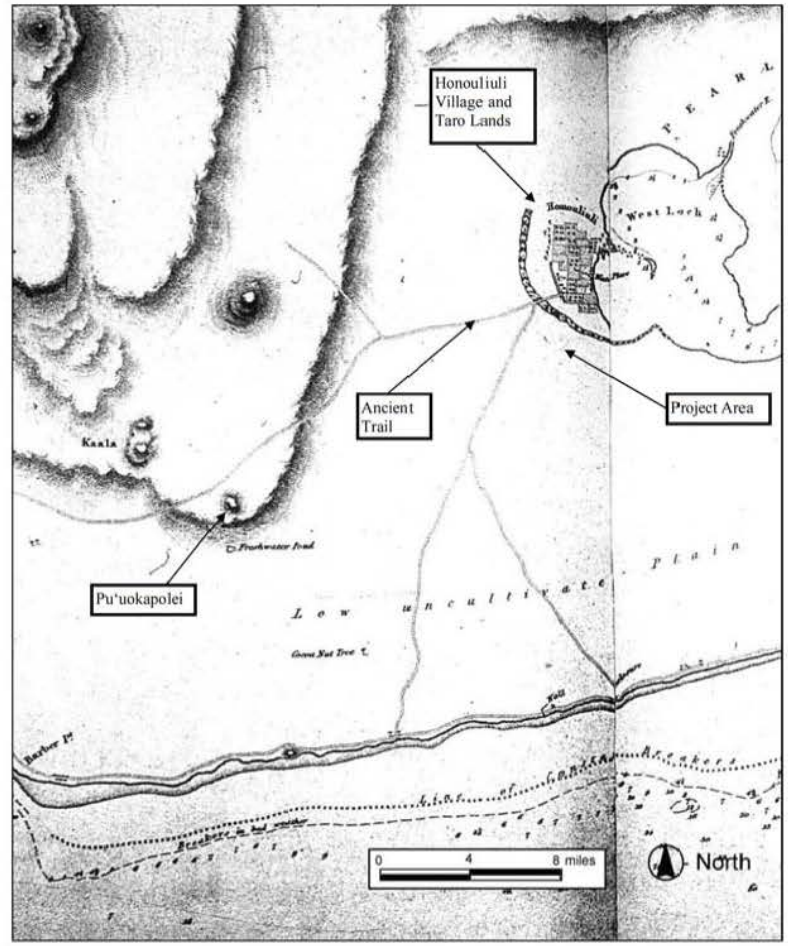

Figure 11. Portion of 1825 Map of the South Coast of Woahoo (O'ahu) and Honolulu by Lieut. C.R. Malden from the British ship the *Blonde*

> [Honolulu]. . . . We passed by footpaths, winding through an extensive and fertile plain, the whole of which is in the highest state of cultivation. Every stream was carefully embanked, to supply water for the taro beds. Where there was not water, the land was under crops of yams and sweet potatoes [Campbell 1967:103-104].

Pearl and mother of-pearl shells are found here in considerable quantity. Since the king has learned of their value, he has kept the fishing to himself, and employs divers for the purpose [Campbell 1967:114-115].

Subsequent to western contact in the area, the landscape of the 'Ewa plains and Wai'anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals, including goats, sheep and cattle, were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were brought to O'ahu; however, L.A. Henke reports the existence of a longhorn cattle ranch in Wai'anae by at least 1840 (Frierson 1972:10). During this same time, perhaps as early as 1790, exotic vegetation species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the logging of sandalwood forest and eroded by animal grazing. Within the current project area, the majority of the (non-cultivated) vegetation is comprised of introduced species, mainly grasses.

At contact, the most populous *ahupua'a* on the island was Honouliuli, with the majority of the population centered on Pearl Harbor. In 1832, a missionary census of Honouliuli recorded the population as 1,026. Within four years the population was down to 870 (Schmitt 1973:19, 22). In 1835, there were eight to ten deaths for every birth (Kelly 1991:157-158). Between 1848 and 1853, there was a series of epidemics of measles, influenza, and whooping cough that often wiped out whole villages. In 1853, the population of 'Ewa and Wai'anae combined was 2,451 people. In 1872, it was 1,671 (Schmitt 1968:71). The inland area of 'Ewa was probably abandoned by the mid-nineteenth century, due to population decline and consolidation of the remaining people in the town of Honouliuli (at Kapapapuhi Point, northeast of the project area). A detailed discussion of the historic population counts in the 'Ewa District has been presented by Charvet-Pond and Davis (1992).

The first mission station in 'Ewa was established in 1834 at Kalua'aha near Pearl Harbor. Charles Wilkes, of the U.S. Exploring Expedition visited the missionary enclave at Honouliuli town in 1840.

> At Ewa, Mr. Bishop has a large congregation. The village comprises about fifty houses, and the country around is dotted with them. . . . The natives have made some advance in the arts of civilized life; there is a sugar-mill which, in the season, makes two hundred pounds of sugar a day. . . . In 1840, the church contained nine hundred members, seven hundred and sixty of whom belonged to Ewa, the remainder to Waianae; but the Catholics have now established themselves at both these places, and it is understood are drawing off many from their attendance on Mr. Bishop's church [Wilkes 1970:80-81].

The earliest (1873) detailed map of the area (Figure 12) shows no habitation closer than the western edge of West Loch in the vicinity of Kapapapuhi Point. A Monsarrat survey map

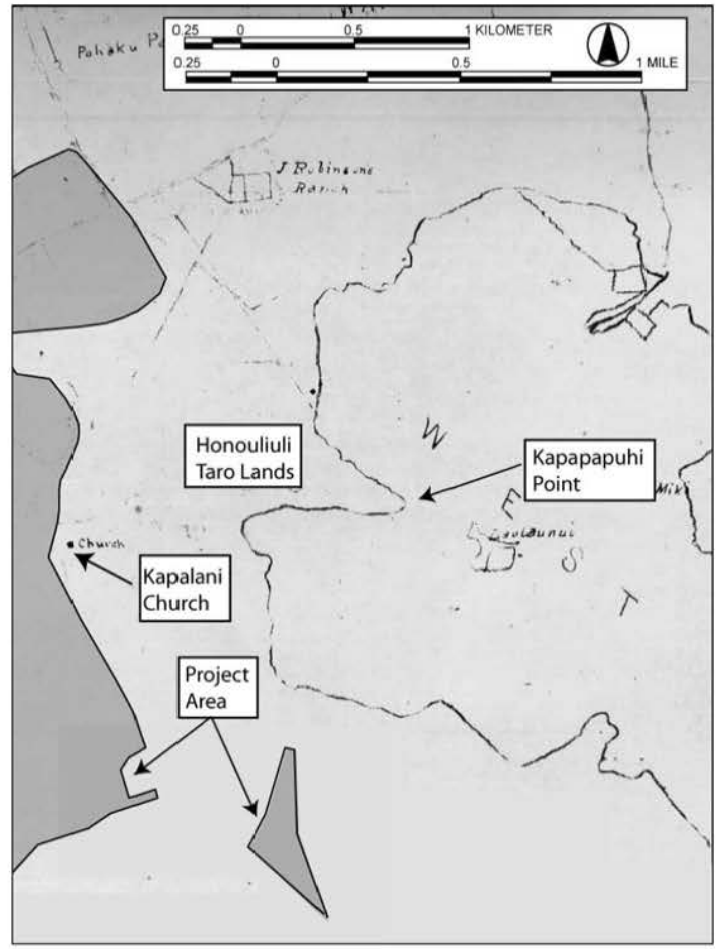

Figure 12. Portion of 1873 W.D. Alexander map of Honouliuli, showing location of Kapapapuhi Point (habitation symbols are illegible); also note location of Kapalani Catholic Church

of 1878 (Figuere 13) documents substantial settlement at the "Honouliuli Taro Land" in the Kapapapuhi Point area, and it seems clear that in early historic times, this was the focus of the population of Honouliuli. The amenities of the area - including fishponds, taro *lo'i*, abundant shellfish, and salt pans - would have focused population there in pre-Contact times as well.

3.2.3 Mid-Nineteenth Century and the Māhele

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* (chiefly class) received their land titles. The common people received their *kuleana* (individual parcels) in 1850.

During the *Māhele* of 1848, 72 individual land claims in the *ahupua'a* of Honouliuli were registered and awarded by King Kamehameha III (Tuggle and Tomonari-Tuggle 1997a:34). The 72 *kuleana* awards, awards given to commoners, were almost all made adjacent to Honouliuli Gulch, which contained fishponds and irrigated taro fields. Kepa Maly (1997, Table 3: 38-42) provides a table recording information on each award, including awardee, *'ili*, and land use of the *'āpana* (lot). A summary of the information on houses, fields, and boundary landmarks noted for each *'ili* is given Table 2 below and *'ili* locations are shown on Figure 13.

3.2.4 Project Area Māhele Awards

A comparison of project area maps with an 1878 map surveyed by M. D. Monsarrat) clearly show that all or portions of certain land claims belonging to Kelia (LCA 763), Pue (LCA 869), Leleiupa (LCA 1699) and Kua (LCA 5653) lie within the project area (Figure 14). These LCAs were once located on the east side of the main road along Honouliuli town, but now portions lay west of the current alignment of Old Fort Weaver Road. A brief review of the four known LCAs within the project area follows (see Figure 14 for *'ili* locations):

Kelia's *'Āpana* 1 (LCA 763)

Kelia's claimed this land situated in the *'ili* of Poohilo and Uani for his houses. His witnesses agreed with his claim, but there was a dispute over whether there were 3 or 4 houses within the parcel. All agreed Kelia has one house there and that his father, Pueeu had two. The west or Wai'anae boundary was described variously as the "*pali* of Makaaku," "a ravine" or "a cliff." The claimant received his house lot from his father Pueeu and "has accepted it ever since 1836."

Pue *'Āpana* 1 and *'Āpana* 2 (LCA 869)

Pue claimed four parcels in the *'ili* of Maui at Honouliuli, 'Ewa. One parcel was a houselot and had two houses on it, one for himself and one for Puali who was his father-in-law. The western side was bounded by the land of Koi, the *luna* (overseer), who gave Pue's family their land in 1842. The other parcel within the project area was *kula*, pasture land to the east of the houselot.

Table 2. Summary of land use and boundary landmarks recorded in Honouliuli LCA awards (see Figure 13 for *'ili* locations)

'Ili	Land Use and Boundary Landmarks
Hiwalalo	*kou* trees
Ka'aumakua	houselots, *kalo* (taro) patches; *kula* (pasture/dryland agriculture), two fishponds called Mokumeha; *kula ālialia* (salt plains), land division wall, Pānāhāhā *loko* (fishpond), Kalahu fishpond, Naholowaa pond, Honouliuli Stream (called Makai'i Stream), or *'aka'akai* (bulrushes) of Kamo'okahi
Kaihuopala'ai	*mo'i* (arable land in a long strip); on lot bounded by *'auwai* (irrigation ditch) called Panaenui
Ka'ilikahi	houselot and *kalo* patches; landmarks – highway, Kauhipuna cliff, *lapalapa* (*panax*) thickets, meeting house
Kamilomilo	houselot and *kalo* patches
Kamoku	fenced *mo'o kalo*, *lo'i* (irrigated fields) *kalo*, houselot; landmarks – Kauhipuna pali
Kamo'okahi	bulrushes
Kapāpahi	houselots, *kalo* patches; bounded by ponds of Healani
Kapapapūhi	houselots, vineyard, *kula*, pond, trails, hog pens, and salt beds
Ka'ula'ula	*mo'o* next to Kaulaula (cliff) with a houselot and a wall
Loloulu	*kalo* patches, 1/3 of a fishpond (in land of Kahakuli'ili'i), hala grove, pig pens, breadfruit, bulrushes
Maka'u	houselot and *kalo* patches
Maui	*kalo* patches, *kula*, houselots, bounded by *pa'aina a ke Aupini* (land division wall of the government)
Mokumeha	2 fishponds, salt beds (western one called Kohumakahou)
Niuke'e	*kalo* patches, *kula*, potato field, houselots; landmarks - *loko kalo* (taro/ fishpond) of Nihola, Loko'eli pond, Kehewanakawalu pond, Kalokoiki pond, *pali* of Kihewamakawela; Ka'akau *pali*; Ka'akau community, meeting house, prison plot, cattle fences
Polapola	*kalo* patches; houselots, school house, prison plot; some bounded by *pā'āina a ke Aupīni*, or high road from the sea, or Catholic Chapel yard
Pō'ohilo	*kula*, *kalo* patches, *loko kalo*, houselots; landmarks - *pā'āina*, Ka'aimanō fishpond, *kula* of Kahakai, *loko kalo* of Kalokoloa, Aimea Pond, Waianu pond, Kahui pond, Ka'aimano fishpond, *pupulu* cave (wet cave?), prison plot, Makaakua pali, Puehuehu Stream, Puehuehu road
Pua'alu'u	*lo'i*, houselot
Pu'uloa	houselots; boundaries include the sea, a *kula* called Waioipu, and the plain of Kaluanohu

Figure 13. 1878 Map of Honouliuli Taro Lands (LCAs) by M.D. Monsarrat, with inserted '*ili* names; project area is to the west of this map

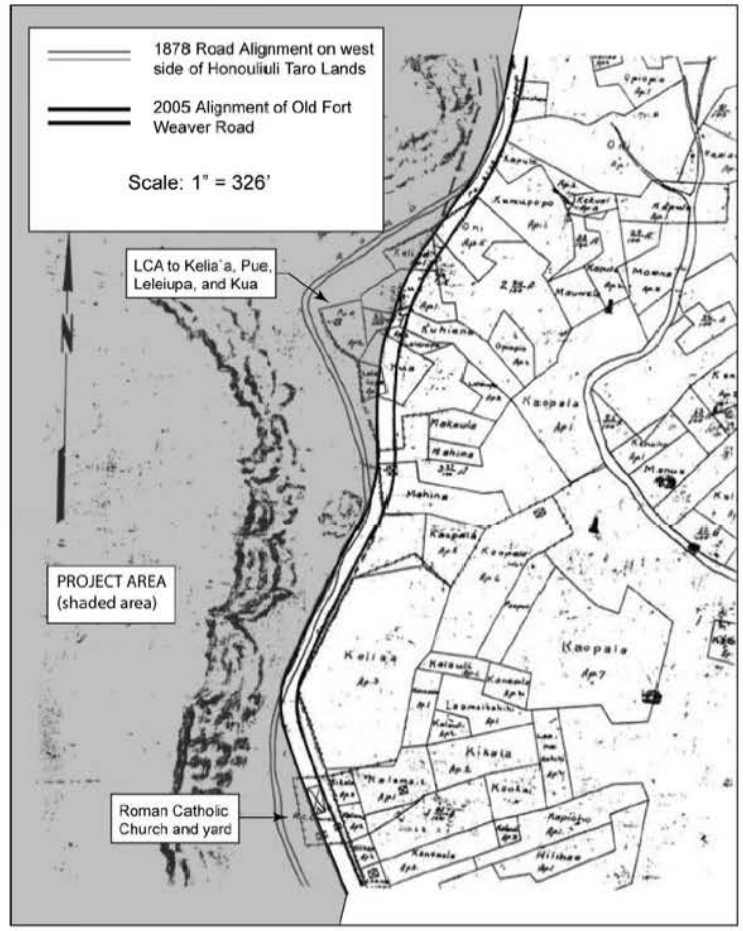

Figure 14. Portion of 1878 Monsarrat map, showing portion of Honouliuli Taro Lands in relation to current alignment of Old Fort Weaver Road (eastern boundary of the project area)

Leleiupa *'Āpana* 1 and *'Āpana* 2 (LCA 1699)

Leleiupa 'Āpana 1 and 2 were claims for two parcels situated in the *'ili* of Maui. 'Āpana 1 was bordered on the west by the land of Koi, the overseer.

Kua (LCA 5623)

Kua claimed two taro patches and a *kula* land called Kahui in the *'ili* of Maui. Of note was the sworn testimony of Maakuia on the Land Court Application for Mahina (LCA 749), which stated that the western boundary of Mahina's land was [Kaulaula] Pali, which had a wall on its top.

3.2.5 The Catholic Church

A portion of the former site of a Catholic church, called Kapalani Catholic Church, also now lies on the west side of the current road alignment, although the church itself was probably covered by the new road itself. This church and associated schoolhouse is believed to have been the site of the ministry of a particularly notable person, Kepelino Keauokalani.

There are two land applications that make reference to a Catholic Church near the town of Honouliuli. Kaohai in April of 1850 (LCA 5670B) claimed a house site in the *'ili* of Polapola "adjoining the Catholic Chapel yard." Hilinae (LCA 1720) in November of 1847 made a houselot claim in the *'ili* of Polapola bounded on the west by the Kapalani Church. Little is known about the Kapalani Roman Catholic Church. It is clearly annotated on Monsarrat's 1878 map (see Figure 14) and is the lone "church" pictured on an 1881 map of the Honouliuli district (Figure 15). Even the name is uncertain, as Kapalani probably means "the Frenchmen's" church. Efforts to found a Catholic Mission in Hawai'i were initially met with hostility until the issuing of an edict of toleration in 1839. The establishment of the Catholic Mission in Hawai'i in May of 1849 initiated an active period of building churches and schools. The Kapalani church (and school house) cited in the Land Court Application of Hilinae in November of 1847 must have been constructed within the previous seven years. Father Raymond Delande was pastor of the Leeward District of the church from 1857-1885 and, operating out of Honouliuli, he covered an area extending as far as Makaha and Waialua. "Up to 1877, he had baptized 600 children and adults, all living along the SW coast of Oahu" (Schoofs 1978:110).

Of particular interest is the association with this church of Kahoali'ikumaieiwakamoku Kepelino (Zepherino) Keauokalani, whose name means "to-be-the-chief-of-the-nine-districts" (Beckwith 1978:4). His father was Namiki, of the lineage of the high priest Pa'ao and his mother, Kahiwa Kaneikopulei, was a daughter of Kamehameha I. They had two children, the son Kepelino, and a daughter named Puahau. Namiki was the "old savage" whose narratives were collected by Jules Remy as "Contributions of a Venerable Savage to the Ancient History of the Hawaiian Islands" during his travels in the islands between 1851 and 1855. In a note on a section concerning the priest Pā'ao, the author talks about Namiki's son, who he met in 1853.

> The old historian Namiki, an intelligent man, and well versed in the secrets of Hawaiian antiquity, has left precious unedited documents, which have fallen into our hands. His son, Kuikauai, a school-master at Kailua, one of the true historico-sacerdotal race, has given us a genealogy of his ancestors which ascends without break to Paao [Remy 1859, in Nordhoff 1874:253].

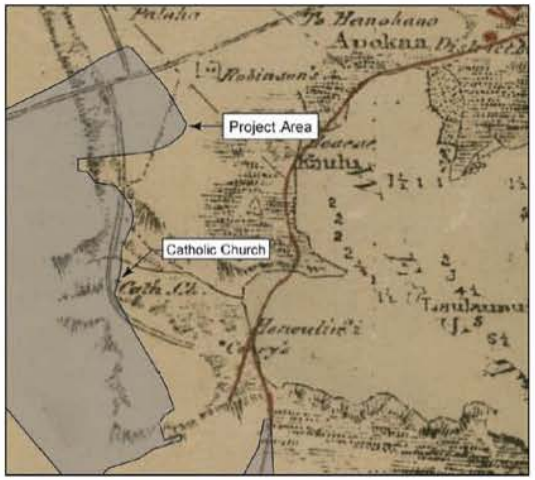

Figure 15. Portion of 1881 Hawai'i Government Survey Map of O'ahu (Alexander), showing location of the Catholic Church

The family was of Kailua, Kona, Hawai'i and converted to Catholicism very quickly after the arrival of Fathers Walsh and Ernest Herutel of the Catholic Mission to Kona in 1840. His parents sent him to Catholic school in Honolulu in 1845 to become a teacher. Father Ernest writes:

> Father Martial writes me about our little Zepherin, telling me that he has been received as teacher but that because they have no school to give him as yet, he has not received his diploma. Father Desire wants to keep him to send to the High School; but when will you have a High School? Perhaps not so soon. I think therefore that Zepherin would be more useful here as we lack teachers [cited in Beckwith 1978:4].

As noted above, Remy claims that at some point, Kepelino was a school teacher in Kailua; although Remy is believed to have met Kepelino in 1853, his teaching position at Kailua could have dated to an earlier period, possibly around 1845, when Father Ernst suggested that he return to the island of Hawai'i from Honolulu. At some point he attended the Catholic High School at Ahuimanu (established in 1846), where he is said "to have acquired English, French, Latin, and Greek" (Beckwith 1978:5). In 1847, at the age of 17, he was sent briefly with Father Ernest to Tahiti to help establish a Catholic mission. He developed a reputation for his pranks and was sent back to his parents (Beckwith 1978:5).

Controversial letters under the name of Z. Kahoali'i, addressed from the town of Honouliuli on O'ahu, were published in Catholic newspapers from 1860-1869. A letter in the Public

Instruction Correspondence filed and dated 11/26/1851, written by a school teacher name Naheona to the Minister of Public Education, state his reasons for the rejection of a teacher "Kepilina" and accuses Kepilina of "dancing and thieving while employed as teacher of Honouliuli School and of general improper conduct." The letter also mentions "Catholic priests in the area who have been among the people for a while who do not recommend retaining Kepilina" (In Silva 1987:A8). It seems quite probable that Kepelino lived at Honouliuli from 1851 into the 1870s and that as a devout Catholic and teacher that he taught at the school house next to Kapalani Church.

Detailed biographic information on Kepelino is not readily available, which is probably due in part to the fact that he was "controversial" for the Catholics and for the government. He went on to become Queen Emma's secretary (by at least 1874) and was one of the most important documenters about Hawaiian beliefs and traditions. He supported Queen Emma as the heir of King Lunalilo over David Kalākaua, and wrote letters to the king of Italy and the queen of England, asking for warships to support Queen Emma's cause. In 1874, the newly elected King Kālakaua had him tried for high treason and sentenced him to hanging, but the sentence was commuted and he was released from prison in 1876; he died in 1878 (Day 1984:77).

"The Honouliuli church . . . had by the 1880s outlived its usefulness and become dilapidated. It was therefore abandoned and replaced by a simple structure close, too close to the mill" [at 'Ewa Village, south of the project area] (Schoofs 1978:111). However, "in 1891 Honouliuli was still important enough to acquire its own Catholic cemetery" (Schoofs 1978:110). Whether this cemetery or any other Catholic cemetery was on the grounds of the Kapalani Church is unknown. In the late 1920s, Bishop Alencastre exchanged land at Honouliuli with Campbell Estate for land at 'Ewa Village to establish a new church.

3.2.6 Honouliuli Māhele Awards to *Ali'i*

In 1855 the Land Commission awarded all of the unclaimed lands in Honouliuli, 43,250 acres, to Miriam Ke'ahikuni Kekau'ōnohi (Royal Patent #6971 in 1877; Parcel #1069 in the Land Court office), a granddaughter of Kamehameha I, and the heir of Kalanimōkū, who had been given the land by Kamehameha after the conquest of O'ahu (Indices of Awards 1929; Kame'eleihiwa 1992). Kekau'ōnohi was also awarded the *ahupua'a* of Pu'uloa, but she sold this land in 1849 to Isaac Montgomery, a British lawyer.

Kekau'ōnohi was one of Liholiho's (Kamehameha II's) wives, and after his death, she lived with her half-brother, Luanu'u Kahalai'a, who was governor of Kaua'i (Hammatt and Shideler 1990:19-20:20). Subsequently, Kekau'ōnohi ran away with Queen Ka'ahumanu's stepson, Keli'iahonui, and then became the wife of Chief Levi Ha'alelea. Upon her death on June 2, 1851, all her property was passed on to her husband and his heirs. A lawsuit (Civil Court Case No. 348) was brought by Ha'alelea in 1858, to reclaim the fishing rights of the Pu'uloa fisheries from Isaac Montgomery, and the court ruled in Ha'alaea's favor. In 1863, the owners of the *kuleana* lands deeded their lands back to Ha'alelea to pay off debts owed to him (Frierson 1972:12). In 1864, Ha'alelea died, and his second wife, Anadelia Amoe, transferred ownership of the land to her sister's husband John Coney (Yoklavich et al 1995:16).

3.2.7 Early Ranching in on the 'Ewa Plain

John Coney rented the land to James Dowsett and John Meek in 1871, who used the land for cattle grazing. In 1877, the land, except for the *'ili* of Pu'uloa, was sold to James Campbell. He drove off 32,237 head of stock belonging to Dowsett and Meek and to James Robinson and constructed a fence around the outer boundary of his property (Bordner and Silva 1983:C-12). He let the land rest for one year and then began to restock the ranch, so that he had a head of 5,500 head after a few years (Dillingham 1885, cited in Frierson 1972:14)

In 1880-81, the Honouliuli ranch was described as:

> . . . Acreage, 43,250, all in pasture, but possessing fertile soils suitable for agriculture; affords grazing for such valuable stock. The length of this estate is no less than 18 miles. It extends to within less than a mile of the sea coast, to the westward of the Pearl River inlet. . . . There are valuable fisheries attached to this estate . . . . [Bowser 1880:489].
>
> From Mr. Campbell's veranda, looking eastward, you have one of the most splendid sights imaginable. Below the house there are two lochs, or lagoons, covered with water fowl, and celebrated for their plentiful supply of fish, chiefly mullet. . . . Besides Mr. Campbell's residence, which is pleasantly situated and surrounded with ornamental and shade trees, there are at Honouliuli two churches and a school house, with a little village of native huts [Bowser 1880:495].

Most of Campbell's lands in Honouliuli were used exclusively for cattle ranching. At that time, one planter remarked "the country was so dry and full of bottomless cracks and fissures that water would all be lost and irrigation impracticable" (Ewa Plantation Co. 1923:6-7). In 1879, Campbell brought in a well-driller from California to search the 'Ewa plains for water, and the well, drilled to a depth of 240 feet near Campbell's home in 'Ewa, resulted in ". . . a sheet of pure water flowing like a dome of glass from all sides of the well casing" (The Legacy of James Campbell n.d., cited in Pagliaro 1987:3). Following this discovery, plantation developers and ranchers drilled numerous wells in search of the valuable resource. A Hawai'i Visitor Bureau marker, located in the southwestern portion of the project area, bears the inscription "Site of First Artesian Well in the Hawaiian Islands drilled by James Ashley for James Campbell owner of Honouliuli Ranch brought in on Sept. 22, 1879." Kuykendall (1967:III, 67) states that this well was "near Campbell's ranch house" but Campbell's ranch house, which is shown on Monsarrat's 1878 map, was located outside the project area.

3.2.8 History of the Ewa Sugar Plantation

3.2.8.1 General History of the Plantation

In 1886, Campbell and B. F. Dillingham put together the "Great Land Colonization Scheme," which was an attempt to sell Honouliuli land to homesteaders (Thrum 1886:74). This homestead idea failed, but with the water problem solved by the drilling of artesian wells, Dillingham decided that the area could be used instead for large-scale cultivation (Pagliaro 1987:4). During the last decade of the nineteenth century, the railroad would reach from Honolulu to Pearl City in 1890, to Wai'anae in 1895, to Waialua Plantation in 1898, and to Kahuku in 1899 (Kuykendall

1967:III, 100). This railroad line eventually ran across the center of the 'Ewa Plain at the lower boundary of the sugar fields.

To attract business to his new railroad system, Dillingham subleased all land below 200 ft to William Castle, who in turn sublet the area to the newly-formed Ewa Plantation Company (Frierson 1972:15). Dillingham's Honouliuli lands above 200 ft that were suitable for sugar cane cultivation were sublet to the Oahu Sugar Company (Figure 16). Throughout this time, and continuing into modern times, cattle ranching continued in the area, and Honouliuli Ranch - established by Dillingham was - the "fattening" area for the other ranches (Frierson 1972:15).

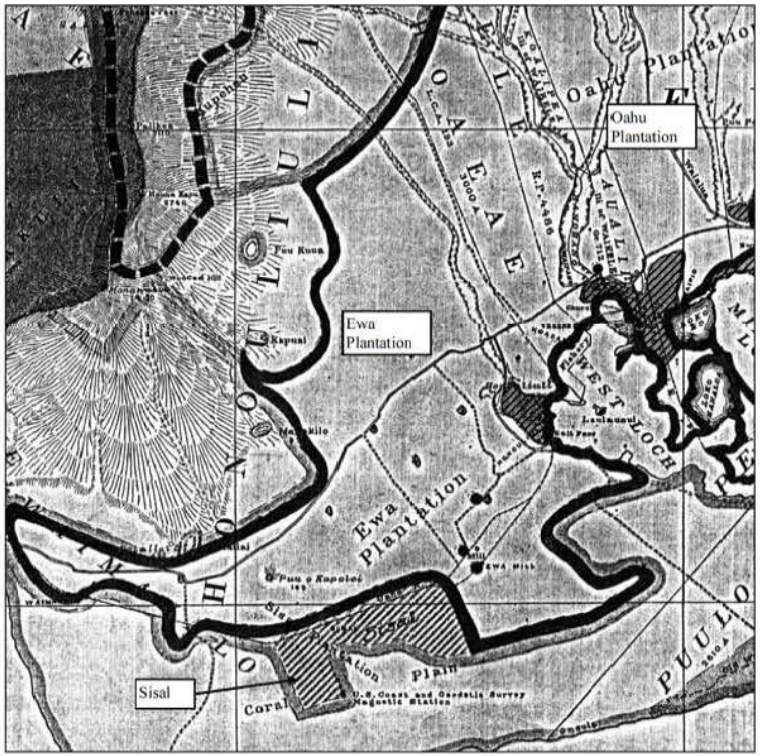

Figure 16. 1902 map showing relationship of Ewa Plantation and the Oahu Sugar Co. plantation; also note location of sisal growing area

Ewa Plantation Company (Figure 17) was incorporated in 1890 for sugar cane cultivation. The first crop, 2,849 tons of sugar, was harvested in 1892 at the Ewa Plantation. Ewa was the first all-artesian plantation, and it gave an impressive demonstration of the part artesian wells were to play in the later history of the Hawaiian sugar industry (Kuykendall 1967:III, 69). As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the Ewa Plantation Company installed ditches running from the lower slopes of the mountain range to the lowlands. When the rainy season began, they plowed ground perpendicular to the slope so that soil would be carried down the drainage ditches into the lower coral plain. After a few years, about 373 acres of coral wasteland were reclaimed in this manner (Immisch 1964). It is uncertain if there was also a deliberate effort to induce erosion on the scarp (called Evans Bluff by the Campbell Estate), near the eastern boundary of the project area, but it would have been easy to do and probably very effective. By the 1920s, Ewa Plantation was generating large profits and was the "richest sugar plantation in the world" (*Paradise of the Pacific,* Dec. 1902:19-22, cited in Kelly 1985:171).

Just north of 'Ewa Plantation was the equally sprawling O'ahu Sugar Company which "covered some 20 square miles . . . ranging in elevation from 10 feet at the Waipio Peninsula . . . to 700 feet at the Waiahole Ditch" (Condé and Best 1973:313) (see Figure 16). The Oahu Sugar

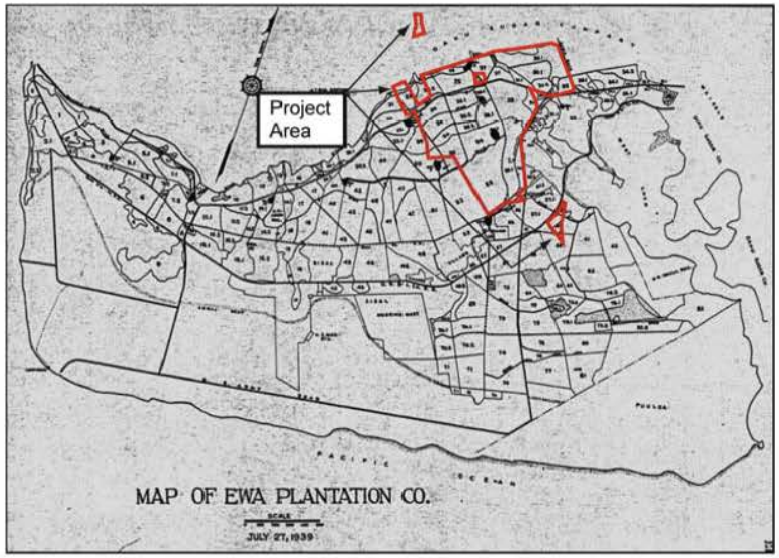

Figure 17. 1939 map of the Ewa Plantation Co. lands, showing project area

Company was incorporated in 1897. Prior to commercial sugar cultivation, the lands occupied by the Oahu Sugar Company were described as being "of near desert proportion until water was supplied from drilled artesian wells and the Waiahole Water project" (Condé and Best 1973:313). The Oahu Sugar Company took control of the Ewa Plantation lands in 1970 and continued operations until 1995, when they decided to shut down sugar cane production in the combined plantation area (Dorrance and Morgan 2000:45, 50).

3.2.8.2 History of PipeLine Village

During the twentieth century, the Ewa Plantation would continue to grow and, by the 1930s, would encompass much of the eastern half of Honouliuli Ahupua'a. This growth compelled the creation of plantation villages to house the growing immigrant labor force working the fields. In the decade of the 1890s, the plantation built 72 houses, cottages or dwellings; in the first decade of this century, 536; in the second decade, 132; in the 1920s, 285; in the 1930s, 168; and, in the 1940s, only 35. Censuses of the Ewa Plantation population record 4,967 persons in 1928, 4,477 in 1929, and 4,100 in 1932. After the outbreak of World War II, which siphoned off much of the plantation's manpower, along with the changeover to almost complete reliance on mechanical harvesting in 1938, there was little need for the large multi-racial (Japanese, Chinese, Okinawan, Korean, Portuguese, Spanish, Hawaiian, Filipino, European) labor force that had characterized most of the early history of the plantation.

It is also important to note that in the history of construction, buildings were moved, demolished, and replaced all the time. As early as 1899, the plantation moved "the lower camp of thirty houses [believed to be duplexes built in 1890] to a position on the bluffs nearby . . . principally for sanitary reasons" (Ewa Plantation Company Annual Report for 1890).

The original location of these thirty houses is unknown. They probably were not in the area later known as "Lower Camp" and may have been in the Honouliuli Taro lands. It is also unknown where they moved to "on the bluffs," but it seems probable that they were moved to what became the west central portion of PipeLine Village near the present water pumping station in that vicinity. A 1908/1913 U.S. Army Fire Control map shows 47 houses in the area of PipeLine Village (Figure 18).

PipeLine Village was a major plantation community that lay in the central southern portion of the present project area and is shown in detail in a 1928 USGS map (Figure 19), which documents the location of about 160 houses, a church and a school. This was probably the great extent of PipeLine Village. An entry in the 1931 Annual Report of Ewa Plantation Company records that "The PipeLine Village of 162 cottages built in 1906" was dismantled and that "other cottages near [near the factory, south of the project area] were erected using the reclaimed lumber from the PipeLine Villages. Photos (Bishop Museum Visual Collection) dated 1906 (Figure 20) show what appears to be brand new single family residences at PipeLine Village, but the Annual Report for 1906 documents the construction of only 47 houses and many of there were probably not built in PipeLine Village. Photos dated 1907 (Figure 21) show houses at PipeLine village with very well established garden and tall banana, papaya, and many mango trees, suggesting that they are significantly older. Another photo dated January 1910 (Figure 22) shows a line of ten new cottages with the caption "Pipe Line Village (Family houses built

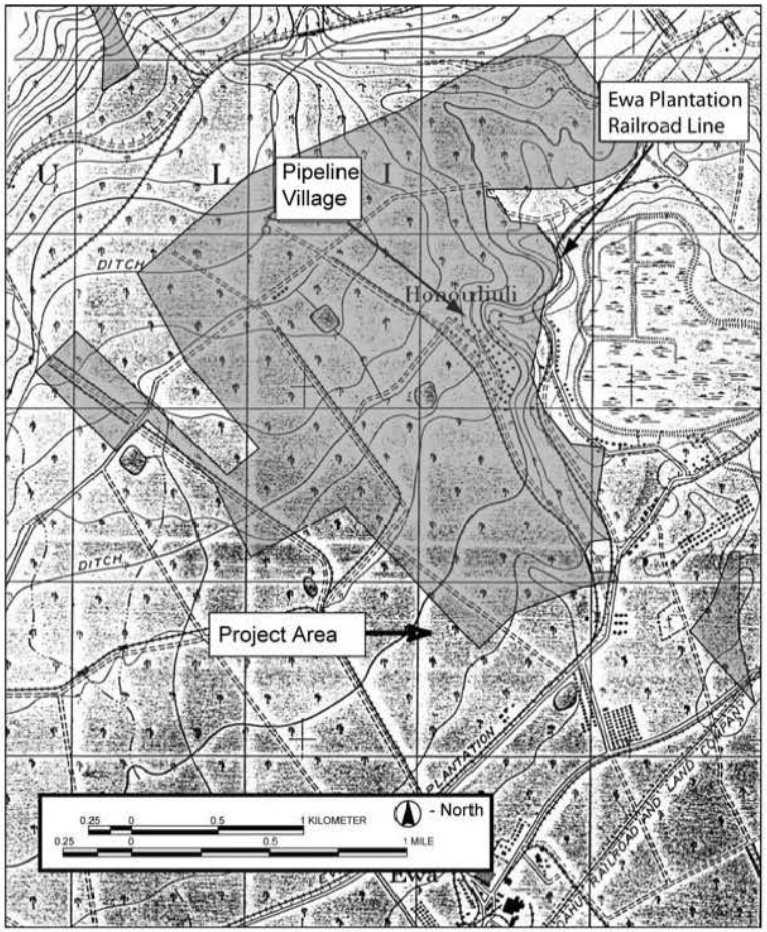

Figure 18. Portion of an 1908/1913 U.S. Army Fire Control map, showing 47 houses in PipeLine Village; map also shows the alignment for the Ewa Plantation railway (project area shaded in dark gray)

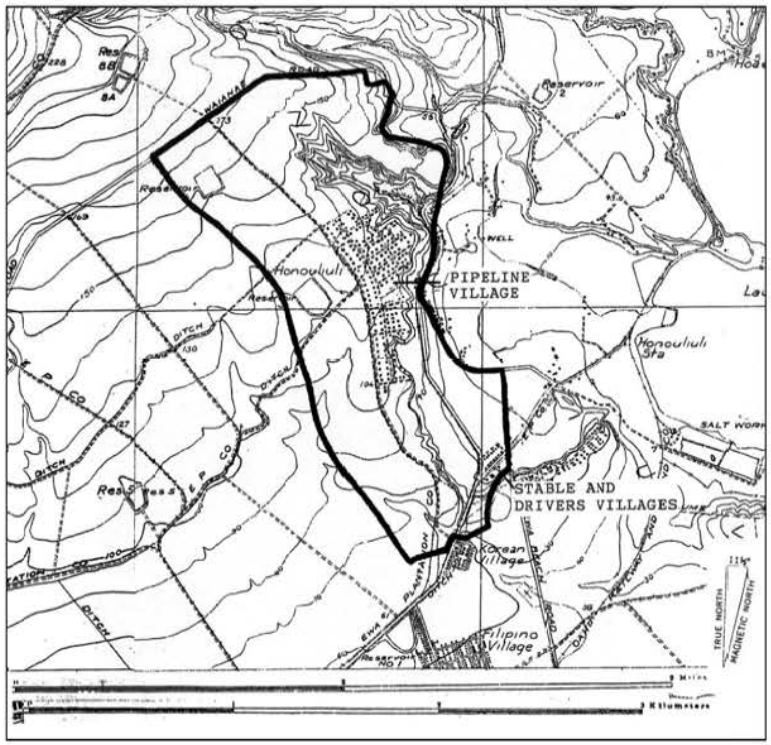

Figure 19. 1927/1928 US Geological Survey map, showing location of PipeLine Village, Stable Village, Driverss Village, and other Ewa Plantation structures

Figure 20. Portuguese family residence at PipeLine Village 1906

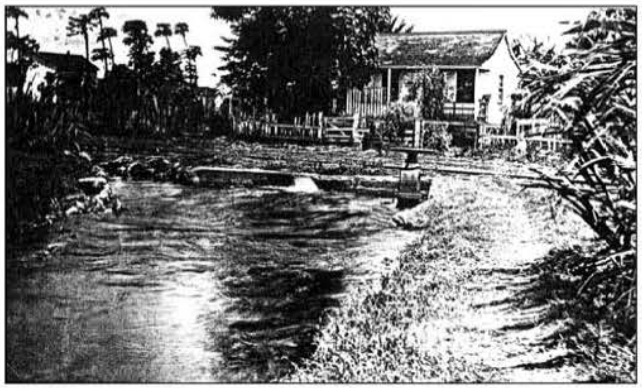

Figure 21. Discharge Pump No. 5, PipeLine Village 1907

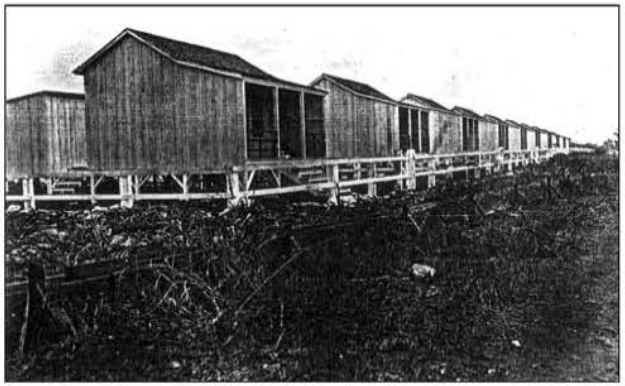

Figure 22. PipeLine Village, famly houses built in 1909, photograph taken on January 1910

Figure 23. PipeLine Village, April 7, 1907; *forno* (Portuguese brick bread oven) at center of photograph

during 1909)." A 1907 photo (Figure 23) shows blocks of houses separated by wooden fences, and a *forno* (Portuguese brick bread oven) in the center. One hundred and twenty-nine cottages were built for married laborers in that year and they include the majority of the houses at PipeLine Village. In 1911 "60 new houses, principally for Spanish and Portuguese workmen with families" were erected. Thus, it seems highly probable that PipeLine village was largely constructed between 1906 and 1911, but may have incorporated a number of relocated structures dating to 1890. The demolition of 1931 was probably quite thorough, and not a trace of the structures was found on later maps.

3.2.8.3 History of Stable Village and Drivers Village

The Ewa Plantation housing located in the southeastern corner of the project area, just north of the present Hale o Ulu School, is not well-documented. It appears that there were at least two small villages located here: "Stable Village" and "Drivers Village." The Ewa Plantation Company Annual Report for 1931 states that "The Drivers Village, located near the main stable was in such a bad location that it was decided to move all the fourteen cottages down to 'B' village near the factory." Drivers Village doubtlessly corresponds to the site of the 14 houses shown on the 1927/1928 map (see Figure 19), with Stable Village probably referring to the structures just to the south across the street. The date of construction of these villages is unknown. No houses are shown in this area on the 1908/1913 Fire Control map (see Figure 18). The villages were probably built in that flurry of construction in the first decade of this century. All of the structures of Stable Village and Drivers Village are shown on the War Department Map of 1943, but this map may be another example of a lack of military intelligence regarding the Pearl Harbor area; records indicate that the houses were probably all demolished around 1931.

3.2.8.4 Other Enterprises in Campbell Lands

As noted above, part of Mr. Campbell's lands were also used to grow rice. By 1885, 200 acres in Honouliuli were used for rice and 50 acres were used to grow bananas (article in *Pacific Commercial Advertiser*, August 15, 1885, summarized in Silva 1987:A-12). These rice fields were planted in former taro fields or in undeveloped swamps, such as those near the project area in the former Honouliuli Taro lands. The rice fields in 1882 were described by Frank Damon, during a tour of the area.

> . . . Towards evening we reached Honouliuli, where the whole valley is leased to rice planters . . . This was one of the largest rice plantations we visited. Sometimes two or three men only, have a few fields which they cultivate for themselves, and we often too came upon houses where there were eight or ten men working their own land. But the larger plantations are owned by merchants in Honolulu, who have a manager acting for them. . . . [Damon 1882:37].

In 1890, Dillingham leased all land below 200 ft to William Castle, who used most of the land for sugar cane, but also leased some lands for rice cultivation, pasture, wood lots, bee-keeping, garden crops, and quarries. Some land above 650 ft was also leased for the cultivation of canaigre, which may be a word used for pineapple (Frierson 1972:15-16).

An additional agricultural trial was conducted in the Honouliuli area for the cultivation of sisal, a plant used to make fibers for rope and other material. Some sisal was planted before 1898 and production continued until the 1920s (Frierson 1972:16). This was grown mainly on the coastal plain of Honouliuli in Kānehili, just *mauka* of Kualaka'i Beach (now Nimitz Beach). An article in the *Paradise of the Pacific* in 1902 described this venture in glowing terms.

> . . . The venture was made and a tract of land containing a large percentage of disintegrated coral, in the neighborhood of Ewa Plantation, where nothing else would grow, was chosen for the planting. . . . The Hawaiian Fiber Co., which Mr. Turner organized, and of which he is now manager, has 755 acres under fence, two and a half miles of which is stone wall with good gates at convenient places. . . . In a large field containing 130 acres, mauka of the Oahu Railway & Land Co. track, the first harvest is to be gathered in a few months. . . . Out of this section of 130 acres the company has figured on securing 50 tons of clean fiber, for which it is offered eight cents per pound in Honolulu or nine cents per pound in San Francisco . . . . [*Paradise of the Pacific* March 1902:17].

Although many of the fishponds at Pearl Harbor deteriorated from lack of care and lack of people to maintain them in the early nineteenth century, there was some action to reclaim these areas in the later part of the century. Some were converted to rice fields, but others were maintained as fish ponds or duck ponds. Records of the Minister of Public Instruction (1848) show that some ponds were maintained by local teachers and students, with the funds generated used for the upkeep of the school system. Some ponds as early as 1848 were also maintained by prisoners, possibly from the women's prison located at Honouliuli. In 1852, however, Levi Ha'alelea reasserted his claims to these neglected lands, when he claimed all of the mullet from this area be reserved to him (Hawai'i Kingdom files, cited in Silva 1987:A-7 to A-9). During James Campbell's tenure of the land, fish ponds and Pu'uloa fishing rights were leased out to various entrepreneurs (Kelly 1985:175).

Into the early twentieth century, some Hawaiian families continued to live in Honouliuli and preserve the traditional lifestyle, including at the fishing village of Kualaka'i. One resident, Mrs. Eli Williamson, recalled:

> In the Honouliuli area the train stopped among the *kiawe* (algaraboa) trees and *malina* (sisal) thickets. We disembarked with the assorted food bundles and water containers. Some of the Kualaka'i '*ohana* (family) met us to help carry the '*ukana* (bundles) along a sandstone pathway through the *kiawe* and *malina*. The distance to the frame house near the shore seemed long. When we departed our '*ukana* contained fresh lobsters, *limu* (algae), fish and *i'a malo'o* (dried fish) . . . [Williamson, in Kelly 1985:160].

3.2.9 The Military and Modern Developments

In 1891, Russian explorer Otto Von Kotzebue tried to observe Pearl River, but his group could not obtain a canoe. What he was told, however, led him to speculate on the possible importance of Pearl Harbor to the future.

> In the mouth of this river are several islands; it is so deep, that the greatest ship of the line can lie at anchor a few fathoms from the shore; and so broad, that a hundred vessels can conveniently find room in it. The entrance into the Pearl Rivers is in the same situation as the harbour of Hana-rura [Honolulu]; but the windings between the reefs are, however, said to render a passage more difficult. If this place were in the hands of the Europeans, they would certainly employ means to make this harbour the finest in the world [Von Kotzebue 1821:338-348].

The early missionary Levi Chamberlain was able to take an outrigger canoe trip to Pearl River, and noted the difficulty of access for larger ships.

> Kawaa took passage in our canoe to go down the harbor to a place where oysters are abundant to give orders to his people to gather a mess. The sail down the harbor was delightful . . . The passage down the creek for a number of miles was very pleasant till we got down near the reef and our course altered. We then could sail no longer as the wind was against us. The sail was lowered the mast taken down and secured across the outrigger and the rowers plied their paddles [Journal of Levi Chamberlain 1822-1849, Hawaiian Mission Schools, Storage Case 4, p. 899, from Sterling and Summers 1978:51].

The first foreign attempt to survey Pearl Harbor was made in 1840 during the U.S. Exploring Expedition, led by Charles Wilkes.

> In this district is a large inlet of the sea, into which the river Ewa empties; at the entrance of this inlet is the village of Laeloa (at Kalaeloa Point): the shore is known by the name of Pearl River or harbour, from the circumstance that the pearl oyster is found here; and it is the only place in these islands where it occurs.
>
> The inlet has somewhat the appearance of a lagoon that has been partly filled up by alluvial deposits. At the request of the king, we made a survey of it: the depth of water at its mouth was found to be only fifteen feet; but after passing this coral bar, which is four hundred feet wide, the depth of water becomes ample for large ships, and the basin is sufficiently extensive to accommodate any number of vessels. If the water upon the bar should be deepened, which I doubt not can be effected, it would afford the best and most capacious harbour in the Pacific. . . . [Wilkes 1970:79].

Although Wilkes was impressed by the harbor, he was not at this time thinking of how this survey could benefit the American government in the future. In fact, Wilkes (1970:79) concluded, "As yet there is no necessity for such an operation, for the port of Honolulu is sufficient for all the present wants of the islands, and the trade that frequents them."

This had changed in less than 30 years, however. The U.S. military had tried to make a coaling station on Midway Island in 1869 by blasting through the coral reef to make a harbor; this plan failed. In 1873, General Schofield presented a confidential report to the U.S Secretary of War, recommending that Pearl Harbor should be available to the U.S. Navy. Schofield wrote:

> In case it should become the policy of the Government of the United States to obtain the possession of this harbor for naval purposes, jurisdiction over all the waters of Pearl River with the adjacent shores to the distance of 4 miles from any anchorage should be ceded to the United States by the Hawaiian Government. . . .
>
> The cession of Pearl River could probably be obtained by the United States in consideration of the repeal of the duty of Sandwich Island sugar. Indeed, the sugar –planters are so anxious for a reciprocity treaty, or so anxious rather for free trade in sugar with the United States, that many of them openly proclaim themselves in favor of annexation of these islands of the United States [Sen. Ex. Docs, 52nd Cong. 2nd Sess. No. 77, pp. 150-154, reproduced in Judd 1971:Appendix 3].

This reciprocity treaty was concluded in 1876 with the provision that Hawai'i would not "lease or relinquish sovereignty to another country or any harbor, etc." In 1887, the treaty was renewed and amended and allowed the United States the "exclusive right to enter the harbor of Pearl River, in the Island of Oahu, to establish and to maintain there a coaling and repair station for the use of vessels of the United States" (Judd 1971:128).

After annexation of the islands to the United States in 1899, development began in order to make a Pacific base that could be used as a staging area for the Spanish-American War (Coletta 1985:433). Dredging of the harbor began in 1901, and additional dredging to deepen and widen the channel was conducted in 1908 and again in the 1920s. Money for the funding of the construction of dry docks and other support facilities was approved in 1908. In 1931 the Navy built an ammunition depot at West Loch on a 213-acre parcel that it had bought from the Campbell Estate. Construction of a new depot in Lualualei Valley and at West Loch Harbor began in 1931.

In the early 1930s, the U.S. Navy leased 700 acres of the Campbell Estate to build Ewa Field, a base with a mooring mast for Navy dirigibles. Although the mast was completed, the program was abandoned before the *Akron*, the designated airship for the mast, was built. In 1937, 18 miles of roads were built in the coastal Honouliuli area, and in 1939-1940 the U.S. bought 3,500 acres of land in this area (Landrum et al 1997:62-67), to build several other military camps and installations, including Barbers Point Naval Air Station, at the site of the old mooring mast.

On December 7, 1941, the Japanese Navy launched the devastating surprise attack on the United States base at Pearl Harbor and other military facilities. Although the major battle damage to the US Pacific Fleet was at its base at Ford Island in the Middle Loch of Pearl Harbor, Honouliuli did not escape unscathed.

> The Waipahu and Ewa sugar plantation, next to Pearl Harbor and the town of Wahiawa, adjoining Schofield Barracks, saw more action than did Honolulu.
>
> At Waipahu, machine gun bullets, shrapnel, and shells started two cane fires, riddled the sugar mill, hit the plantation hospital in four places, went through the roof of the company store, exploding in an electric supply warehouse, and narrowly missed many houses. In nearly all of the fields of tall cane, many of which contained terrified women and children, shells buried themselves-dozens of

> them in some concentrated areas-blasting holes in the ground the size of barrels, and flattening cane for several square yards.
>
> At Ewa, after bombing the nearby Marine airfield [at Barbers Point], enemy planes machine-gunned the plantation's main street, the mill and power plant and some 30 houses and started two cane fires [Allen 1999:20].

The attack had consequences not only for the military, but also for the civilians, mostly Japanese, who lived around West Loch.

> Two permanent local evacuations were ordered in the first month of the war, partly to remove civilians from areas which might be dangerous in event of further attack and partly to protect installations from possible sabotage or espionage activities. On a Thursday less than two weeks after the bombing, farmers adjacent to West Loch at Pearl Harbor were ordered to leave their farms by sundown. The order was modified to allow two days to prepare and the men were permitted to return to their farms during daylight until livestock could be moved and crops harvested. The displaced farmers, who had only recently been established at West Loch by the Farm Security Administration were forced to seek temporary housing with friends and relatives at Ewa plantation. Since they had invested in the enterprises practically all of their life's savings and considerable money borrowed from the FSA as well, several suffered heavy losses [Allen 1999:122].

Section 4 Previous Archaeological Research

4.1 Early Archaeological Surveys

All archaeological projects previously conducted in Honouliuli and Pu'uloa are listed in Table 3. Two archaeological features, a boundary *pōhaku* or rock and a *hōlua,* or sledding site, are recorded only in the Boundary Commission Reports establishing the division lines between the *ahupua'a* of Honouliuli and Hō'ae'ae (to the east). The surveyor wrote of the southern point of this boundary:

> In regard to Hoaeae . . . the point of commencement is Pōhaku Palahalaha, a well known rock, now marked by an arrow and the name "Honouliuli" on one side and "Hoaeae" on the other, which I have made the initial point of the survey . . . [Commission on Boundaries, Vol. 1:243].

This rock is shown on the Sterling and Summer map (see Figure 9) as Pōhaku Palaha. In another boundary survey, the *pōhaku* is called a "large, flat rock" (Boundary Commission Vol. 1:249), which may indicate the origin of the name from the Hawaiian word *pālaha*, which means "flattened, wide" (Pukui and Elbert 1986:307). As the surveyor continued to walk the Honouliuli/Hō'ae'ae boundary, he marked the northern point of the division as:

> The Kamaaaina took me to the corner of Pauhala (?)-Hoaeae and Honouliuli – there is an ancient holua or sleding [*sic*] place near this – which is agreed for the ancient corner. . . [Commission on Boundaries Vol. 1:243].

The earliest attempt to record archaeological remains in Honouliuli Ahupua'a was made by Thrum (1906:46). He reported the existence of a *heiau* located on Pu'uokapolei, west of the present project area. In a second monograph on *heiau*, Thrum (1917) called this *heiau* Palole'i (Kapolei). Emory mapped and photographed these structures in 1933 (field notes), but they were dismantled and destroyed sometime before McAllister's survey of the islands in the 1930s. According to legend, Pu'uokapolei was the location on which Kamapua'a, the pig-god, resided with his grandmother, Kamaunuahihio (McAllister 1933:108).

In his surface survey of the 1930s, archaeologist J. Gilbert McAllister recorded the specific locations of important sites, and the general locations of less important sites (at least at Honouliuli). McAllister recorded 14 specific sites at Honouliuli, numbered Sites 133-146 (McAllister 1933:107-108) (see Figure 9). Site 146, which McAllister used to denote the entire 'Ewa coral plains, is the only one of these sites in the project area. This "site," which is more of a general area covering all the coastal flatlands of 'Ewa would include portions of the current project area (all area outside the Honouliuli Gulch). Within Site 146, McAllister noted old ranching walls, salt work reminas, and coral pits used by the Hawaiians for cultivation of certain plants, such as bananas and sugar cane. The other thirteen sites are all outside of the project area.

The first six sites are in the upland section of Honouliuli, *mauka* of the 'Ewa coral plain and Pu'uokapolei. Site 133 is a possible *heiau*, a small enclosure at the foot of Pu'u Kānehoa. It was still standing during McAllister's day, and local residents informed him of its sacred nature. Site 134 is Pu'u Kuina Heiau, located in a gulch at the foot of Mauna Kapu. Only traces of a large

Table 3. Previous archaeological work in Honouliuli and Pu'uloa

Author and Date	Report Type	Location
Thrum 1906	Heiau study	Hawaiian Islands
McAllister 1933	All island survey	O'ahu Island
Kikuchi 1959	Site letter report	Barbers Point
Bowen and Soehren 1962	Burial discovery	Barbers Point
Soehren 1964	Site letter report	Waimanalo Gulch
Lewis 1970	Reconnaissance survey	Barbers Point (harbor area)
McCoy 1972	Survey	Pu'uloa Elementary School Site
Hommon 1973	Survey and excavations	Honouliuli
Barrera 1975	Reconnaissance survey	Barbers Point (harbor area)
Clark and Cornolly 1975	Reconnaissance survey	Barbers Point (harbor area)
Oshima 1975	Reconnaissance survey	Barbers Point
Sinoto 1976	Cultural resources survey	Barbers Point (harbor area)
Bordner 1977a	Reconnaissance survey	Kalo'i Gulch
Bordner 1977b	Reconnaissance survey	Makaïwa Gulch
Clark 1977	Reconnaissance survey	Pu'uokapolei
Connolly and Clark 1977	Reconnaissance survey	Pu'uokapolei
Davis 1978	Scholarly paper	Barbers Point (harbor area)
Davis and Griffin 1978	Archaeological survey	Barbers Point (harbor area)
Hawai'i Marine Research Inc. 1978	Geoarchaeological reconnaissance	Barbers Point (harbor area)
Kirch 1978	Land snail study	Barbers Point (harbor area)
Sinoto 1978a	ReconnaissancesSurvey and burial salvage	NAVMAG -West Loch
Sinoto 1978b	Archaeological & paleontological salvage	Barbers Point (harbor area)
Barrera 1979	Archaeological & reconnaissance survey	West Beach
Clark 1979	Reconnaissance survey	Barbers Point (harbor area)
Cleghorn 1979	Reconnaissance survey	Barbers Point
Davis 1979a	Emergency excavations	Barbers Point (harbor area)
Davis 1979b	Emergency excavations	Barbers Point (harbor area)
Davis 1979c	Archaeological survey	'Ewa Marina Community
Jourdane 1979	Reconnaissance survey	'Ewa Marina Community
Komori and Dye 1979	Archaeological testing	West Beach
Sinoto 1979	Cultural resources survey	Barbers Point (harbor area)
Ahlo 1980	Reconnaissance survey	Solid Waste Processing Facility
Davis 1980	Research design	Barbers Point
Kirch and Christensen 1980	Land snail study	Barbers Point (harbor area)
Christensen and Kirch 1981	Land snail study	Barbers Point (harbor area)
Hammatt and Folk 1981	Archaeological & paleontological investigation	Barbers Point (harbor area)
Davis 1982	Academic paper	Barbers Point
McCoy et al. 1982	Proposal for investigations	Barbers Point (harbor area)
Neller 1982	Scholarly study	Barbers Point
Ahlo and Hommon 1983	Reconnaissance survey	Barbers Point (harbor area)
Bordner and Silva 1983	Reconnaissance survey	Waimānalo Gulch
Davis 1983	Archaeological & paleontological excavations	Barbers Point
Ahlo and Hommon 1984	Test excavations	Barbers Point (harbor area)
Hammatt 1984a	Reconnaissance survey	Kahe Point

Author and Date	Report Type	Location
Hammatt 1984b	Reconnaissance survey	'Ewa Marina Community
Haun and Kelly 1984	Research design	Naval Air Station
Tuggle 1984	Survey report	Naval Air Station
Barrera 1985	Archaeological survey	West Beach
Neller 1985	Review and evaluation	West Beach
Barrera 1986	Archaeological investigations	West Beach
Davis and Haun 1986	Intensive survey & test excavations	West Beach
Davis et al. 1986a, b	Research design	West Beach
Haun 1986a	Reconnaissance survey	Kapolei Town
Haun 1986b	Reconnaissance survey	Kapolei Town
Athens & Pietrusewsky 1987	Burial documentation	Iroquois Point
Davis and Haun 1987	Intensive survey & test excavations	West Beach
Dicks et al. 1987	Reconnaissance survey	West Loch
Rosendahl 1987a	Reconnaissance survey	Kapolei Town
Rosendahl 1987b	Reconnaissance survey	Ko Olina Resort
Rosendahl 1987c	Reconnaissance survey	West Loch
Rosendahl 1987d	Reconnaissance survey	Kapolei Golf Course
Welch 1987	Reconnaissance survey	Naval Air Station
Davis 1988a	Subsurface Survey	'Ewa Gentry
Davis 1988b	Reconnaissance survey	Barbers Point HECO
Kennedy 1988a	Reconnaissance survey	'Ewa Gentry
Kennedy 1988b	Field report	Waiau-Campbell Industrial Park
Rosendahl 1988	Reconnaissance survey	Camp Malakole
Sinoto 1988a	Reconnaissance survey	'Ewa Golf Course
Sinoto 1988b	Reconnaissance survey	Makakilo Golf Course
Bath 1989a	Petroglyph study	Waimānalo Gulch
Bath 1989b	Burial documentation	Kahe
Bath 1989c	Burial documentation	West Loch – Hō'ae'ae Point
Burgett and Rosendahl 1989	Subsurface archaeological testing	North of O.R.&L.
Hammatt and Shideler 1989a	Archaeological assessment	Barbers Point (harbor area)
Hammatt and Shideler 1989b	Reconnaissance survey	Kahe Point
Carlson and Rosendahl 1990	Inventory survey	Kaomi Loop Subdivision
Cleghorn and Davis 1990	Archaeological & paleontological investigation	Barbers Point (harbor area)
Collin and Kennedy 1990	Burial documentation	Pu'uloa Golf Course
Davis 1990a	Archaeological & paleontological study	Barbers Point (harbor area)
Davis 1990b	Archaeological & paleontological investigation	Barbers Point (HECO area)
Davis et al. 1990	Survey and test excavations	'Ewa Marina Community
Hammatt and Shideler 1990	Inventory survey	West Loch Bluffs
Hammatt, Robins, et al. 1990	Inventory survey	Makaïwa Hills
Hammatt, Shideler, et al. 1990	Inventory survey	'Ewa Villages
Kawachi 1990	Inadvertent burial find	Campbell Industrial Park
Miller 1990	Inadvertent burial find	Barbers Point, Nimitz Beach
Rosendahl 1990a	Letter report	Kapolei Golf Course
Rosendahl 1990b	Archaeological survey & test excavations	'Ewa Marina Community
Davis and Burtchard 1991	Inventory survey	NAVMAG-West Loch
Dunn et al. 1991	Inventory survey & test excavations	'Ewa Marina Community
Folk 1991	Reconnaissance survey	Kapolei Town

Author and Date	Report Type	Location
Goodman and Cleghorn 1991	Surface survey	Laulani Fairways Housing
Kennedy 1991	Subsurface testing	Pu'uokapolei
Hammatt 1991	Reconnaissance survey	Honouliuli Livestock Park
Hammatt and Shideler 1991a	Archaeological assessment	Barbers Point (harbor area)
Hammatt and Shideler 1991b	Inventory survey	St. Francis Medical Center West
Haun et al. 1991	Archaeological survey	Naval Air Station
Burgett and Rosendahl 1992	Inventory survey	Barbers Point (harbor area)
Charvet-Pond and Davis 1992	Data recovery	West Beach
Cleghorn and Anderson 1992	Inventory survey	Kahe Point
Hammatt and Folk 1992	Subsurface testing	Barbers Point (harbor area)
Erkelens 1992	Archaeological survey	Naval Air Station
Folk 1992	Subsurface testing	Barbers Point
Hammatt 1992	Inventory survey	Palikea
Jayatilaka et al. 1992	Survey and test excavations	Hawai'i Prince Golf Course
Kennedy et al. 1992	Data recovery	Pu'uloa Golf Course
Shideler et al. 1992	Assessment	Kahe Point
Trembly et al. 1992	Burial documentation	West Beach
Davis 1993	Archaeological & paleontological investigation	Barbers Point (harbor area)
Glidden et al. 1993	Data recovery excavations	Paradise Cove
Goodman et al. 1993	Reconnaissance survey	20-acre Commercial Project
Jones 1993	Fossil coral reefs study (Ph.D. dissertation)	Hawaiian Islands
Landrum and Schilz 1993	Reconnaissance & ubsurface testing	Naval Air Station
Miller 1993	Data recovery	Barbers Point (harbor area)
Nakamura et al. 1993	Inventory survey	Makakilo
Pantaleo and Sinoto 1993	Inventory survey	'Ewa Gentry
Hammatt and Shideler 1994	Archaeological assessment	Barbers Point (harbor area)
Hammatt et al. 1994	Inventory survey	Barbers Point (harbor area)
Tuggle 1994	Inventory survey	Barbers Point
Davis et al. 1995	Archaeological & paleontological investigation	Barbers Point (harbor area)
Dye 1995	Burial documentation	Barbers Point
Franklin 1995	Data recovery	'Ewa Marina Community
Hammatt and Shideler 1995	Data recovery plan	Barbers Point (harbor area)
Jourdane 1995	Burial documentation	Paradise Cove
Yoklavich et al. 1995	CRM overview	Barbers Point
Corbin et al. 1996	Reconnaissance Survey	Laulaunui Island
O'Hare et al. 1996	Intensive survey and testing	Naval Air Station
Schilz and Landrum 1996	Test excavations	Barbers Point
Spear 1996	Reconnaissance survey	Kapolei Town
Athens et al. 1997	Cultural resources, paleoenvironmental investigation	'Ewa Plain: Naval Air Station
Borthwick 1997	Assessment	Palehua, Honouliuli
Hammatt 1997	Inventory survey	Pu'uloa
Hammatt and Chiogioji 1997	Reconnaissance survey	Corridor in Honouliuli
Jensen and Head 1997	Reconnaissance survey	NAVMAG-West Loch
Tuggle 1997a	Cultural resource inventory	Naval Air Station
Tuggle 1997b	Synthesis	'Ewa Plain
Tuggle and Tomonari 1997a,b	Cultural resource inventory survey	Naval Air Station

Author and Date	Report Type	Location
Wickler and Tuggle 1997	Cultural resources, inventory survey	Naval Air Station
Wolforth and Wulzen 1997	Data recovery	West Loch Estates
Wulzen and Rosendahl 1997	Data recovery	Barbers Point Nimitz Beach
Goodfellow et al. 1998	Data recovery	West Loch
Hammatt and Shideler 1999	Inventory survey	Waimanalo Gulch
Magnuson 1999	Reconnaissance survey	Farrington Hwy.
McDermott et al. 2000	Data recovery	Barbers Point (harbor area)
Elmore et al. 2001	Inventory survey	Pu'uokapolei/Fort Barrette
Ostroff *et al.* 2001	Inventory survey	Pu'uokapolei
Tulchin et al. 2001	Inventory survey	'Ewa Shaft Renovation
Cordy and Hammatt 2003	Archaeological assessment	Barbers Point, north of O.R.&L.
McIntosh and Cleghorn 2003	Inventory survey	'Ewa Gentry Makai
Hoffman et al. 2004	Archaeological inventory survey	Between OR&L & Barbers Point
O'Hare et al. 2004	Documentation of plantation infrastructure	North of O.R.&L.
Terry et al. 2004	Archaeological inventory survey of two sinkholes	North of O.R.&L.
O'Hare et al. 2005	Field check	Kapolei Property

terrace remained. Site 135 is a series of enclosures *makai* of Pu'u Kuina Heiau. McAllister believed that the walls marked *kuleana* lots. Site 136 is a small platform near Mauna Kapu, a sacred site, possibly an altar. Site 137 is Pu'u Ku'ua Heiau, plotted on a ridge near Pu'u Ku'ua; it had been modified for use as a cattle pen; some areas had been cleared for pineapple cultivation or planted with ironwoods. Site 138 is Pu'uokapolei Heiau, which had been on the *makai* side of the hill before it was destroyed. The stones of the structure had been crushed in a nearby rock crusher. McAllister was also told that there was once a cave on the hill, in which Kamapua'a and his grandmother lived (McAllister 1933:107-108).

The last eight sites recorded by McAllister are adjacent to Pearl Harbor or the coast. Site 139 is Kalanamaihiki Ko'a (fishing shrine) at Kapapapuhi Point (north of the current study area). McAllister described it as "two large rough stones about 2.5 feet in size, with six or seven smooth stones averaging 1 foot in size in a small pile adjoining the larger stones." Site 140 is a 4-5 acre fishpond on Laulaunui Island in West Loch, opposite Kapapapuhi Point. McAllister recorded the entire West Loch of Pearl Harbor as Site 141, Kaihuopala'ai. Although some versions of the legend of the traveling mullet (see Section 3.1, Mythological and Traditional Accounts) say that there was a fishpond called Kaihuopala'ai, McAllister recorded that local informants said there was never a fishpond by that name here; rather it was the name for the loch. Site 142 is Kapamuku, or Pamoku fishpond, a 3-acre fishpond, located south of the current study area, opposite the tip of Waipi'o peninsula. Site 143 is 'Oki'okiolepe fishpond, south of Loko Pamoku. The walls of this 6-acre fishpond were made of coral. As mentioned, Site 146 was used to represent the entire 'Ewa Plain.

McAllister records Site 144 as the location of fish traps and a fishing shrine described by Stokes in his study of the fishtraps of Pearl Harbor. This is the location of the fishtraps Kapākule (Pākule) and Kepo'okala, as described by Samuel Kamakau (1976:88). McAllister listed Site 145 as Pu'uloa, a legendary site where the first breadfruit was planted. It is not known whether

Pu'uloa referred to is the '*ili* of Pu'uloa or the harbor of Pu'uloa, or an area within the '*ili* near the harbor. Site 146 covers the entire 'Ewa coral plain. This includes historic features, such as cattle walls and the walls near the Pu'uloa Salt Works, pre-Contact sites such as habitation, agricultural, and fishpond sites recorded by early European explorers, and paleontological sites, where in recent years many fossil bird bones have been discovered (McAllister 1933:108-110).

Between McAllister's 1930s study and the flurry of work that began in 1969, there are only a few sporadic pieces of research, which are not well documented. In 1933, Dr. Kenneth P. Emory recorded a well-preserved house site and a possible *heiau* (later destroyed by sugar cane cultivation) in the western part of the coral plains (Sinoto 1976:1). In 1959, William Kikuchi removed a number of burials from a burial cave site (Bishop Museum Site OA-B6-10) at the Standard Oil Refinery, which was subsequently destroyed (Barrera 1975:1). Kikuchi recovered 12-16 incomplete primary and/or secondary burials cached in a sinkhole or crevice exposed during construction activities near the big bend in Malakole Road (Kikuchi 1959; Davis 1990b: 146, 147). In 1960, Yoshi Sinoto and Elspeth Sterling visited a house site (BPBM. Site OA-B6-8) within 'Ēkaha Nui Gulch. "Around this elevation (1200 feet), along the sides of the stream, were seen remains of many terraces and some house sites" (Sterling and Summers 1978:37). In 1962, Lloyd Soehren recorded another secondary human burial in a sinkhole at the Barbers Point Naval Air Station (Davis 1990a:147). In 1966, Lloyd Soehren carried out salvage excavations at a possible fishing shrine (BPBM. Site # 50-OA-B6-13). The site was reported as destroyed by construction (Barrera 1975:1), but Davis relocated the shrine and performed additional excavations in 1982 (Davis 1990a:148).

4.2 Previous Archaeological Work near Honouliuli town

Beginning in the late 1970s, archaeological research has been conducted in Honouliuli in the general vicinity of the project area (Figure 24). Work has focused on the West Loch Estates (east of the current project area), Pearl Harbor Naval Magazine (NAVMAG) – West Loch (east of the current project area), the 'Ewa Gentry project (south of the current project area), and 'Ewa Villages (south of the project area).

4.2.1 West Loch Estates

An archaeological reconnaissance survey (Rosendahl 1987c) was conducted in association with the development of the 232-acre "West Loch Estates" Residential Increments I and II (including golf course and parks) project, which lies to the east of the present project area, in the section of the Honouliuli Taro lands adjacent to Pearl Harbor. This project covered portions of the old town of Honouliuli, the focus of population in the early historic period (and possibly earlier). This study identified a modern cemetery (Site 3319) with a remnant pre-Contact deposit, two historic sites of minimal integrity with some possible pre-Contact deposits (Site 3318 and 3320) at Kapapapuhi Point, a significant pre-Contact deposit with trash pits, fire pits and at least one human burial (Site 3321), a buried fishpond (Site 3322), an historic fishpond (Site 3323) built in the 1890s during the construction of the OR& L railroad, and a buried pond field system (Site 3324) (Rosendahl 1987c:7, 9). It was noted that some artifacts "indicate the possibility of pre-1900 occupation" (Rosendahl. 1987c:8). As noted in the final reconnaissance survey report (Dicks et al. 1987:28) for the surface and subsurface reconnaissance survey, an effort was also made to relocate McAllister's Site 139, Kalanamaihiki Ko'a (fishing shrine). The archaeologists

Figure 24. U.S. Geological Survey topographic map, showing previous archaeological survey areas near the current project area

found a small boathouse and dock in the area and concluded that the shrine had been destroyed since McAllister's survey in the 1930s.

A total of 21 radiocarbon dates were determined; at Site 3321, the cultural deposit, the age of a lower cultural deposit was dated to A.D. 540-880, while an upper deposit was dated to A.D. 1327-1640. For the buried fishpond (Site 3322), ages ranged from A.D. 70-610 in the lowest layer to A.D. 1160-1410 in the upper layer. For the buried pond field systems (Site 3324), ages ranged from B.C. 400-A.D. 240 (interpreted as the original surface of the upper valley) in the lowest layers to A.D. 1430-1952 in the upper layers of upper valley area and A.D. 1020-1280 in lower valley area. In summary, the authors (Dicks et al. 1987:78-79) concluded that agricultural use of the Honouliuli Stream floodplain for pondfield cultivation of taro may have begun in the lower valley segment as early as A.D. 1000, while cultivation of the upper valley pondfields may have begun as early as the thirteenth and fourteenth centuries. Site 3321in the upper valley may have been a habitation locus established as early as the mid-sixth to mid-ninth century (Wolforth et al. 1998).

In 1989, a burial was found on Hō'ae'ae Point (formerly called Kapapapuhi Point), when someone was digging under a mango tree on a residential property. There is no follow-up report (Bath 1989) to whether the bones were left in place or disinterred. The burial was given the site designation 50-80-13-4816.

4.2.2 NAVMAG – West Loch

In 1978, Sinoto conducted an archaeological reconnaissance survey on a 32-acre portion of NAVMAG-West Loch. A sinkhole 200 m inland and northwest of 'Oki'okiolepe Fishpond was found, containing ten human burials (Site 50-80-13-2310). The historic artifacts found in the pit, indicated that the pit was probably used by the Chinese in the historic period as a family crypt (Sinoto 1978a).

Davis and Burtchard (1991) conducted an archaeological inventory survey of a 36-acre lot for a proposed housing area in the Pu'uloa portion of NAVMAG-West Loch in 1991. No archaeological sites were found. They concluded that extensive alteration to the landscape due to military land disturbance had erased all surface traces of pre-Contact habitation.

In 1992, a crew from Archaeological Consultants of Hawai'i, Inc. (ARCH) conducted an archaeological inventory survey with subsurface testing, and later data recovery at the proposed Pu'uloa Golf Course (Kennedy et al. 1992). A total of 72 sites were identified, 47 from the pre-Contact/early historic period and 25 sites associated with ranching, military training, and modern quarrying. Radiocarbon dates of these habitation, agricultural, and ceremonial sites indicate that traditional Hawaiian use extended from A.D. 1090 to 1695.

An overview survey of the NAVMAG Lualualei was completed by Ogden Environmental and Energy Services in 1977 (Landrum et al. 1977). A total of ten sites had been previously recorded during the West Loch project area, three in the Honouliuli section, one within Pearl Harbor (Site 140, Laulaunui Island), five on Waipi'o peninsula, one in both (salt works), and one encompassing all lands (Pearl Harbor Navy Base). In Honouliuli, the sites were Site 141, Kaihuopala'ai (West Loch), Site 142, Loko Pamoku or Kapamuku, Site 143, 'Oki'okiolepe Fishpond, and salt works at Honouliuli (no site designation). NAVMAG-West Loch is considered part of the Pearl Harbor Navy Base (Site 50-80-13-9992) due to its importance during

World War II. The site was listed as a National Historic Landmark in 1966, on the National Register of Historic Places (NRHP) in 1966, on the State Inventory of Historic Places (SIHP), in 1971, and on the State Register of Historic Places in 1971 (Landrum et al. 1977:160).

In 1996, a crew from Paul H. Rosendahl, Ph.D., Inc. (PHRI) completed a Phase I archaeological reconnaissance survey of the 1,483 acres of land at the U.S. Naval Magazine – West Loch Branch (Jensen and Head 1997). This survey covered the southern section of Waipi'o peninsula on the east side of West Loch, Laulaunui Island, the Naval Reservation on the west side of West Loch, and the West Loch Outleased Cultivated Lands, which included the National Wildlife Refuge. Only 25% of the outleased lands were actually surveyed. The PHRI crew found that most of the outleased area had been bulldozed for sugarcane cultivation. Only a small strip adjacent to West Loch was unmodified. In the West Loch Outleased Lands, eight features were recorded; all but one was associated with military use of the area. The seven military sites consisted of six concrete slabs (Sites 50-80-13-5040, 5080, 5081, 5133, 5134), a metal container (5080), and a pressure tank (5133). The one non-military site (4971) was a cave with a partially blocked (blocked with roof fall) entrance that the crew members believed should be investigated in the future to see if it at one time was used as a pre-Contact or historic burial site (Jensen and Head 1997:85).

In 1996, a field reconnaissance of Laulaunui Island and fishpond was conducted by the State Historic Preservation Division (Corbin et al. 1996) to determine if restoration of the fishpond was possible and if the site would be a good candidate to be used as an educational tool. The crew simply walked to the island from the West Loch Waterfront Park; water depth varied from one to four feet. Five concrete structures, probably built by the military, were observed. The fishpond was surrounded by mangroves and was silted in; portions of a coral wall (about 500 ft long) around the pond were still intact, and a concrete gate allowed water to circulate into the pond.

4.2.3 'Ewa Villages

In 1990, Cultural Surveys Hawai'i conducted an archaeological reconnaissance survey of a 616-acre area, which included three extant plantation villages, (Renton, Tenney, and Varona Village), the sites of three former plantation villages (C Village, Mill Village, Middle Village), and other sites associated with the 'Ewa Plantation infrastructure (Hammatt, Shideler, et al. 1990:i). The survey found no evidence of any pre-Contact activity within the subject area and recommended further documentation of some of the ruined plantation structure sites.

In 1996, Scientific Consultant Services (Spear 1996) conducted an archaeological survey in an area west of the Tenney and Varona plantation villages and north of the Honouliuli Treatment Plant. No archaeological sites were identified.

4.2.4 'Ewa Gentry Project

In the initial reconnaissance (Kennedy 1988a) of the 1,016 acre 'Ewa Gentry survey area, no surface evidence of potentially significant pre-Contact remains was found. The old OR&L railroad bed/right of way (Site 50-80-12-9714) did form a portion of the *mauka* boundary. According to historic maps, a Filipino Camp for sugarcane workers once existed near the

intersection of the OR&L bed and a cane road near Ft. Weaver Road, but the archaeologists did not find any surface remains for this camp.

A subsequent subsurface exploration was undertaken. Eighteen backhoe trenches were excavated; however, "no evidence of past in situ cultural activity was found anywhere in the Ewa Gentry project area" (Davis 1988).

An inventory survey was conducted in 1993 by Aki Sinoto Consulting (ASC) (Pantaleo and Sinoto 1993) for the 'Ewa Gentry Off-Site Drainage System. This proposed drainage project area is a narrow strip that extends along the western boundary of NAVMAG West Loch, and is adjacent to the southern non-contiguous parcel (TMK 9-1-010:002) for the current project area. An 1897 map of Pearl Harbor indicated that the OR&L railroad, salt pans, and a fishpond were within this project area; only the railroad bed was found during the ASC survey. Iron flumes and concrete culverts (one with an inscribed date of July 1935) used for sugarcane irrigation were found bulldozed to the edge of the sugar cane fields near the dropoff to the shoreline of Pearl Harbor. These were not considered historically significant due to the absence of structural and locational integrity. No further archaeological work was recommended for this project prior to commencement of construction of the drainage system.

In 2003, Pacific Legacy (McIntosh and Cleghorn 2003) conducted an archaeological survey of the proposed 'Ewa Gentry Makai Development project area, which is adjacent to the southern (*makai*) boundary of the 'Ewa Gentry project area for the 1988 surface and subsurface inventory surveys (Kennedy 1988a; Davis 1988).

4.2.5 Previous Archaeology in the Current Project Area

As noted previously, and as discussed in more detail in the next section, a 546-acre portion of the current project area (the southeastern section) was previously surveyed in 1990 by a crew from Cultural Surveys Hawai'i. In 2005, a field assessment was conducted over the entire current project area by archaeologists from the firm Archaeological Consultants of the Pacific, Inc. (Elison and Kouneski 2005). The archaeologists found one "stone-faced hill" in the northern section of the project area (north of Farrington Highway), but did not describe it further. The report presents recommendations for field work in the different sections of the project area, concluding that the majority of the project area is farm land and did not need to be surveyed. Only the area around Honouliuli Gulch, and other areas of natural vegetation in the northern section needed to be surveyed.

4.3 Background Summary and Predictive Model

4.3.1 Honouliuli Settlement Patterns

The *ahupua'a* of Honouliuli is the largest traditional land unit on the island of O'ahu. Honouliuli includes all the land from the western boundary of Pearl Harbor (West Loch) westward to the 'Ewa/Wai'anae District Boundary with the exception of the west side of the harbor entrance, which is in the *ahupua'a* of Pu'uloa (the 'Ewa Beach/Iroquois Point area). This comprises approximately 12 miles of open coastline from One'ula westward to Pili O Kahe. The *ahupua'a* extends *mauka* (almost pie-shaped) from West Loch nearly to Schofield Barracks, and

the western boundary is the Wai'anae Mountain crest running *makai* to the east ridge of Nānākuli Valley.

Not only is there a long coastline fronting the normally calm waters of leeward O'ahu, but there are also four miles of waterfront along West Loch. The land immediately *mauka* of the Pacific coast consists of a flat karstic raised limestone reef forming a level nearly featureless "desert" plain marked in pre-Contact times (previous to alluviation caused by sugar cultivation) by a thin or non-existent soil mantle. The microtopography is notable in containing countless sinkholes in some areas caused by chemical weathering (dissolution) of the limestone shelf.

Along the eastern flank of the Wai'anae Mountains, numerous gulches have contributed to the alluvial deposits over the coastal limestone shelf. The largest of the gulches is Honouliuli Gulch, which drains into West Loch. The gulches are generally steep-sided in the uplands and generally of a high gradient until they emerge onto the flat 'Ewa plain. The alluvium they have carried has spread out in delta fashion over the *mauka* portions of the plain, which comprises a dramatic depositional environment at the stream gradient change. These gulches are generally dry, but during seasonal Kona storms carry immense quantities of runoff onto the plain and into the ocean. As typical drainages in arid slopes, they are either raging uncontrollably, or are dry and, as such, do not form stable water sources for traditional agriculture in their upper reaches. The Honouliuli gulches generally do not have valleys suitable for extensive irrigated agriculture; however, this lack is more than compensated for by the rich watered lowlands near West Loch.

Honouliuli Ahupua'a, as a traditional land unit, had abundant and varied resources available for exploitation by early Hawaiians. The "karstic desert" and marginal characterization of the limestone plain, which is the most readily visible terrain, does not do justice to the *ahupua'a* as a whole. The richness of this land unit is marked by the following available resources:

1) 12 miles of coastline with continuous shallow fringing reef, which offered rich marine resources.

2) Four miles of frontage on the waters of West Loch, which offered extensive fisheries (mullet, *awa*, shellfish), as well as frontage suitable for development of fishponds.

3) The lower portion of Honouliuli Valley in the 'Ewa plain offered rich level alluvial soils with plentiful water for irrigation from the stream as well as abundant springs. This land would have stretched well up the valley.

4) A broad limestone plain, which because of innumerable limestone sinkholes, offered a nesting home for a large population of avifauna. This resource may have been one of the early attractions to human settlement.

5) An extensive upland forest zone extending as much as 12 miles inland from the edge to the coastal plain. As Handy and Handy (1972:469) have pointed out, the forest was much more distant from the lowlands here than it was on the windward side, but on the leeward side was more extensive. Much of the upper reaches of the *ahupua'a* would have had species-diverse forest with *kukui*, *'ōhia*, sandalwood, *hau*, *ti*, banana, etc.

Within this natural setting, archaeological and traditional sources show a general pattern of three main areas of settlement within the *ahupua'a*: a coastal zone, the Honouliuli taro lands, and inland settlement at Pu'u Ku'ua.

4.3.2 The Coastal Zone - Kalaeloa (Barbers Point), Ko'ōlina (West Beach)

Kalaeloa (Barbers Point)

Archaeological research at Barbers Point has focused on the areas in and around the newly constructed Deep Draft Harbor (Barrera 1975; Davis and Griffin 1978; Hammatt and Folk 1981, McDermott et al. 2000). Series of small clustered shelters, enclosures and platforms show limited but recurrent use at the shoreline zone for marine-oriented exploitation. This settlement covers much of the shoreline with more concentrated features around small marshes and wet sinks. Immediately behind the shoreline, under a linear dune deposit, is a buried cultural layer believed to contain some of the earliest habitation evidence in the area.

The attraction of the area to early Hawaiians was the plentiful and easily exploited bird population. Particular evidence for taking of petrels occurs at Site -2763 (Hammatt and Folk, 1981:213). Initial heavy exploitation of nesting seabirds and other species in conjunction with habitat destruction probably led to early extinction. There is some indication of limited agriculture in mulched sinkholes and limited soil areas. Considering rainfall, this activity would have been limited, but probably involved tree crops and roots (sweet potatoes). The archaeological content of the sites indicates a major focus on marine resources.

Davis and Griffin (1978) distinguish functional classes of sites, based on surface area size and argues that the Barbers Point settlement consists of functionally integrated multi-household residence groups. Density contours of midden (by weight) and artifacts (by numbers) plotted for residence sites by Hammatt and Folk (1981) generally indicate narrowly defined spatial foci of discard, possibly indicating continuous use, or at least with no refurbishing or additions to the structures through time (Hammatt and Folk 1981). The focus is small habitation sites, typically lacking the full range of features found in large permanent residence complexes such as high platforms, complex enclosures, and ceremonial sites.

Ko'ōlina (West Beach)

There are three available studies on the Ko'ōlina project area (Davis et al. 1986a; Davis et al. 1986b; and Davis and Haun 1987).

Davis documents around 180 component features at 48 sites and site complexes consisting of habitation sites, gardening areas, and human burials. Chronologically the occupation covers the entire span of Hawaiian settlement, in what Davis and Haun describe as "one of the longest local sequences in Hawaiian prehistory" (Davis and Haun 1987:37). The earliest part of the sequence relates to the discovery of an inland marsh, and early dates were also obtained for the beachfront site and an inland rock shelter.

4.3.3 Honouliuli Taro Lands

Centered around the west side of Pearl Harbor at Honouliuli Stream and its broad outlet into the West Loch are the rich irrigated lands of the *'ili* of Honouliuli, which give the *ahupua'a* its name. The major archaeological reference to this area is Dicks, Haun, and Rosendahl (1987) who

documented remnants of a once-widespread wetland system (*lo'i* and fishponds) as well as dryland cultivation of the adjacent slopes. The current study area is adjacent (on the eastern project boundary) to this environmental zone.

The area bordering West Loch was clearly a major focus of population within the Hawaiian Islands, and this was a logical response to the abundance of fish and shellfish resources in close proximity to a wide expanse of well-irrigated bottomland suitable for wetland taro cultivation. The earliest detailed map (Malden 1825) shows all the roads of southwest O'ahu coalescing and descending the *pali* (cliff) as they funnel into the locality (i.e. Honouliuli Village). Dicks et al. (1987:78-79) conclude, on the basis of 19 carbon isotope dates and 3 volcanic glass dates that "Agricultural use of the area spans over 1,000 years." Undoubtedly, Honouliuli was a locus of habitation for thousands of Hawaiians. Pre-Contact population estimates are a matter of some debate but it is worth pointing out that in the earliest mission census (Schmitt 1973:19) 1831-1832, the land (*'āina*) of Honouliuli contained 1026 men, women, and children. It is not clear whether this population relates to Honouliuli Village or the entire *ahupua'a*, but the village probably contained the vast majority of the district's population. The nature of the reported population structure for Honouliuli (less than 20% children under 12 years of age) and the fact that the population decreased more than 15% in the next 4 years (Schmitt 1973:22) suggests that the prehistoric population of Honouliuli Village may well have been significantly greater than it was in 1831-1832. A conservative estimate would be that tens of thousands of Hawaiians lived and died at Honouliuli Village.

4.3.4 Pu'uku'ua: Inland Settlement

Documentation of inland settlement in Honouliuli Ahupua'a is more problematic in that there are relatively few documented archaeological sources. However, it is probable that the area around Pu'uku'ua, on the east side of the Wai'anae Ridge seven miles inland of the coast, was a Hawaiian place of some importance.

In 1899, Hawaiian Newspaper *Ka Loea Kālai'āina* relates a story of Pu'uku'ua as "a place where chiefs lived in ancient times" and a "battle field," "thickly populated." The article summarizes:

> There were two important things concerning this place. (1) This place was entirely deserted and left uninhabited and it seems that this happened before the coming of righteousness to Hawai'i Nei. Not an inhabitant is left. (2) The descendants of the people of this place were so mixed that they were all of one class. Here the gods became tired and returned to Kahiki [*Ka Loea Kālai'āina*, July 8, 1899, translated in Sterling and Summers 1978:33].

McAllister recorded three sites in this area, two *heiau* (134, 137) (Pu'u Kuina and Pu'uku'ua, both destroyed) and a series of enclosures in Kukuilua which he called "kuleana sites" (McAllister 1933). On the opposite side of the Wai'anae range, along the trail to Pōhākea Pass, Cordy (2002:36) states "Kākuihihewa was said to have built (or rebuilt) Nōi'ula, a *pō'okanaka heiau* (1,300 sq. m.) in Hālona in upper Lualualei, along the trail to Pōhākea Pass leading into 'Ewa, ca. A.D. 1640-1660" (Cordy 2002:36). There is no direct archaeological evidence available to the authors' knowledge that intensive Hawaiian settlement occurred here, but it is considered as a place of high probability, based on the above indications. John Papa 'Ī'ī (1959)

described a journey that Liholiho took which led him and an entourage through inland Honouliuli and over Pōhākea Pass. Geographically, the area receives sufficient quantities of water and would have had abundant locally available forest resources.

4.3.5 Summary

On the basis of archaeological studies, informed by historic records, the following may be concluded:

1) There are three areas of Hawaiian settlement in the *ahupua'a*; two are well-documented and one is problematic:
   a. the extensive limestone plain with recurrent use habitations for fishermen and gatherers and sometime gardeners;
   b. the rich cultivated lands of Honouliuli 'ili for extensive wetland taro and clearly the *ahupua'a* population center; and,
   c. the uplands around Pu'uku'ua associated with *kauwā* residence but probably used for agriculture and forest resources.

2) Honouliuli is designed as a unit to contain all the geographic elements of a typical Hawaiian valley *ahupua'a*, except they are arranged geomorphically in an atypical relationship. The *ahupua'a* is not organized around a single drainage network but shares the west portions of Waikele drainage in its upper reaches. A typical and highly advantageous characteristic for human subsistence is included in a vast coastline and fringing reef, an extensive limestone plain which would support only limited agriculture but would be excellent for bird catching in early times, and a huge expanse of sloping forest land. The richest forest land for foraging for wood, birds, feathers, etc. would have been the east slope of the Wai'anae Range. The surveys by Bordner and Silva (1983) and Hammatt and Shideler (1999) at Waimānalo Gulch indicated no evidence of Hawaiian occupation, but the gulch has been impacted in modern times.

3) The *makai* slope was not a major thoroughfare. We can see some very limited evidence of part-time agriculture in and around gulches and two foci of sparse habitation. The first is limited to *makai* portions of gulches and lava flats. This habitation is considered a *mauka* component or continuing of the Ko'ōlina coastal settlement rather than an independent focus. The second focus, separated from the first by a barren zone, is generally above the 800-foot elevation. This *mauka* habitation which could have been supported by seasonal dry land planting and forest foraging may be the lower portion of a thinly scattered, but widespread zone of settlement which stretches eastward and northeast along the east Wai'anae Range slopes and may increase in intensity along the more watered lands forming the *mauka* western boundary of Honouliuli.

4) There is to date no archaeological evidence of high status residence in Honouliuli. Large residential structures are not present along the Pacific shoreline where they would be expected. The late prehistoric occurrence of chiefs' houses is not apparent, perhaps because the ocean shoreline, although rich in marine resources, is uninviting for sport and

unsuitable for fishponds. The chiefly focus of 'Ewa District was Waipi'o. Whatever activities of this class occurred in Honouliuli would have been in or near the rich lands fronting West Loch (the *'ili* of Honouliuli). Concerning status associations with Honouliuli, it is interesting to note the connection of the Pu'uku'ua settlement with slaves (*kauwā*), the lowest class of Hawaiians (Sterling and Summers 1978:33).

5) The focus of population and agriculture within the *ahupua'a* of Honouliuli was the *'ili* of Honouliuli. There is good reason to assume, given the lack of intensive agricultural resources in other prehistoric times, all other habitation zones were economically and socially co-dependent.

Section 5 Results of Fieldwork

5.1 1990 Survey Findings of the West Loch Bluffs Project Area

In 1990, the southeastern portion of the project area (a 546-acre parcel south of Farrington Highway then called West Loch Bluffs) was surveyed by CSH members (Hammatt and Shideler 1990). Five sites were recorded and given SIHP permanent site numbers (Figures 25-29). In addition, four areas of historical importance were researched. For the recent survey, these five previously identified sites were revisited and notes were made on their current condition. In addition, during the recent inventory survey, backhoe testing was conducted in the four areas identified in the 1990 CSH report as possibly containing important historical deposits or artifacts. Table 4 summarizes the findings of the 1990 survey and Figure 25 shows the location of sites and historically documented areas from the 1990 CSH survey.

Table 4. Sites Previously Identified during the 1990 CSH survey

SIHP 50-80-12-	Description	Function	Age
4344	Plantation infrastructure; 3 pipe features (destroyed sometime between 1990 and 2005)	Sugar cane cultivation and irrigation	Ewa and Oahu Plantation operated from 1890 to 1995
4345	Stone-faced Berm	Ewa Plantation Railroad Berm	The Ewa Plantation Railroad operated from 1890 to 1947
4346	Stone-lined Well & Associated Features	Pumping Station (Northern)	Pre-1928 to present
4347	Stone-lined Well & Associated Features	Pumping Station (Central)	Pre-1928 to present
4348	Stone-lined Well & Associated Features	Pumping Station (Southern)	ca. 1928 to present
No SIHP numbers were assigned to the next four areas since there were no surface remains			
	Land Court Awards (LCAs) in Honouliuli Taro Lands	Habitation and Agriculture	Documented in 1848; surviving to at least 1890 (founding of Ewa Plantation)
	Kapalani Catholic Church	Church, School, Residence; possibly cemetery	Built between 1840 and 1847 and destroyed between 1885 and 1890
	PipeLine Village	Plantation Camp for Portuguese and Puerto Rican workers; also a school and church	Some houses possibly built in 1890; main construction phase of 162 houses from 1906 to 1911; demolished in 1931
	Drivers and Stable Villages	Plantation Camp	Drivers Village probably built between 1900 and 1910; it was moved to a new location (outside the project area) in 1931; Stable Village seems to have consisted of only four houses

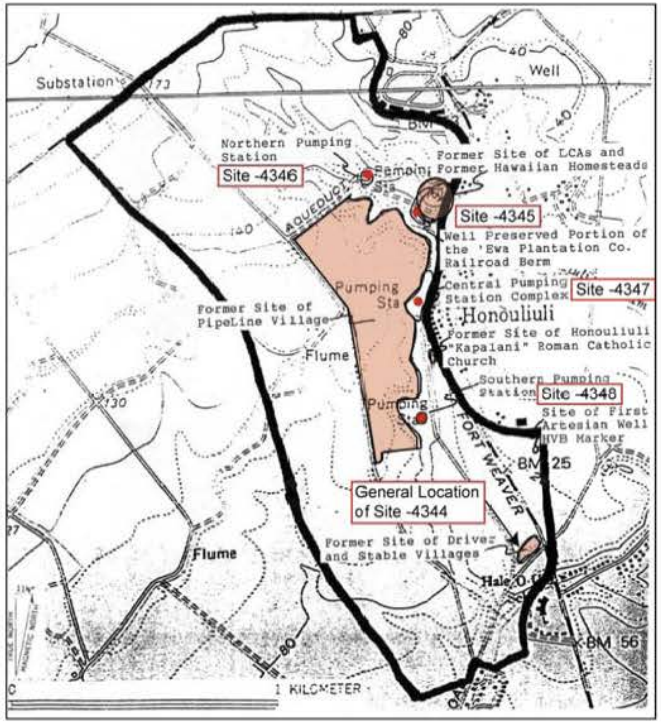

Figure 25. Revised map from 1990 inventory survey report (Hammatt and Shideler 1990), showing location of recorded sites and historically documented areas of concern

Figure 26. Site 50-80-12-4345, Stone-faced berm for Ewa Plantation railroad, view to the north

Figure 27. Site 50-80-12-4346, northern pumping station, view to the northwest

Figure 28. Site 50-80-12-4347, well wall of central pumping station, view to the north

Figure 29. Site 50-80-12-4348, interior well of southern pumping station, view to the west

5.1.1 Sites Recorded during the 1990 Survey

There are three pumping stations within the project area, all which feature rectangular stone faced pits 9 m deep. The northern two (but not the southern one) appear on the 1927/28 USGS map. The southern one was built before 1946. A photo (Bishop Museum Visual Collection) dated 1923 shows what appears to be a brand new "Riedlier Steam Pump Driven by Triple Expansion Corlis Engine" in one of these large stone-faced rectangular wells.

An important part of life within the camps of the project area was the Ewa Plantation Company Railroad, which operated from 1890-1947. Near its peak in 1931, the Plantation Railway system included 18.95 miles of 36" gauge permanent track, 8 miles of portable track, seven oil-burning Baldwin locomotives, and 705 cars (Condé and Best 1974:283). Permanent rail lines ran from the southwest to the northeast up through the middle of the project area along the present can-haul road alignment and also near the eastern margin of the project area. In 1947, the rails were sold for scrap.

During the subsequent decades of the twentieth century, sugar cane operations in 'Ewa phased out and, more recently, former cane lands have been rezoned for residential development. Structures in the area of the former plantation villages have fallen into disrepair or have been demolished. However, portions of the area - including Varona Village, Tenney Village, and Renton Village - have been designated the 'Ewa Villages Historic District (State site 50-80-12-9786), which has been nominated for National Historic Landmark status. Additionally, the still-extant OR&L rail line through Honouliuli has been placed on the National Register of Historic Places (Site 50-80-12-9714).

5.1.1.1 Ewa Plantation Infrastructure (Site 50-80-12-4344)

In the immediate vicinity of the site of Drivers and Stable Villages, the 1990 CSH survey found three iron pipe features, including a tall metal post and two welded pipe constructions. These were collectively given SIHP number 50-80-12-4344, because they were tangible features, which by appearance and location, appeared to be more than 50 years old. The significance of these constructions is thought to exist only in so far as further determination of their age and function elucidate out record of Ewa Plantation life. During the recent CSH 2005 inventory survey, these features could not be refound; the area of their former location had been bulldozed and they had been destroyed.

5.1.1.2 Ewa Plantation Railroad (Site 50-80-12-4345)

The Ewa Plantation Co. ran a private railroad for the primary purpose of hauling cane; it included nearly 30 miles of permanent track. The railroad operated from 1890 to 1947, but most of the permanent track was in place by 1910 (Condé and Best 1973:280). It has been the policy of the Historic Sites section of the SHPD to encourage the retention of particularly good section of railroad berm. While many kilometers of permanent track ran through the project area, a particularly good example is only to be found in the northeastern portion of the project area in the mouth of the dry stream valley, in the traditional *'ili* of Maui. This stretch of the Ewa Plantation Railway was given SIHP number 50-80-12-4345. The railroad berm on either side of the valley access road features well-preserved facings commonly 2 m high. It is recommended that if the railroad berm in this area can be incorporated into development plans and preserved,

that this be done. If development plans require the demolition of a portion of this stretch of railroad berm then mitigation should be worked out with the State Historic Preservation Office in advance.

5.1.1.3 Ewa Plantation Pumping Stations (Sites 50-80-12-4346, -4347, and- 4348)

There are three pumping stations within the project area, all of which feature a deep rectangular basalt block, faced wall. The northern two (Sites -4346 and –4347) are thought to pre-date 1928 and the southern well (Site –4348) is thought to date to shortly thereafter. All three are still extant in the project area. The wells are very impressive structures and are of particular importance to the history of 'Ewa. It is recommended that these wells be preserved. If these wells are deemed a hazard or these area are required by development plants, it might be possible to fill, mark, and cover the wells. All three of the site designations for these wells include adjacent structures. In the case of the northernmost (Site –4346) and the southernmost (Site –4348) wells, the adjacent structure is limited to a single pump house, which has an exterior or corrugated sheet metal panel construction. Evaluation of possible historic significance of these structures is beyond our area of expertise, and it is recommended that issues of significance and proper historic documentation be resolved with the SHPD office in advance of any development of these areas to avoid adverse impacts.

The case of the Central Pump house (Site –4347) is more complicated, in that there are eight features related to the well. In addition, there are a number of small architectural and/or industrial features in the immediate vicinity of the well. In some cases, the age and exact function of these features in unclear. We recommend preservation of at least portions of this site. The significance of the area of Site –4347 would be evaluated after an assessment of the significance of its architectural features and the assessment of the significance of the Ewa Village area. If development of this area is desired, mitigation should be discussed with the SHPD Office.

5.1.2 Historically Documented Areas Identified during the West Loch Bluffs Project

Background research for the West Loch Bluffs report (Hammatt and Shideler 1990) also highlighted four other areas of concern:

5.1.2.1 Hawaiian Land Court Awards in the Honouliuli Taro Lands

An area along the northern portion of Old Fort Weaver Road that was once called the '*ili* of Maui. It contained house sites and taro patches tended by native Hawaiians, according to 1848 Māhele LCA testimony.

A house site (belonging to Pue) is shown on Monsarrat's map of 1878 (see Figure 14), and the presence of several more house sites in this area is clearly indicated in land records circa 1848. It seems very likely that any stones from pre-contact or early historic foundations would have been removed to facilitate cane cultivation and possibly for used in the construction of the adjacent Ewa Plantation railway berm. Is seems highly probably that plowing associated with pre-drip irrigation cane cultivation has badly disturbed sediments to a depth of nearly a meter (36 inches). However, it was thought possible that slope wash from induced erosion had sealed and protected these deposits and had thus insulated these deposits from the impact of subsequent plowing.

There many be intact gravels or other cultural deposits associated with this area. Thus it was recommended in the 1990 survey report that subsurface testing take place in this area before development.

5.1.2.2 Kapalani Catholic Church

There is an area along the southern portion of Old Fort Weaver Road that once had a Roman Catholic Church, shown on the Monsarrat map of 1878 (see Figure 14) as a fenced area enclosing three structures believed to include a church, a school, and a residence. This church (Kapalani Church) was built between 1840 and 1847 and is believed to have been destroyed between 1885 and 1890. From old survey maps, it appears that part or all of the site of the church structure is directly under Old Fort Weaver Road. However, this area is still of archaeological concern for its association with an important person in the history of Hawai'i and because there may be associated historic graves.

It seems highly probable that the Honouliuli Roman Catholic church site within the project area was a major focus of the life of Kahoaliikunaiewakamoku Kepelino (Zepherino) Keauokalani, who is best known by the name Kepelino. Kepelino was a major historian and the author of four fascicles that appeared from 1858-1860, called Hooiliili Hawaii "Hawaiian Collection" and his Mo'olelo Hawaii "Traditions of Hawaii" in 1868 (Valeri 1985:xxv-xxvi). He is of particular importance because he came from a family of high priests, he was a grandson of Kamehameha, he was Queens Emma's secretary, and he was the only major Hawaiian historic of the time who was not a pupil of the Lahainaluna School. Letters to Catholic newspapers dated 1860-1869, under the name Z. Kahoali'i place him in Honouliuli, and it seems probable that he lived in Honouliuli from 1851 into the 1870s. As he was known as an ardent Catholic and a school teacher, it seems likely that he taught for many years at the school within the Roman Catholic Church compound at Honouliuli (now covered by Old Fort Weaver Road).

Another issue regarding the Roman Catholic Church site area is that of graves. A history of the Roman Catholic Church in Hawai'i (Schoofs 1978:110) reports that, after the abandonment of the church, "in 1891 Honouliuli was still important enough to acquire its own Catholic cemetery." We know of only on Roman Catholic Church property in Honouliuli, and that is the church property within and adjacent to the project area. It is possible, therefore, that this cemetery was adjacent or on these church grounds. While the site of the Honouliuli church has been under sugar cane cultivation for many decades, the 36-inch plow zone many not have disturbed any historic interments, if present. Because no trace of this church was found on the surface during the CSH 1990 survey, no site number was given, however, additional background research into this church and subsurface backhoe testing before any development was recommended (Hammatt and Shideler 1990:55).

5.1.2.3 Ewa Plantation PipeLine Village

PipeLine Village was a substantial community including 162 houses (some duplexes), a school, and a church. PipeLine Village was also known as Spanish Camp because its residents were largely of Puerto Rican and Portuguese ancestry. Most of the structures in PipeLine Village are believed to have been built between 1906 and 1911, but it seems highly probably that there were a few older structures, possibly including some of the oldest structures of Ewa Plantation, dating to 1890. The village is believed to have been completely demolished in 1931.

All of the many photos of PipeLine Village houses (Figure 30, Figure 31, Figure 32, and Figure 33) show house foundations consisting of wood posts resting on small light colored blocks (tofu block construction). Thus, there would be virtually no trace of a building footprint after the building was dismantled. The only archaeological remains associated with this village that would be likely to survive 60 years of subsequent cane cultivation would probably be related to the privies, which were typically detached outhouses. If these were pit privies, there should be more than 160 discernible pits with associated durable artifacts, which might include bottles, coins, and personal effects. Some plantation privies had detachable compartments, which would be periodically emptied. If this type of privy was utilized, there would probably be no trace left. It is believed that refuse collection was highly organized by the plantation from early times and this disposal was outside of the present project area. There could however, be small trash pits.

The Ewa Plantation Company Annual Report for 1923 states that "coral roads were laid through villages" and it may well be that the grid of streets shown on the 1928 USGS map could be determined on the ground once the cane was cleared. There are also photos of Portuguese bread ovens (*forno*), which appear to be constructed of brick and plaster, but these were probably all demolished and completely removed. There may have been building slabs or other more durable features to the schoolhouse and church, but there are believed to have been bulldozed as well. It is anticipated that with the possible exception of privy pits and associated artifacts, that the thoroughness of demolition, the light nature of construction, and the sixty years of continuous cane cultivation would have removed almost all other traces of PipeLine Village.

Subsurface reconnaissance of the site of PipeLine Village was recommend in this area for the purpose of gaining further data regarding the layout of the village and for the recovery of artifacts, which might be useful in the study of ethnicity and the interpretation of Ewa Plantation village life. In the absence of any identifiable intact surface cultural features, no site number during the 1990 CSH survey was given to the former site of PipeLine Village.

5.1.2.4 Drivers and Stable Villages

Drivers Village and Stable Village were small communities previously located in the southeastern corner of the project area. Little is known about these villages. A 1931 Ewa Plantation Report states "The Drivers Village, located near the main stables was in such a bad location that it was decided to move all the fourteen cottages . . ." It seems highly probable that Drivers Village consisted of the fourteen structures shown on the 1928 map, that it was constructed between 1900 and 1910 and that it was moved in 1931. Stable Village seems to refer to the few structures just across the street to the south. As with PipeLine Village, the 1990 CSH report recommended reconnaissance after the removal of sugar cane and subsurface testing for the purpose of gaining further data regarding the layout of the village and the recovery of artifacts, which might be useful in the study of ethnicity and in the interpretation of Ewa Plantation village life. No site number were assigned to these village in the absence of any tangible clearly-related remains.

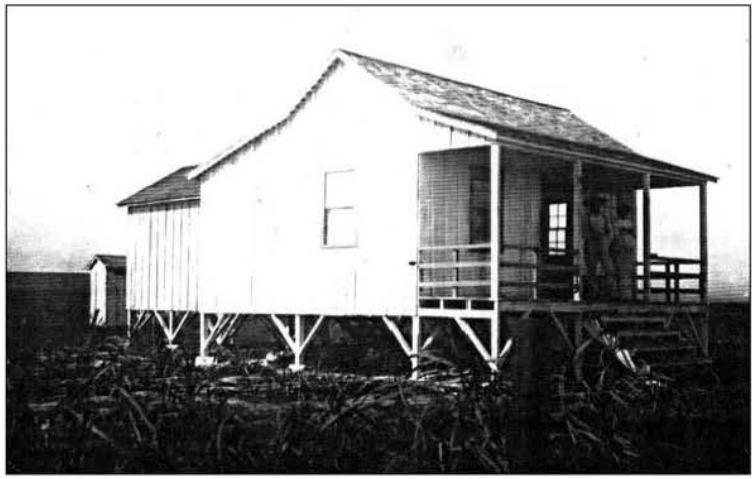

Figure 30. 1907 photograph of residence at PipeLine Village

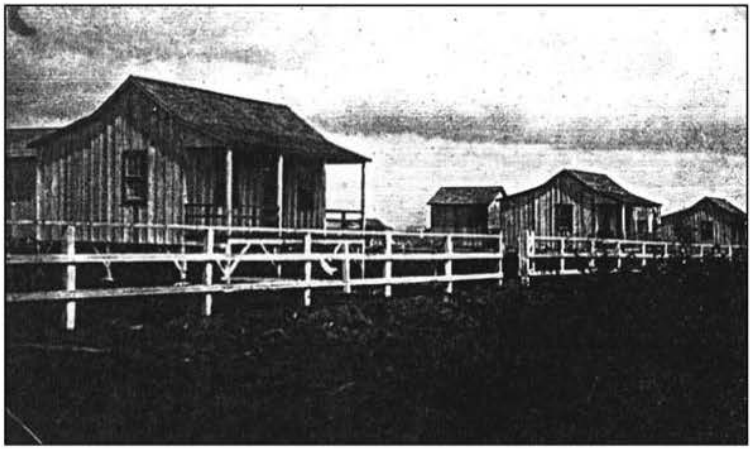

Figure 31. Undated photo of PipeLine Village, showing rows of houses

Figure 32. 1910 photograph of Puerto Rican family in PipeLine Village

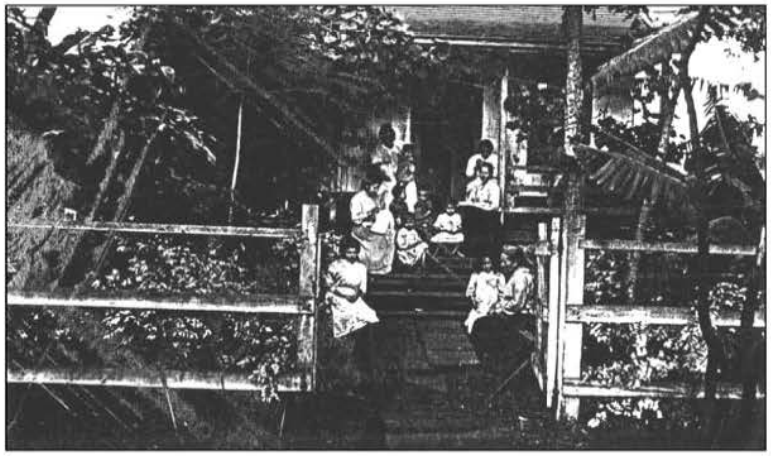

Figure 33. 1907 photograph of Portuguese family at PipeLine Village

5.2 2005 Surface Inventory Survey Findings

A surface pedestrian survey was conducted in the main project area on November 21 and 22, 2005 and January 13, 2006. Approximately 75% of the project area consists of plowed fields with low vegetation (pumpkins, squash and other ground vegetables). All roads surrounding these plowed fields were surveyed by car or by foot. In the southwestern section of the project area (south of Farrington Highway), only a linear corridor along an irrigation ditch had some (natural) weedy vegetation. This area was surveyed by foot. The southeastern section of the project area is a 546-acre parcel that was previously surveyed by CSH in 1990. Those areas with previously identified sites and areas selected for backhoe testing were revisited and additional notes were taken on the present condition of sites and areas. In the northern section of the project area (between I H-1 and Farrington Highway), larger sections of the project area were traversed on foot. Both banks of the Honouliuli Gulch were surveyed, the entire project area east of the gulch was surveyed, and a small weedy area in the northwestern corner of the project area was surveyed. The remaining portions of the main project area are plowed fields planted in crops or land covered with farm buildings.

Two non-contiguous parcels were surveyed by foot on January 13, 2006. The southern parcel (TMK 9-1-010:002) consisted of a triangular area bounded by a residential area, the West Loch Estates, on the west and Plantation Road on the west and south. The east side is bounded by the proposed 'Ewa Gentry Drainage Ditch, which was surveyed in 1993 (Pantaleo and Sinoto 1993). It is bisected by Arizona Road. The section south of Arizona Road is plowed fields; the northern section is covered with low grass and *koa haole* trees; the ground is extremely hummocky, as if it has been recently bulldozed (see Figure 5). Based on historic maps, Pantaleo and Sinoto (1993) thought they might find the remains of a portion of the OR&L track and sugar cane irrigation flumes in their project area. They found part of the OR&L roadbed berm, and also found the remains of metal flumes and concrete culverts, but these had been bulldozed into piles near the West Loch shoreline. These remains were not considered significant due to the absence of structural and locational integrity. During the recent CSH survey of the area, only a few concrete culverts, bulldozed into a ditch along the western border of the parcel, were found. The northern non-contiguous parcel (TMK 9-2-002:004, 005) surrounds a reservoir north of the H-1 Interstate. This area has also been extensively bulldozed; the reservoir has been filled (is level with the surrounding ground) and a berm has been constructed around the former rim. There were no structural remains found in this area.

Four new features were recently identified in the project area. All four were found in the northern portion of the main project area along Honouliuli Gulch (Figure 34 and Figure 35). During the 1990 inventory survey of the West Loch Bluffs (southeastern 546-acre parcel), three sugar cane plantation infrastructure features (three pipe features) were grouped into Site 50-80-12-4344. Since all four new features found during the recent 2005 inventory survey are also related to sugar cane plantation infrastructure, these features have been subsumed into the same site designation. In this portion of the project area, Honouliuli Stream extends generally from the northwest to the southeast, but one portion is oriented east-west.

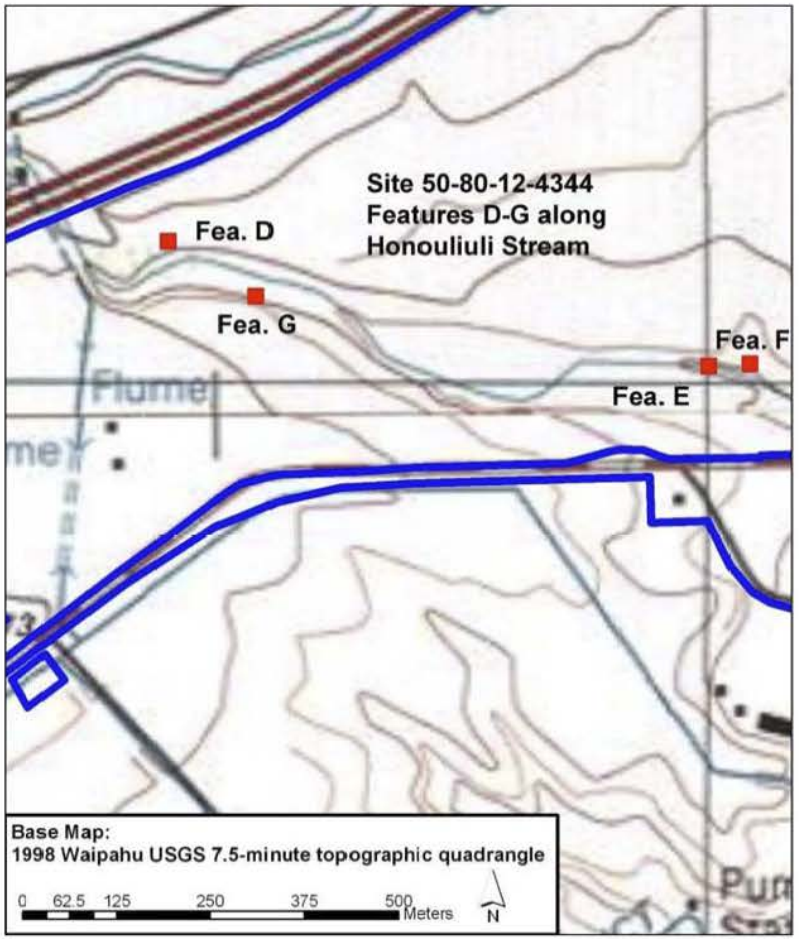

Figure 34. US Geological Survey map, showing location of Features D-F of Site 50-80-12-4344 along Honouliuli Stream

Figure 35. Typical vegetation in Honouliuli Gulch, view to the south

Site 50-80-12-4344, Features D-G

Feature D is a linear wall built against (parallel) to the east (or north) bank of Honouliuli Gulch (Figure 36 and Figure 37). It is 16 m long, 90 cm wide, 1.1 m high, and is oriented at a 77/277° angle. The wall is at the rim of the gulch. It is constructed of subangular basalt cobbles and boulders, 30-60 cm in diameter, stacked five to six courses high. One side abuts the gulch rim and the other side is faced; in some cases, the rocks have been split with metal tools, so that the outer side has a vertical face. Based on the location and construction, the wall functioned for erosion control.

Feature E is a linear wall on the west (or south) bank of Honouliuli Stream (Figure 38 and Figure 39). It is built perpendicular to the orientation of the gulch and is built on a slightly sloping terrace area near the top rim of the gulch. The wall is 4.5 m high, 55 cm wide, and 50 cm high. It is a core-filled wall, with basalt boulders 30-60 cm in diameter on the sides, and smaller cobbles in the interior. The function is unknown, but core-filled walls are usually historic in age. Its location near Honouliuli Gulch suggests it functioned for water or erosion control.

Feature F is a stone-faced berm on the west (south) bank of Honouliuli Stream at the top of the gulch rim (Figure 40 and Figure 41). It is constructed perpendicular to the orientation of the stream. The berm is faced with stones (some cut with metal tools to make a vertical face) on the northern side, stacked 6 to 8 courses high. The wall is not vertical, but slopes outward at the base. The construction is somewhat unusual in that the largest stones (up to 70 cm in diameter) are placed in the middle courses, not at the base, as is usual. The top of the berm is not particularly even and slopes down towards the gulch. The construction of this berm suggests it was constructed as some type of loading area, so that some type of vehicle could be parked or structure could be constructed on top of the berm, possible for loading or storing sugar cane or water.

Feature G consists of a concrete ditch and a concrete masonry catchment basement on the west (or south) bank of Honouliuli Gulch (Figure 42 and Figure 43). A metal pipe at the base of the flume and basin extends underground towards Honouliuli Gulch down a 45° slope at a due north/south orientation. The ditch is rectangular and 5.5 m long, 40 cm wide and 30 cm deep. The top of the ditch is covered with concrete slab lids, 90 cm long, 40 cm wide and 7 cm thick. The ditch itself is made with separate Waialua-type modal concrete units, which were made at the Ewa Plantation for their irrigation projects. The basin is C-shaped, constructed of rocks and mortar. The basin is 1.35 m long north/south, 1.3 m wide, 90 cm deep, with walls 28 cm thick. The outer side has an inset area that may once have had some type of sign or plaque. The ditch was used for irrigation or water control by the Ewa Plantation Company.

Figure 36. Feature D, Linear Wall abutting gulch rim, view to the north (upslope)

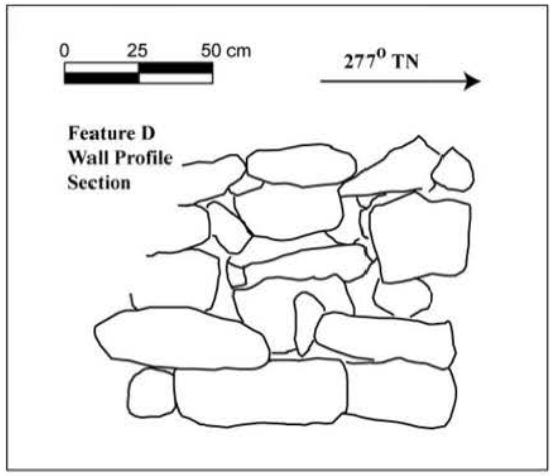

Figure 37. Feature D, Linear Wall, profile of 1.0 meter section

Figure 38. Feature E, Linear Wall, built perpendicular to orientation of Honouliuli Gulch, view to the east (upslope)

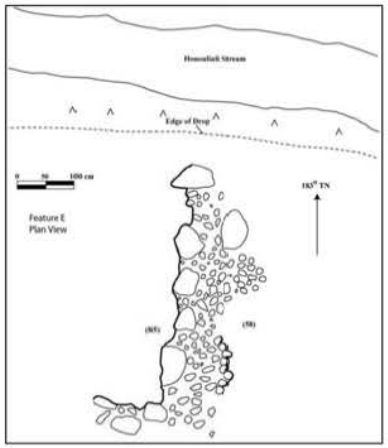

Figure 39. Feature E, Linear Wall, plan view

Figure 40. Feature F, Stone-faced berm, built perpendicular to orientation of Honouliuli Stream, view to the west (downlsope)

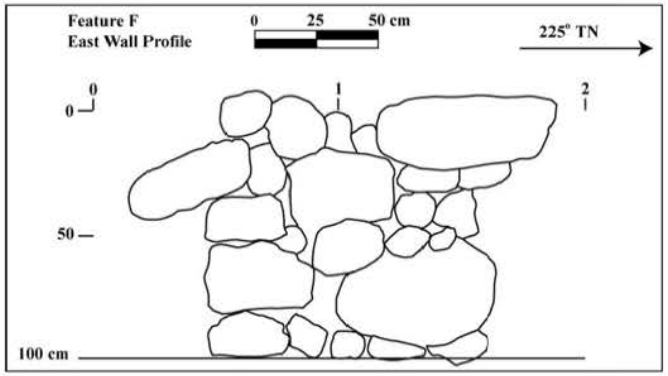

Figure 41. Feature F, Linear Wall of Berm, profile of 1.0 m faced wall section

Figure 42. Feature G, concrete ditch, view to the west (upslope)

Figure 43. Feature G basin, showing steel pipe extending downslope to Honouliuli Stream, view to the south

5.3 2005 Backhoe Test Excavations Findings

Backhoe testing was conducted in four selected portions of the project area on November 28 and December 7 and 8, 2005. A total of 19 trenches were excavated in the project area in four specific areas (see Figures 44 and 45), the Honouliuli Taro Lands (5 trenches) adjacent to the northern portion of Old Fort Weaver Road, the probable location of the Kapalani Catholic Church (7 trenches) adjacent to the southern portion of Old Fort Weaver Road, the former site of Drivers and Stable Villages (1 trench) near the southeastern corner of the project area, and the former site of PipeLine Village (6 trenches) in the south-central section of the project area.

5.3.1 Roman Catholic Churchyard

Seven trenches (BHT 1-6, BHT 19) were excavated around the probable site of the Roman Catholic churchyard. As noted previously, a comparison of modern and nineteenth century maps indicates that the church building itself was once located under the present alignment of Old Fort Weaver Road. Only a small portion of the churchyard extended on the west side of the present road. There are fenced-in fields in this portion of the project area where staked beans are planted. There is only a small portion of open ground between this fenced-in area and a tall berm along the road. The seven trenches were placed around the sides of the fenced field and between the fields and the road berm. No shaped stones, mortar, cultural layers, or artifacts were found in any of the seven trenches.

Trenches 1-3, on the north side of the bean field, had complex stratigraphies with several silty loam or silty clay layers, probably deposited during flooding episodes. An old roadbed was present as the upper stratum of Trenches 4, 5, 6, and 19 (along the east side of the field adjacent to Old Fort Weaver Road). This is probably the old alignment of Fort Weaver Road, thus the yard of the Roman Catholic Road was probably located east of our trench placement. Either it was located under the present alignment of Old Fort Weaver Road, under the shoulder of the road, or under the earth berm adjacent to the road shoulder. Trench 4 had modern black plastic fragments (used for weed control in the gardens) at a depth of 210 cm. Another trench (Trench 3) had coral cobbles or boulders at depths of 150 cmbs, indicating a significant amount of soil disturbance in these trenches adjacent to the road.

Stratigraphic profiles and some photographs for these seven trenches are illustrated in Figure 46 to Figure 56, with the stratigraphic soil descriptions following.

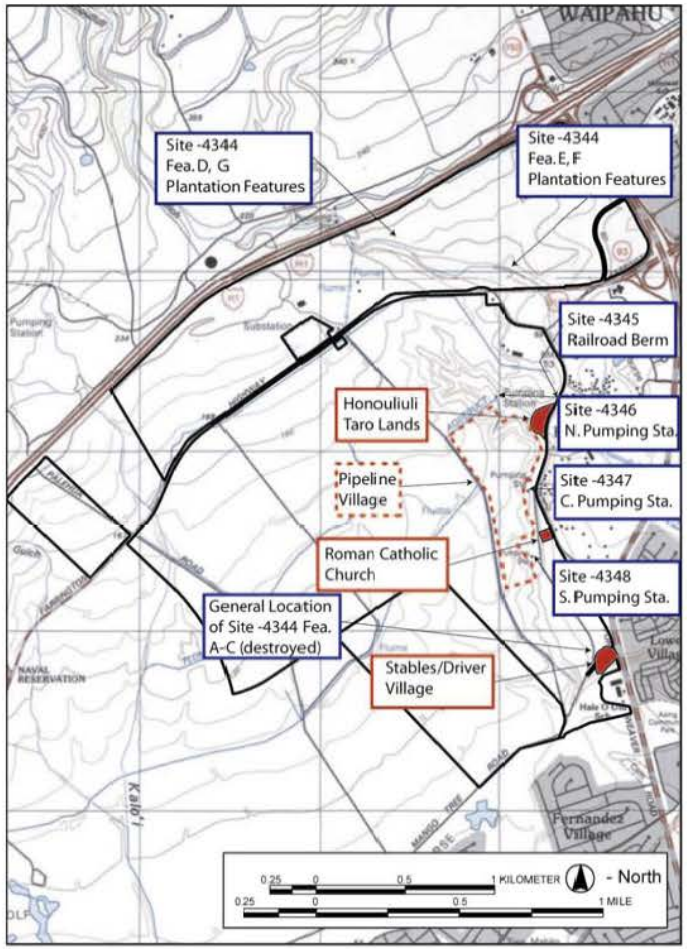

Figure 44. US Geological Survey map, showing four areas selected for backhoe testing and location of five recorded sites

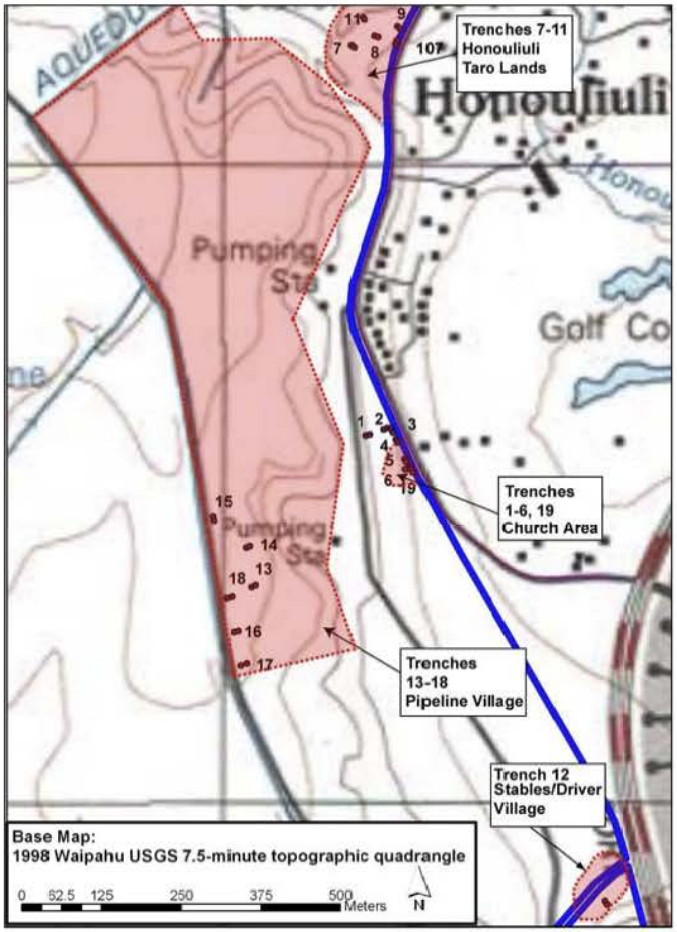

Figure 45. US Geological Survey map, showing location of Backhoe Trenches 1-19; red shaded areas show former locations of Honouliuli Taro Lands, Roman Catholic Church, Stables/Driver Village, and Pipeline Village

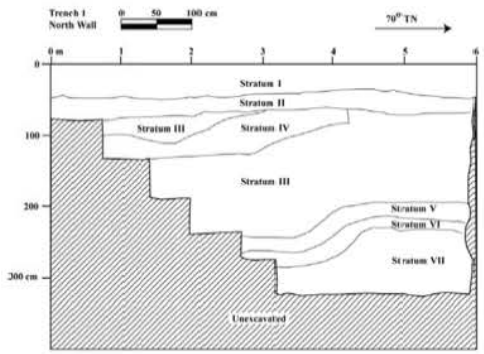

Figure 46. Backhoe Trench 1, north wall profile

Backhoe Trench 1
Stratum-Depth

I	0-60 cmbs	Very dark grayish brown (10YR3/2) silty clay loam; weak, fine, subangular blocky structure; very firm when moist, very sticky and moderately plastic consistence; terrestrial origin; abrupt, smooth boundary;
II	60-70 cmbs	Brown (10YR4/3) silty clay loam; moderate, medium subangular blocky structure; very hard when dry, slightly sticky and slightly plastic consistence; terrestrial origin; abrupt, smooth boundary;
III	60-240 cmbs	Very dark gray (10YR3/1) clay loam; strong, coarse, angular blocky structure; extremely hard when moist, slightly sticky and slightly plastic consistence; terrestrial origin; very abrupt, wavy boundary;
IV	65-120 cmbs	Gray (10YR6/1) ashy silt; structureless; slightly hard when moist; very sticky and slightly plastic consistence; terrestrial origin; abrupt, wavy boundary; stratum is between two Stratum III layers;
V	240-260 cmbs	Dark yellowish brown (10YR3/4) silty loam; structureless; loose when moist; slightly sticky and moderately plastic; terrestrial origin; very abrupt, wavy boundary;
VI	260-290 cmbs	Dark reddish brown (5YR3/2) silty loam; structureless; soft when dry, slightly sticky and moderately plastic; terrestrial origin; very abrupt, wavy boundary;
VII	290-330+ cmbs	Dark brown (10YR3/3) silty clay; moderate, medium angular blocky structure; hard when dry, slightly sticky and plastic; terrestrial origin; excavation arbitrarily terminated at 330 cmbs.

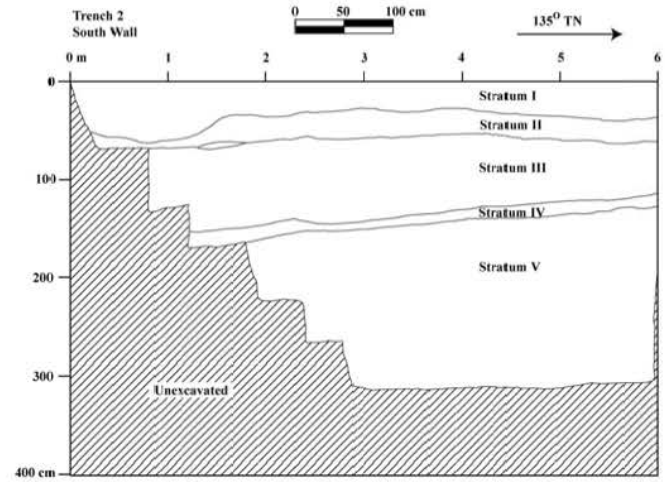

Figure 47. Backhoe Trench 2, south wall profile

Backhoe Trench 2
Stratum-Depth

I	0-25 cmbs	Very dark grayish brown (10YR3/2) silty clay loam; moderate, medium, subangular blocky structure; very firm when moist, very sticky and moderately plastic consistence; terrestrial origin; extensive charcoal flecking; abrupt, wavy boundary;
II	25-53 cmbs	Dark brown (7.5YR3/2) clay loam; moderate, medium subangular blocky structure; friable when moist, sticky and moderately plastic consistence; terrestrial origin; clear, smooth boundary;
III	53-140 cmbs	Very dark gray (10YR3/1) clay loam; strong, coarse, angular blocky structure; extremely hard when moist, sticky and slightly plastic consistence; terrestrial origin; very abrupt, wavy boundary;
IV	140-147 cmbs	Gray (10YR6/1) ashy silt; structureless; slightly hard when moist; very sticky and slightly plastic consistence; terrestrial origin; abrupt, wavy boundary;
V	147-310+ cmbs	Dark yellowish brown (10YR3/4) silty loam; structureless; loose when moist; slightly sticky and moderately plastic; terrestrial origin; excavation arbitrarily terminated at 310 cmbs.

Figure 48. Backhoe Trench 1 photo, south wall profile

Figure 49. Backhoe Trench 2 photo,view to the east

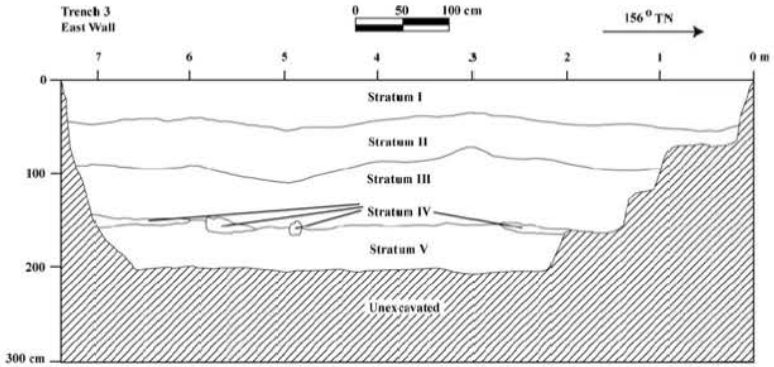

Figure 50. Backhoe Trench 3, north wall profile

Backhoe Trench 3
Stratum-Depth

I	0-41 cmbs	Very dark grayish brown (10YR3/2) silty clay loam with 90% gravel (old road bed); moderate, medium subangular blocky structure; very firm when moist, sticky and moderately plastic consistence; terrestrial origin; abrupt, smooth boundary;
II	40-85 cmbs	Dark brown (7.5YR3/2) clay loam; moderate, medium subangular blocky structure; friable when moist, sticky and moderately plastic consistence; terrestrial origin; abrupt, wavy boundary;
III	85-155 cmbs	Dark yellowish brown (10YR4/4) silty clay loam; moderate, medium structure; friable when moist, sticky and plastic; very abrupt, irregular boundary;
IV	145-162 cmbs	Gray (10YR6/1) ashy silt; structureless; slightly hard when moist; very sticky and slightly plastic consistence; terrestrial origin; abrupt, wavy boundary, several large coral borders at boundary;
V	155-200+ cmbs	Dark yellowish brown (10YR3/4) silty loam with 25% coral cobbles; structureless; loose when moist; slightly sticky and moderately plastic; terrestrial origin; excavation arbitrarily terminated at 200 cmbs.

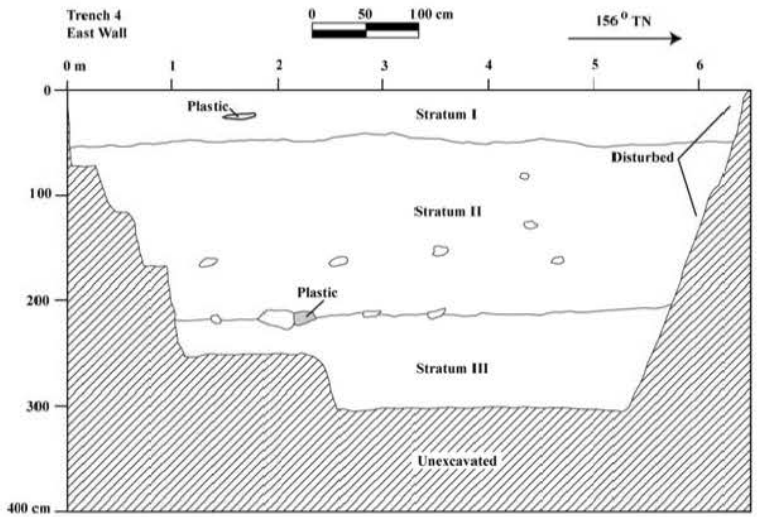

Figure 51. Backhoe Trench 4, north wall profile

Backhoe Trench 4
Stratum--Depth

I	0-48 cmbs	Very dark grayish brown (10YR3/2) silty clay loam with 25% gravel (old road bed); moderate, medium subangular blocky structure; very firm when moist, sticky and moderately plastic consistence; terrestrial origin; abrupt, smooth boundary;
II	40-210 cmbs	Dark brown (7.5YR3/2) clay loam; moderate, medium subangular blocky structure; friable when moist, sticky and moderately plastic consistence; terrestrial origin; scattered coral cobbles; abrupt, wavy boundary, modern plastic found at II/III interface at 210 cmbs;
III	210-300+ cmbs	Dark yellowish brown (10YR3/4) silty loam with 25% coral cobbles; structureless; loose when moist; slightly sticky and moderately plastic; terrestrial origin; excavation arbitrarily terminated at 300 cmbs.

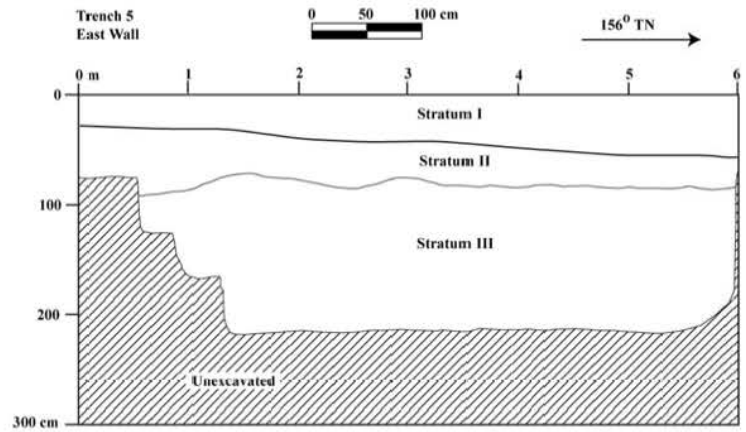

Figure 52. Backhoe Trench 5, east wall profile

Backhoe Trench 5
Stratum--Depth

I	0-50 cmbs	Old asphalt fragments;
II	50-82 cmbs	Very dark grayish brown (10YR3/2) clay loam with 1% basalt cobbles; moderate, medium angular blocky structure; extremely hard when dry, sticky and plastic consistence; terrestrial origin; diffuse, wavy boundary;
III	82-213+ cmbs	Dark brown (10YR3/3) silty clay loam; weak, fine subangular blocky structure; hard when dry, sticky and moderately plastic consistence; terrestrial origin; excavation arbitrarily terminated at 213 cmbs.

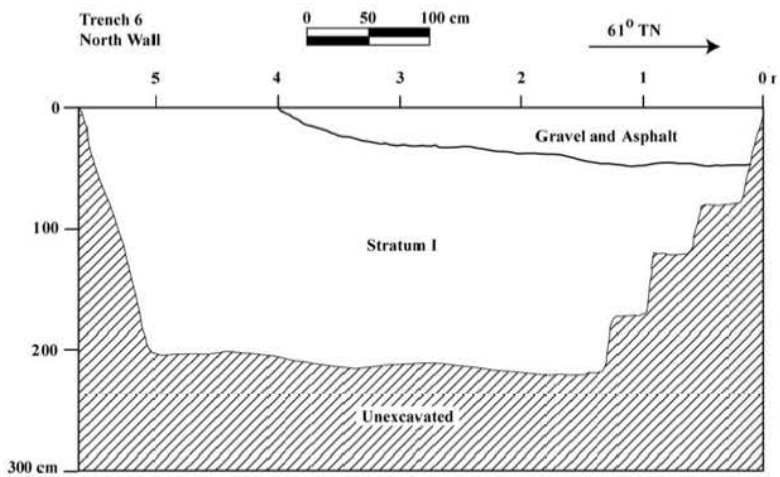

Figure 53. Backhoe Trench 6, north wall profile

Backhoe Trench 6
Stratum-Depth

I	0-48 cmbs	Old asphalt fragments;
II	48-119+ cmbs	Brown (10YR4/3) clay loam; medium moderate subangular blocky structure; moderately firm when moist, sticky and very plastic consistence; terrestrial origin; excavation arbitrarily terminated at 119 cmbs.

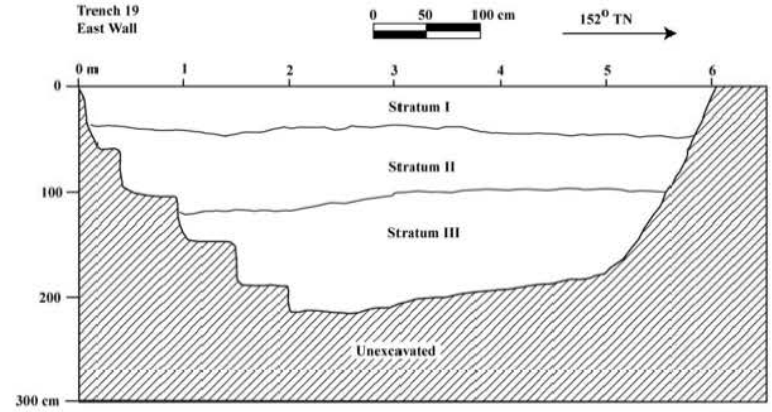

Figure 54. Backhoe Trench 19, east wall profile

Backhoe Trench 19
Stratum--Depth

I	0-48 cmbs	Old asphalt fragments;
II	48-102 cmbs	Very dark grayish brown (10YR3/2) clay loam with 1% basalt cobbles; moderate, medium angular blocky structure; extremely hard when dry, sticky and plastic consistence; terrestrial origin; diffuse, wavy boundary;
III	102-210+ cmbs	Dark brown (10YR3/3) silty clay loam; weak, fine subangular blocky structure; hard when dry, sticky and moderately plastic consistence; terrestrial origin; excavation arbitrarily terminated at 210 cmbs.

Figure 55. Trench 5 photo, east wall profile

Figure 56. Trench 19 photo, east wall profile

5.3.2 Honouliuli Taro Land Trenches

Five trenches (BHT 7-11) were excavated in the Honouliuli Taro Lands area. This portion of the project area was thickly vegetated with low (ca. 1 m tall) *koa haole* trees and larger '*opiuma* (*Pithecellobium dulce*) trees. The area available for backhoe testing was circumscribed by the presence of these larger trees; trenches could only be placed in areas where the smaller *koa haole* trees could be knocked down with the backhoe. There was also a large pit in the southwestern section of this area used for flood control. This area is adjacent and east of the Ewa Plantation Railroad berm (Site 50-80-12-4345).

No shaped stones, cultural layers, '*auwai* (irrigation ditches used in wetland cultivation) organic soils (soils once used for wetland agriculture), walls, habitation platforms, boundary walls or alignments, or artifacts were found in any of the five trenches; however, many of the trenches did contain fragments of limestone mortar, asphalt, and slag to a depth of 1.7 m below surface. One *Tellina* sp. bivalve shell was found at a depth of 150 cmbs, but it was adjacent to a fragment of slag at 170 cmbs, and thus was deposited in modern times (or is in a disturbed stratum). Only one stratum of soil was found in each of the five trenches; some trenches had trash deposits. The disturbed nature of the top stratum may be related to the nearby railroad berm. Stones and even soil may have been moved and excavated from this area to build the earth and rock berm for the railway bed. The presence of limestone mortar, slag, asphalt, and charcoal lenses found in several trenches may also be associated with this berm construction and use.

The stratigraphic profiles (Figure 57 to Figure 65), photographs, and soil descriptions for the five trenches follows.

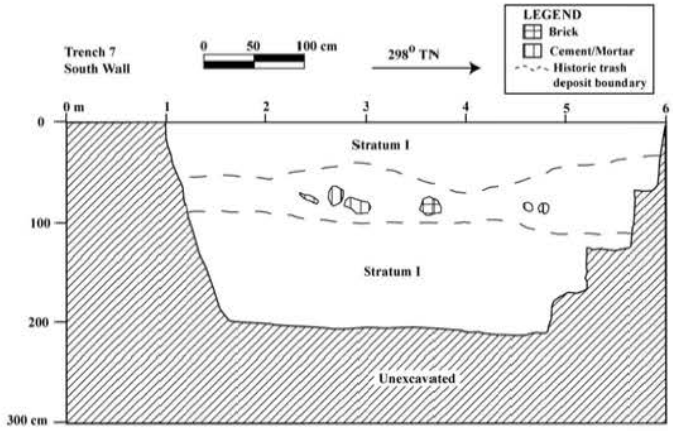

Figure 57. Backhoe Trench 7, south wall profile

Backhoe Trench 7
Stratum-Depth

I	0-210+ cmbs	Very dark brown (7.5YR5/3) silt loam; moderate, medium, subangular blocky structure; slightly hard when moist, non-sticky and non-plastic consistence; terrestrial origin; layer containing brick, cement, and mortar extending within Stratum I from 40-100 cmbs; excavation arbitrarily terminated at 210 cmbs.

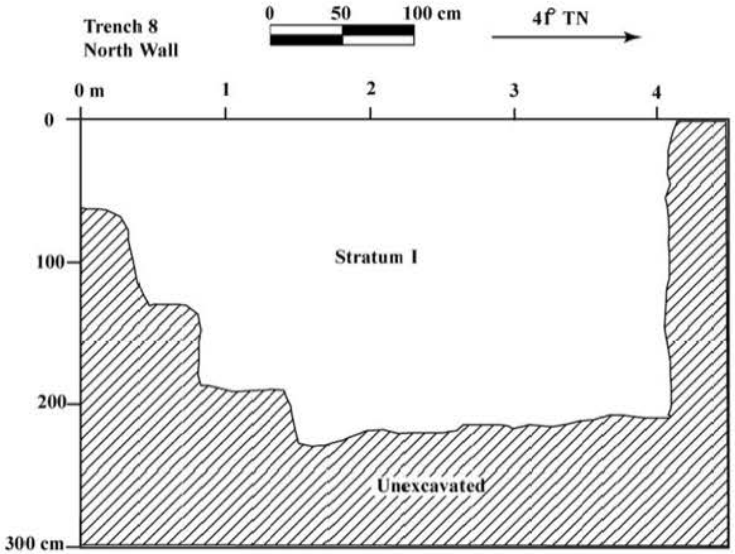

Figure 58. Backhoe Trench 8, north wall profile

Backhoe Trench 8
Stratum-Depth

I	0-230+ cmbs	Very dark brown (7.5YR5/3) silt loam; moderate, medium, subangular blocky structure; slightly hard when moist, non-sticky and non-plastic consistence; terrestrial origin; cement fragments only on surface and top; has slag and decomposing limestone fragments throughout; excavation arbitrarily terminated at 230 cmbs.

Figure 59. Trench 7 photo, south wall profile

Figure 60. Trench 8, north wall profile

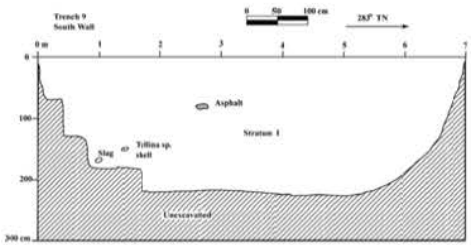

Figure 61. Backhoe Trench 9, south wall profile

Backhoe Trench 9
Stratum- Depth

I 0-227+ cmbs Very dark brown (7.5YR5/3) silt loam; moderate, medium, subangular blocky structure; slightly hard when moist, non-sticky and non-plastic consistence; terrestrial origin; decomposing limestone fragments throughout; *Tellina* sp. marine bivalve shell found at 150 cmbs; slag found at 170 cmbs; excavation arbitrarily terminated at 227 cmbs.

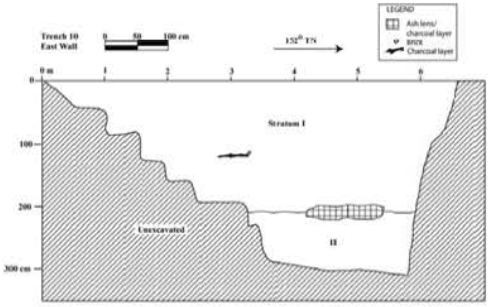

Figure 62. Backhoe Trench 10, east wall profile

Backhoe Trench 10
Stratum-Depth

I 0-305+ cmbs Very dark brown (7.5YR5/3) silt loam; moderate, medium, subangular blocky structure; slightly hard when moist, non-sticky and non-plastic consistence; terrestrial origin; slag, brick fragments, charcoal flecks, and decomposing limestone fragments throughout; charcoal lens at 120 cmbs and ash/charcoal lens at 200-220 cmbs; excavation arbitrarily terminated at 305 cmbs.

Figure 63. Backhoe Trench 9 photo, south wall profile

Figure 64. Backhoe Trench 10 photo, east wall profile

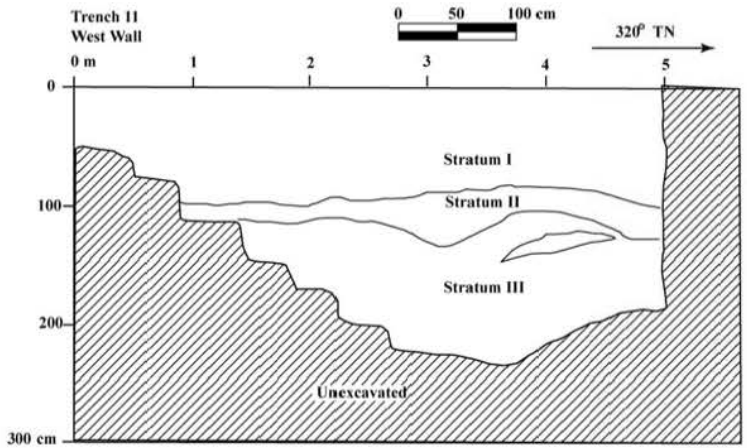

Figure 65. Backhoe Trench 11, west wall profile

Backhoe Trench 11
Stratum-Depth

I	0-88 cmbs	Very dark brown (7.5YR5/3) silt loam; moderate, medium, subangular blocky structure; slightly hard when moist, non-sticky and non-plastic consistence; terrestrial origin; slag, brick fragments, charcoal flecks, and decomposing limestone fragments throughout; clear, wavy boundary;
II	88-110 cmbs	Brown (10YR4/3) silty clay loam; moderate, medium subangular blocky structure; very hard when dry, slightly sticky and slightly plastic consistence; terrestrial origin; abrupt, smooth boundary;
III	110-240+ cmbs	Very dark gray (10YR3/1) clay loam; strong, coarse, angular blocky structure; extremely hard when moist, slightly sticky and slightly plastic consistence; terrestrial origin; excavation arbitrarily terminated at 240 cmbs.

5.3.3 Drivers and Stable Villages

One trench (BHT-12) was excavated in the Drivers/Stable Villages area. In the last ten years, this area has been very susceptible to floods, so much so that when water would come into this area it would wash soil onto Old Fort Weaver Road. To control these floods, the majority of this area had been bulldozed, excavated, and filled with gravel. Only a small portion of this area near the extreme southeastern corner of the project area still had some vegetation and was thought to have been undisturbed by this excavation and filling. The one trench (BHT-12) excavated in this area had two strata, separated by an asphalt layer, possibly an old roadbed. It is unlikely that this road was built for the Drivers/Stable Village, since the name "Stable" suggests that horses and mules were still the predominant method of hauling and travel in this period, not car or tractors. There were no other artifacts or material from the villages indicated by this trench excavation. The stratigraphic profile (Figure 66 and Figure 67) and soil descriptions for Trench 12 are presented below:

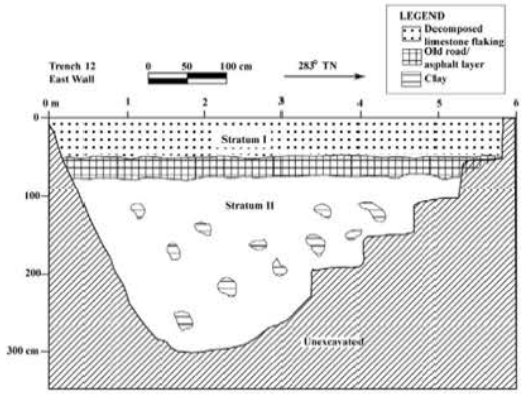

Figure 66. Backhoe Trench 12, east wall profile

Backhoe Trench 12
Stratum-Depth

I	0-50 cmbs	Very dark brown (7.5YR5/3) silt loam; moderate, medium, subangular blocky structure; slightly hard when moist, non-sticky and non-plastic consistence; terrestrial origin; with many small fragments of decomposed limestone; abrupt, smooth, boundary; old road/asphalt bed at 50-70 cmbs;
II	70-300+ cmbs	Dark brown (7.5YR3/4) silty clay loam; strong, medium blocky structure; friable when moist, slightly sticky and plastic consistence;

strong cementation; terrestrial origin; soil intermixed with 50% pockets of clay; excavation arbitrarily terminated at 300 cmbs.

Figure 67. Trench 12 photo, east wall profile

5.3.4 PipeLine Village

Six trenches (BHT-13-18) were excavated in the former location of PipeLine Village. The first trench was placed in the area thought to be the former location of the church shown on the 1927 USGS map (see Figure 19). This section of the project area is flat, open, plowed fields planted in pumpkins and squash. Trenches were placed on roads along the sides and between the plowed fields. The surface and the plow zone had a dense concentration of concrete fragments (less than 20 cm in diameter), especially near the southern section of the project area (near where the church may have been). Two to three strata were found in the six trenches. The concrete fragments were only found on the ground surface or within the loose soil, the top 20 cm of the plow zone. None were found any deeper. No privy pits were found, no food remains, no historic artifacts, and no firepits or other habitation features were found. In conclusion, it seems that when the houses of PipeLine Village were moved in 1931, little remained behind. The concrete fragments are probably fragments of the blocks on which the wooden houses rested, or are part of some of the coral/gravel roads between the house roads. The stratigraphic profiles and photographs for these six trenches (Figure 68 to Figure 77) are presented below, with the soil descriptions following.

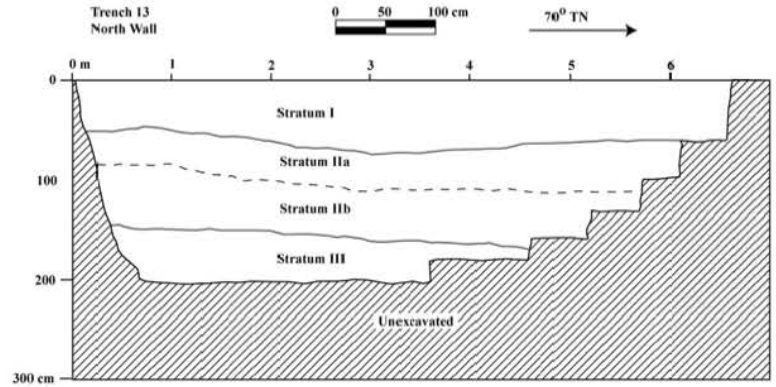

Figure 68. Backhoe Trench 13, north wall profile

Backhoe Trench 13
Stratum-Depth

I	0-60 cmbs	Dark yellowish brown (10YR3/4) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and moderately non-plastic consistence; terrestrial origin; cobble-size concrete fragments found only on the surface and the upper 20 cm of loose soil; abrupt, smooth, boundary;
IIA	60-100 cmbs	Strong brown (7.5YR4/6) sandy loam; moderate, fine, subangular blocky structure; firm when moist, slightly sticky and slightly plastic consistence; terrestrial origin, diffuse, irregular boundary;
IIB	100-150 cmbs	Brown (7.5YR4/3) sandy loam; strong, medium blocky structure; friable when moist, non-sticky and non-plastic consistence; 60% gravel; terrestrial origin; clear, wavy boundary;
III	150-200+cmbs	Brown (7.5YR4/2) clay; weak, very fine prismatic structure; friable when moist, sticky and very plastic consistence; terrestrial origin; excavation arbitrarily terminated at 200 cmbs.

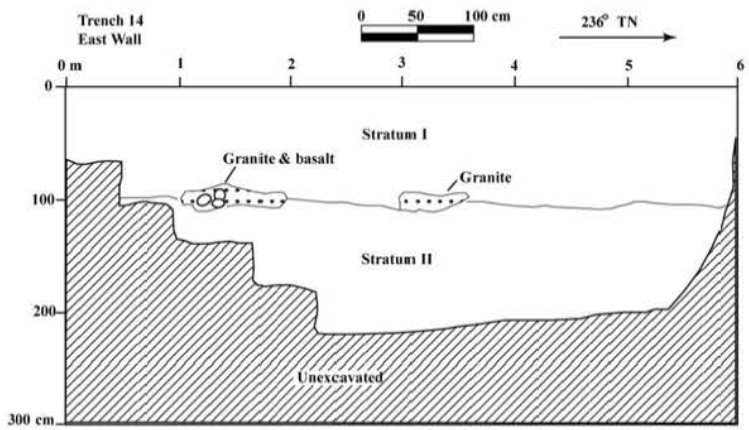

Figure 69. Backhoe Trench 14, east wall profile

Backhoe Trench 14

Stratum-Depth

I	0-110 cmbs	Dark yellowish brown (10YR3/4) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and moderately non-plastic consistence; terrestrial origin; cobble-size concrete fragments found on the surface and the upper 20 cm of loose soil; basalt cobbles and boulders at I/II interface; abrupt, smooth, boundary;
II	110-220+cmbs	Brown (7.5YR4/2) clay; weak, very fine prismatic structure; friable when moist, sticky and very plastic consistence; terrestrial origin; excavation arbitrarily terminated at 220 cmbs.

Figure 70. Backhoe Trench 13 photo, north wall profile

Figure 71. Backhoe Trench 14, east wall profile

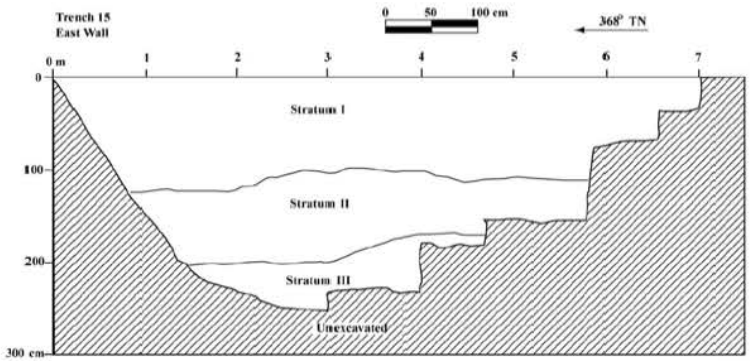

Figure 72. Backhoe Trench 15, east wall profile

Backhoe Trench 15
Stratum-Depth

I	0-98 cmbs	Dark yellowish brown (10YR3/4) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and moderately non-plastic consistence; terrestrial origin; cobble-size concrete fragments found on the surface and the upper 20 cm of loose soil; abrupt, smooth, boundary;
II	90-200 cmbs	Yellowish red (5YR4/6) clay loam (50% clay); moderate, medium, blocky structure; firm when moist; sticky and plastic; strong cementation; terrestrial origin; abrupt, wavy boundary;
III	200-255+ cmbs	Brown (7.5YR4/2) clay; weak, very fine prismatic structure; friable when moist, sticky and very plastic consistence; terrestrial origin; excavation arbitrarily terminated at 255 cmbs.

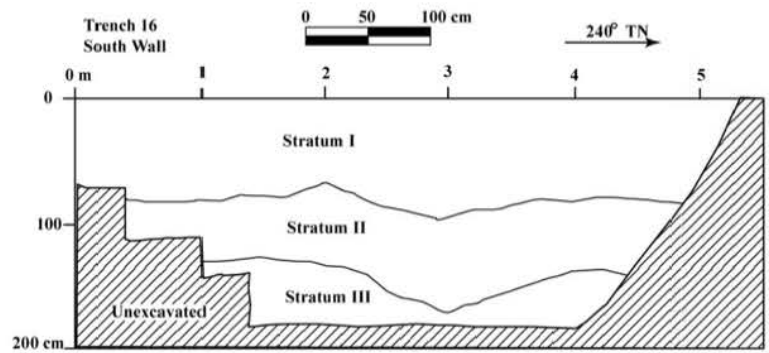

Figure 73. Backhoe Trench 16, south wall profile

Backhoe Trench 16
Stratum-Depth

I	0-100 cmbs	Dark Yellowish Brown (10YR3/4) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky, moderately plastic consistence; terrestrial origin; cobble-size concrete fragments found on the surface and the upper 20 cm of loose soil; abrupt, smooth boundary;
II	100-200 cmbs	Yellowish red (5YR4/6) clay loam; moderate, medium, subangular blocky structure; firm when moist, sticky and plastic consistence; terrestrial origin; abrupt, wavy boundary;
III	200-255+ cmbs	Brown (7.5YR4/2) clay; weak, very fine, platy structure; friable when moist; sticky and very plastic consistence; terrestrial origin; excavation arbitrarily terminated at 255 cmbs.

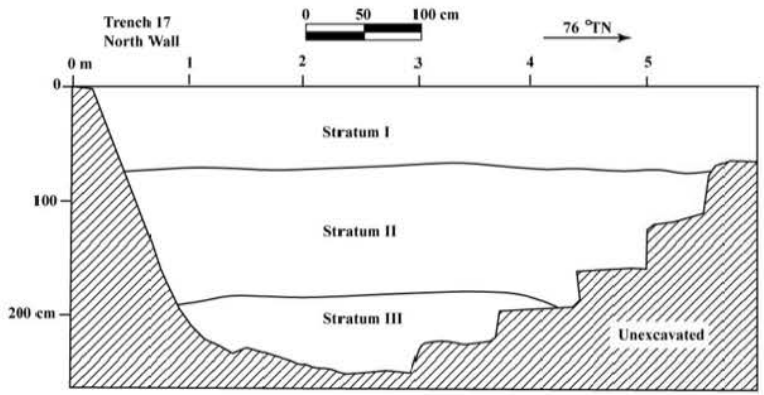

Figure 74. Backhoe Trench 17, north wall profile

Backhoe Trench 17
Stratum-Depth

I	0-41 cmbs	Dark yellowish brown (10YR3/4) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and moderately non-plastic consistence; terrestrial origin; cobble-size concrete fragments found on the surface and the upper 20 cm of loose soil; abrupt, smooth, boundary;
II	41-132 cmbs	Yellowish red (5YR4/6) clay loam (50% clay); moderate, medium, blocky structure; firm when moist; sticky and plastic; strong cementation; terrestrial origin; abrupt, wavy boundary;
III	132-200+ cmbs	Brown (7.5YR3/2) clay loam; weak, medium subangular blocky structure; friable when moist; sticky and slightly plastic consistence; weak cementation; terrestrial origin; excavation arbitrarily terminated at 200 cmbs.

Figure 75. Backhoe Trench 16 photo, view to the east

Figure 76. Trench 17 photo, north wall profile

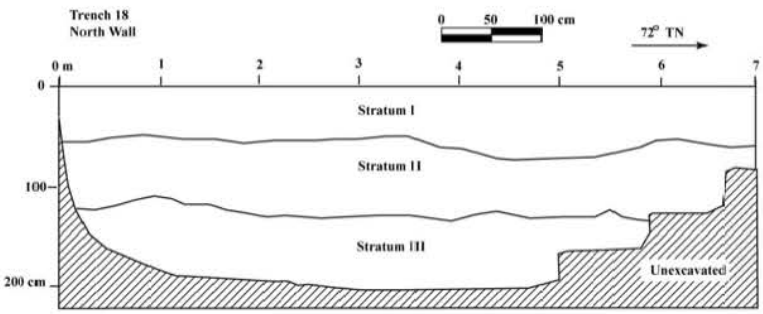

Figure 77. Backhoe Trench 18, north wall profile

Backhoe Trench 18
Stratum-Depth

I	0-70 cmbs	Dark yellowish brown (10YR3/4) silty clay loam; moderate, medium, subangular blocky structure; friable when moist, sticky and moderately non-plastic consistence; terrestrial origin; cobble-size concrete fragments found only on the surface and the upper 20 cm of loose soil; abrupt, smooth, boundary;
IIA	70-183 cmbs	Strong brown (7.5YR4/6) sandy loam; moderate, fine, subangular blocky structure; firm when moist, slightly sticky and slightly plastic consistence; terrestrial origin, diffuse, irregular boundary;
III	183-250+cmbs	Brown (7.5YR4/2) clay; weak, very fine prismatic structure; friable when moist, sticky and very plastic consistence; terrestrial origin; excavation arbitrarily terminated at 250 cmbs.

Section 6 Project Summary and Mitigation Recommendations

During a 1990 inventory survey of the southeastern portion of the current project area (West Loch Bluffs area), five sites, a railroad berm (Site 50-80-12-4345), three pumping station (Sites 50-80-12-4346, -4347, and -4348), and three features related to plantation infrastructure (Site 50-80-12-4344) were recorded and assigned SIHP permanent site numbers. During this survey, four historic documented areas of Hawaiian and later immigrant residence were also identified: the former sites of Honouliuli Taro Lands, Kapalani Church, PipeLine Village, and Drivers/Stable Village. Further work, especially subsurface testing, was recommended for these four areas.

During the recent 2005 surface survey of non-plowed areas of the 1,630-acre Ho'opili project area, four new features related to sugar cane cultivation or irrigation were recorded. These four features (Features D-G) were subsumed under the previous site number, Site 50-80-12-4344, used for scattered plantation infrastructure features.

A total of 19 trenches were excavated in the four areas of historic habitation and/or agriculture identified in the 1990 CSH survey to determine if there were any subsurface remains of: (1) nineteenth century (or earlier) habitation and agricultural lots in the Honouliuli Taro Lands; (2) structures or burials associated with the nineteenth century Kapalani Catholic Church; (3) structures or historic domestic artifacts associated with the early twentieth century Drivers and Stable Village; and, (4) structures or historic domestic artifacts or pit/privy features associated with the early twentieth century PipeLine Village. No cultural deposits, no privy pits, no burials, and no artifacts or any type were found or recovered from the 19 trenches. It seems that sugarcane cultivation, irrigation, flood control, railroad construction, later road construction, the demolition and movement of workers camps, and other factors have obliterated all, or almost all, traces of these former traditional Hawaiian habitation and agricultural lands and the later sugar cane plantation workers camps, churches, and schools.

6.1 Significance Assessments

Sites are evaluated for significance according to the broad criteria established for the National and State Registers. The five criteria are:

A	Site reflects major trends or events in the history of the state or nation.
B	Site is associated with the lives of persons significant in our past.
C	Site is an excellent example of a site type.
D	Site may be likely to yield information important in prehistory or history.
E	Site has cultural significance; probable religious structures and/or burials present.

During the 1990 survey of the West Loch Bluffs project area (southeastern section of the current project area) five sites were identified and given SIHP site designations. All five sites were determined as significant under criteria C and D. The three features (Features A-C) of Site

50-80-12-4344 (plantation infrastructure) were not recommended for any further work or for preservation. Sites 50-80-12-4345 (railroad berm), and Sites 70-12-4346, -4347, and -4348 (three pumping stations) were all recommended for preservation.

During the recent 2005 survey of the Ho'opili project area, four additional plantation infrastructure features adjacent to Honouliuli Gulch were identified. These features (Features D-G) were added to the Site -4344 description. Although this site was originally determined to significant as an "excellent site type" (Criteria C) in 1990, since that time the original three pipe features have been destroyed and the four new features found near Honouliuli Gulch represent only the scattered remnants of a once integrated plantation complex. Based on this lack of integrity, the site is no longer an "excellent example of a site type," and thus the significance should be changed to significant under Criteria D (for information) only. The remaining four features of Site –4344 have all had adequate documentation (photographs and scaled drawings), and are not recommended for further work or preservation.

The four areas of historic interest identified in the 1990 West Loch Bluffs survey (Honouliuli Taro lands, Kapalani Catholic Church, PipeLine Village, and Drivers/Stable Village) were not given site designations in the 1990 report since there were no surface remains. In the recent 2005 subsurface inventory of these four areas, no trace of any remains (charcoal, food remains, structural remains, cultural layers, firepits, artifacts, burials, etc.) associated with these four former habitation areas could be found. Therefore, again, these four areas are not assigned permanent state site numbers.

6.2 Mitigation Recommendations

Five sites have been previously identified in the project area during a 1990 CSH survey. Four new features were found for one of these sites during the current 2005 survey. No subsurface remains were found within 19 trenches during the recent backhoe testing of four habitation loci (Honouliuli Taro Lands, Kapalani Catholic Church, PipeLine Village, Drivers/Stable Village) for location of four habitation loci). However, it is possible that some traces of these habitation areas remain in subsurface deposits in areas not covered by the test trenches. Thus, an on-call/on-site monitoring program is recommended for these four specific areas during any future development. A summary of findings and recommendations for the project area is presented in Table 5; areas of concern for mitigation recommendations are shown on Figure 78.

Table 5. Significance and Mitigation Recommendations

Site (50-80-12)	Description	Signifi-cance	Further Work	Mitigation Recommendation
-4344 Fea. A-C	3 pipe features	C, D	None. Features were destroyed sometime between the 1990 and 2005 survey	None
-4344 Fea. D-G	Sugar cane cultivation/ irrigation features	C, D	None. The features were adequately recorded during the 2005 survey.	No preservation
-4345	Ewa Plantation Railroad Berm	C, D	Architectural Evaluation	Preservation
-4346	Northern Pumping Station	C, D	Architectural Evaluation	Preservation
-4347	Central Pumping Station	C, D	Architectural Evaluation	Preservation
-4348	Southern Pumping Station	C, D	Architectural Evaluation	Preservation
Honouliuli Taro Lands	Nineteenth century (and earlier) Hawaiian Habitation/Agricultural Area	None	No surface or subsurface remains were found during a recent 2005 inventory survey. No additional testing is necessary.	On-call/on-site archaeological monitoring during future development of the area
Kapalani Church	Nineteenth century Hawaiian Catholic Church, schoolhouse, and possible cemetery area	None	No surface or subsurface remains were found. No additional inventory survey is necessary.	On-call/on-site archaeological monitoring during future development of the area
PipeLine Village	Early twentieth century immigrant plantation habitation camp	None	No surface or subsurface remains were found. No additional inventory survey is necessary.	On-call/on-site archaeological monitoring during future development of the area
Drivers/Stable Villages	Early twentieth century immigrant plantation habitation camps	None	No surface or subsurface remains were found. No additional inventory survey is necessary.	On-call/on-site archaeological monitoring during future development of the area

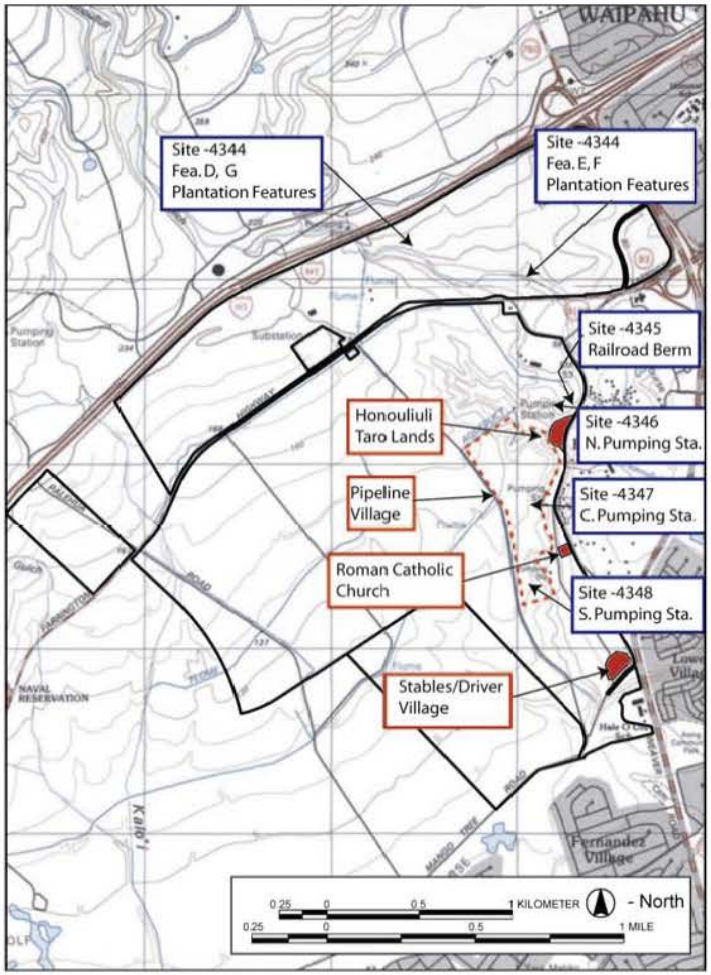

Figure 78. Areas of concern for significance and mitigation recommendations

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Appendix A

GPS Methodolgy and Coordinates

The location of each newly identified feature (Featuers D-G of Site 50-80-12-4344) within the project area was recorded with a high precision (sub-0.5 m) GPS unit, a Trimble Pro XR backpack GPS unit with a TSCI Datalogger. The data collected using the Trimble GPS unit was processed using ESRI's Arc Surveyor 5.0 and ArcGIS 9.1.

The locations of previously identified Features A-C of Site -4344 are not listed since they were not located on a map in the during the original 1990 survey of the project area, and were subsequently destroyed sometime before the recent 2005 inventory survey.

The location of previously recorded sites –4345, -4346, -4347, and –4348 were determined with the use of the 2002 National Geographic Holdings TOPO! Software.

Table 6. UTM coordinates for recorded sites and features

Sites (50-80-12)	North	East	Data Source
Site -4344, Fea. D	2364187.5	599287.1	Coordinates from GPS unit
Site -4344, Fea. F	2364023.9	600060.4	Coordinates from GPS unit
Site -4344, Fea. E	2364021.3	600005.5	Coordinates from GPS unit
Site -4344, Fea. G	2364114.2	599404.5	Coordinates from GPS unit
Site -4345	2363451	600234	Coordinates from USGS maps
Site -4346	2363309	599976	Coordinates from USGS maps
Site -4347	2362845	600162	Coordinates from USGS maps
Site -4348	2362417	600176	Coordinates from USGS maps

Appendix F

Cultural Impact Assessment for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu. Prepared for D. R. Horton - Schuler Division. Prepared by Cultural Surveys Hawai'i, Inc. December 2006.

Cultural Impact Assessment
for the Ho'opili Project,
Honouliuli Ahupua'a, 'Ewa District, Island of O'ahu
TMK: [1] 9-1-010:002; 9-1-017:004, 059; 9-1-018:001, 004, 072; 9-2-001:001

Prepared for

D. R. Horton – Schuler Division

Prepared by

Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai'i, Inc.

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(Job Code: HONO 76)

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Section 1 Management Summary

Reference	A Cultural Impact Assessment Report for the Ho'opili Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island TMK: [1] 9-1-010:002; 9-1-017:004, 059; 9-1-018:001, 004, 072; 9-2-001:001.
Date	December 2006
Project Number (s)	CSH Job Code: HONO 76
Project Area	The Project Areaproposed Project Area consists of several parcels which are identified by the following Tax Map Key numbers TMK: [1] 9-1-010:002; 9-1-017:004, 059; 9-1-018:001, 004, 072; 9-2-001:001.
Project Location	East Kapolei, 'Ewa District, O'ahu. The Project Area is generally bound on the north by the H-1 Interstate (I H-1), on the south by Mango Tree Road (a dirt road along the 'Ewa Villages Golf Course), Palehua Drive on the west, and Old Fort Weaver Road on the east There are two non-contiguous parcels,the first is located on the east side of new Fort Weaver Road (TMK 9-1-010:002), and the second is north of the H-1 Interstate in proximity to a reservoir (TMK 9-2-001:001).
Land Owner	D.R. Horton –Schuler LLC
Reviewing Agencies	State of Hawai'i Department of Health (DOH)/ Office of Environmental Quality Control (OEQC)
Project Description	The landowner plans to develop the project area into a mixed residential, commercial, and recreational property.
Project Acreage	1,630 acres
Document Purpose	Article IX and XII of the state constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices and resources of native Hawaiians and other ethnic groups pursuant to this legal mandate, cultural Surveys Hawai'i Inc. (CSH) conducted an analysis of the proposed projects impacts on cultural practices and features identified within the Project Area. CSH prepared this report in accordance with the requirement set forth under Hawaii revised status as amended (HRS), Chapter 343 and the OEQC's guidelines for assessing cultural impacts.
Consultation Effort	CSH consulted with various 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 area. CSH consulted with the State Historic Preservation Division, the Office of Hawaiian Affairs, the O'ahu Island Burial Council, and the 'Ewa Neighborhood Board. Information gathering sessions with the following community members: Arline Eaton, Richard Hirata, Richard Oshiro, Kenneth Soma, and Charles Nakamatsu along with many others in the community.

Summary and Recommendation	No contemporary or continuing cultural practices currently occur within the Project Area. It should be noted that subsurface historic properties associated with former traditional Hawaiian activities in the Project Area, such as artifacts and cultural layers, may be present despite the decades of modern activities such as ranching and sugar cane. As a precautionary measure, personnel involved in future development should be informed of the possibility of inadvertent cultural finds, and should be made aware of the appropriate notification measures to follow.

Table of Contents

Section 1 Management Summary i

Section 2 Introduction 1

2.1 Project Background 1
2.2 Scope of Work 1
2.3 Environmental Setting 5
2.3.1 Natural Environment 5
2.3.2 Built Environment 6
2.4 Methods 8
2.4.1 Documentary Research 8
2.4.2 Identification of Knowledgeable Informants 8

Section 3 Mythological and Traditional Accounts 9

3.1 The Naming of 'Ewa and Honouliuli 9
3.2 Legends and Place Name Meanings of the Upland Hills of Honouliuli 11
3.2.1 Pōhākea Pass 12
3.2.2 Paupauwela and Līhu'e 14
3.2.3 Hill of Maunauna 16
3.2.4 Pu'u Ku'ua 17
3.3 Pu'uokapolei and the Plains of Kaupe'a 19
3.3.1 Pu'uokapolei , Astronomical Marker and Heiau 19
3.3.2 Pu'uokapolei and the Plains of Kaupe'a and Kāne-hili 20
3.3.3 The plains of Kaupe'a and Pu'uokapolei and the Realm of Homeless Souls 21
3.3.4 The Plain of Pukaua 22
3.3.5 Pu'uokapolei and Kamapua'a 23
3.3.6 The Strife at Honouliuli; Kūali'i unites Hawai'i *nei* (*Mo'oleio o Kūali'i*) 24
3.4 Pearl Harbor (Pu'uloa) and West Loch (Kaihu o pala'ai) 25
3.4.1 The "Silent Fish" of Pearl Harbor 25
3.4.2 Ka'ahupāhau, the Queen Shark of O'ahu 27
3.4.3 Story of Ka'ehu-iki-manō-o-Pu'uloa, the Little Yellow Shark 30
3.4.4 Kāne and Kanalao and the Fish Ponds of West Loch 31
3.4.5 The Story of Kaihuopala'ai Pond, Honouliuli (*Ka'ao no Maikohā*) 32
3.4.6 The Traveling Mullet of Honouliuli (Fish Stories and Superstitions) 33
3.4.7 The Caves of Pu'uloa 34
3.4.8 Coastal Honouliuli 35

Section 4 Historic Background 39

4.1 Pre-Contact and Early Post-Contact Period 39
4.1.1 Observations of Early Explorers and Foreign Residents 43
4.2 Mid-Nineteenth Century and the Māhele 46
4.2.1 Project Area Māhele Awards 46
4.2.2 The Catholic Church 50
4.2.3 Honouliuli Māhele Awards to *Ali'i* 53
4.2.4 Early Ranching on the 'Ewa Plain 53
4.3 History of the Ewa Sugar Plantation 55
4.3.1 General History of the Plantation 55

4.3.2 History of the Ewa Sugar Plantation....57
4.3.3 History of PipeLine Village....58
4.3.4 History of Stable Village and Drivers Village....64
4.3.5 Other Enterprises in Honouliuli....64
4.3.6 The Military and Modern Developments....66

Section 5 Previous Archaeological Research 70

5.1 Early Archaeological Surveys....70
5.2 Previous Archaeological Work near Honouliuli town....76
5.2.1 West Loch Estates....76
5.2.2 NAVMAG – West Loch....78
5.2.3 'Ewa Villages....79
5.2.4 'Ewa Gentry Project....79
5.2.5 Previous Archaeology in the Current Project Area....80

Section 6 Traditional Land Use In Honouliuli Ahupua'a 81

6.1.1 The Coastal Zone - Kalaeloa (Barbers Point), Ko'olina (West Beach)....82
6.1.2 Honouliuli Taro Lands....83
6.1.3 Pu'uku'ua: Inland Settlement....83
6.1.4 Summary....84

Section 7 Community Consultation.... 86

7.1.1 Biographical Sketches of the Interview Informants....90

Section 8 Traditional Cultural Practices.... 91

8.1 Gathering for Plant Resources....91
8.2 Taro in Hawaiian Culture in Regards to the Project Area....92
8.3 Pa'akai (Salt Making)....96
8.4 Marine Resources....97
8.5 Burials....99
8.6 Historic Properties....99
8.7 Stream Resources....99
8.8 Trails....100
8.9 Wahi Pana (Storied Places)....100

Section 9 Conclusion and Recommendations.... 102

9.1 Conclusion....102
9.2 Recommendations....103

Section 10 References Cited 104

List of Figures

Figure 1. US Geological Survey map (2002), Waipahu quadrangle, showing Project Area (hatched area)....2
Figure 2. Tax Map Key (1) 9-1-010, 9-1-17, 9-1-018 and 9-2-002, showing Project Area....3
Figure 3. 2000 Aerial photograph of the Project Area, showing plowed fields....4
Figure 4. Soil Map of the Ho'opili Community Project Area....7
Figure 5. Place Names of Honouliuli (map adapted from Sterling and Summers 1978....10
Figure 6. Trails of Leeward Oahu. Map by Paul Rockwood. ('Ī'ī 1959:96) Mid- to late-1800s ..41
Figure 7. Portion of 1825 Map of the South Coast of Woahoo (O'ahu) and Honolulu by Lieut. C.R. Malden from the British ship the *Blonde* showing Honouliuli, the ancient trail, Pu'uokapolei, and the Project Area....42
Figure 8. Portion of 1873 W.D. Alexander map of Honouliuli, showing location of Papapuhi Point (habitation symbols are illegible); also note location of Kapalani Catholic Church....45
Figure 9. Portion of 1878 Monsarrat map, showing portion of Honouliuli Taro Lands in Relation to current alignment of Old Fort Weaver Road (eastern boundary of the Project Area)48
Figure 10. 1878 Map of Honouliuli Taro Lands (LCAs) by M.D. Monsarrat, with inserted '*ili* names....49
Figure 11. Portion of 1881 Hawai'i Government Survey Map (Alexander) showing location of the Catholic Church....51
Figure 12 . 1880s photograph of James Campbell's residence on the 'Ewa Plain (Bishop Museum Archives)....54
Figure 13. 1902 map showing relationship of Ewa Plantation and the Oahu Sugar Co. plantation; also note location of sisal growing area....56
Figure 14. 1939 map of the Ewa Plantation Co. lands, showing Project Area and alignment of railroad....58
Figure 15. Portion of an 1908/1913 U.S. Army Fire Control map, showing 47 houses in Pipeline Village; map also shows the alignment for the Ewa Plantation railway....60
Figure 16. 1927/1928 US Geological Survey map, showing location of PipeLine Village, Stable Village, Drivers's Village, and other Ewa Plantation structures, Salt Works and location of Chocolate Beach and Three Stones....61
Figure 17. Portuguese family residence at PipeLine Village. 1906....62
Figure 18 Discharge Pump No. 5, PipeLine Village 1907....62
Figure 19. PipeLine Village, family houses built in 1909, photograph taken on January 1910....63
Figure 20. PipeLine Village, April 7, 1907; *forno* (Portuguese brick bread oven) at center of photograph....63
Figure 21.1881 photo of salt pans near Kaunakakai, Moloka'i (Dorothe B. Curtis collection)....65
Figure 22. U.S. Geological Survey topographic map, showing previous archaeological survey areas in relation to the Project Area....77
Figure 23: Contact letter sent to organizations and individuals in Table 3....87

List of Tables

Table 1. Summary of land use and boundary landmarks recorded in Honouliuli LCA awards 47
Table 2. Previous archaeological work in Honouliuli and Pu'uloa 72
Table 3: Community Contact List....88
Table 4. Native Plants in Honouliuli....91

Section 2 Introduction

2.1 Project Background

At the request of D.R. Horton-Schuler Division (828 Fort Street Mall, 4th Floor, Honolulu, HI 96813), Cultural Surveys Hawai'i, Inc. (CSH) has completed this Cultural Impact Assessment Report for the East Kapolei Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island TMK: TMK: [1] 9-1-010:002; 9-1-017:004, 059; 9-1-018:001, 004, 072; 9-2-001:001 (Figure 1 and Figure 2).

The H-1 Interstate (I H-1) runs along the northern boundry of the project area. Mango Tree Road (i.e. a dirt road along the 'Ewa Villages Golf Course) is on the south. Pelehua Drive on the west, and Old Fort Weaver Road on the east.

Article IX and XII of the state constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices and resources of native Hawaiians and other ethnic groups pursuant to this legal mandate, cultural Surveys Hawaii Inc. (CSH) conducted an analysis of the proposed projects impacts on cultural practices and features identified within the Project Area. CSH prepared this report in accordance with the requirement set forth under Hawaii revised status as amended (HRS), Chapter 343 and the OEQC's guidelines for assessing cultural impacts

2.2 Scope of Work

The scope for the Cultural Impact Assessment is summarized as follows:

1) Examined historical documents, Land Commission Awards, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits, as may be indicated in the historic record.
2) Reviewed the existing archaeological information pertaining to the sites within the profect area as they allowed us to reconstruct traditional land use activities and identify and describe the cultural resources, practices, and beliefs associated with the parcel and identify present uses, if appropriate.
3) Conducted oral interviews with persons knowledgeable about the historic and traditional practices in the Project Area and the surrounding region. We experienced both formal and informal interviews.
4) Preparaed a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report assessed the impact of the proposed action on the cultural practices and any features identified.

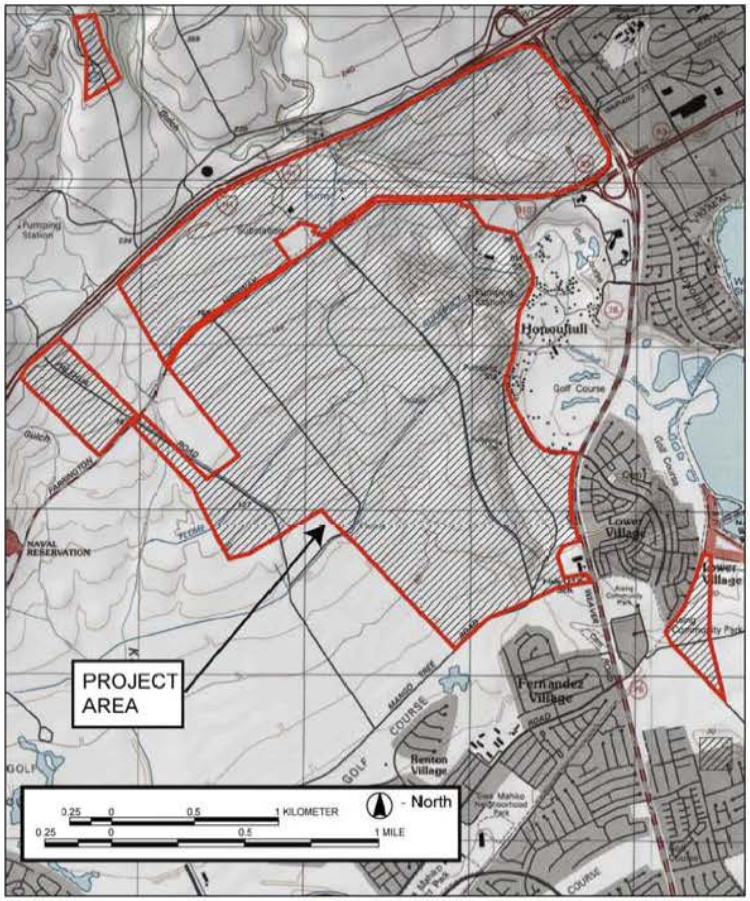

Figure 1. US Geological Survey map (2002), Waipahu quadrangle, showing Project Area (hatched area)

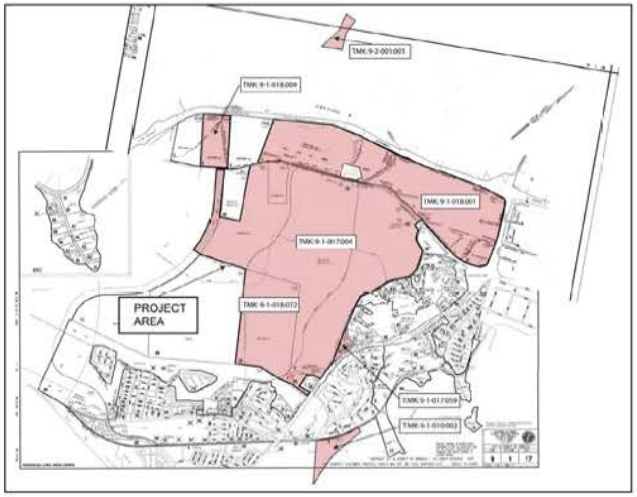

Figure 2. Tax Map Key (1) 9-1-010, 9-1-17, 9-1-018 and 9-2-002, showing Project Area

Figure 3. 2000 Aerial photograph of the Project Area, showing plowed fields

2.3 Environmental Setting

2.3.1 Natural Environment

Honouliuli Ahupua'a is the largest traditional land unit on O'ahu, extending from the West Loch of Pearl Harbor in the east, to the border of Nānākuli Ahupua'a at Pili o Kahe in the west. Honouliuli Ahupua'a includes approximately 19 km (kilometers), or 12 mi (miles) of open coastline from One'ula westward to Pili o Kahe. The *ahupua'a* extends *mauka* (inland) from West Loch nearly to Schofield Barracks in Wahiawā; the western boundary is the Wai'anae Mountain crest running north as far as Pu'u Hāpapa (or to the top of Ka'ala Mountain, according to some).

Topographically, the portion of the Project Area to the south of Farrington Highway is most notable for a scarp feature, typically 50 ft (15 m) high, the feature runs roughly north/south through the southeastern portion of the Project Area. This scarp is a Pleistocene fossil sea bluff. The northern portion of the Project Area is generally flat, except along Honouliuli Gulch, which runs through the center of this western portion.

Lying in the lee of the Wai'anae mountain range, the Project Area is one of the driest areas of O'ahu with most of the area averaging about 18 inches of rainfall annually (Juvik and Juvik 1998:56). Temperatures range between 60° to 90° Fahrenheit through the year; the highest temperatures are in August and September (Armstrong 1973). Elevation in the Project Area ranges from 40 ft (feet) AMSL (above mean sea level) to 240 feet, or 12 to 73 meters. The Project Area is located within the 'Ewa Plain, which is a Pleistocene (>38,000 years old) reef platform overlain by alluvium from the southern end of the Wai'anae Mountain Range. This alluvium supported commercial sugar cane cultivation for over a century.

In pre-contact Hawai'i the Project Area would have been mostly lowland dry shrub and grassland, dominated by species such as *wiliwili* (*Erythrina sandwicensis*), *lama* (*Diospyros ferrea*), sandalwood (*Santalum* sp.), *'a'ali'i* (*Dodonea eriocarpa*), scrub *'ōhi'a* (*Metrosideros collina*) and *pili* grass (*Heteropogon contortus*). Today in contrast, the non-cultivated portions of the Project Area are dominated by introduced species such as *kiawe* and *koa haole*. Understory plants include *'ilima ku kula* (*Sida cordifola*), cayenne vervain (*Stachytarpheta urticaefolia*), *ko'oko'olau* (*Bidens pilosa*), and morning glory (*Ipomoea indica*) (Moore and Kennedy 2002:3). The vast majority of the Project Area consists of plowed fields, with crops of pumpkins, squash, cucumbers, bananas, beans, and other vegetable products.

A total of ten soil series are found in the Project Area (Figure 4). The Ewa Series consists of well-drained soils in basins and on alluvial fans, developed in alluvium derived from basic igneous rock. They are nearly level to moderately sloping. These soils are used for sugarcane, truck crops, and pasture. The Helemano Series consists of well-drained soils on alluvial fans and colluvial slopes on the sides of gulches, which developed in alluvium and colluvium derived from basic igneous rock. They are steep to extremely steep. These soils are used for pasture, woodland, and wildlife habitat. The Honouliuli Series consists of well-drained soils on coastal plains; which developed in alluvium derived from basic igneous material. They are nearly level and gently sloping. These soils are used for sugarcane, truck crops, orchards, and pasture. The Kaloko Series consists of poorly drained soils on coastal plains which developed in alluvium

derived from basic igneous rock; the alluvium has been deposited over marly lagoon deposits. The soils are nearly level. These soils are used for irrigated sugarcane and pasture. The Kawaihapai Series consists of well-drained soils in drainageways and on alluvial fans on the coastal plains. The soils formed in alluvium derived from basic igneous rock in humid uplands. These soils are used for sugarcane, truck crops, and pasture. The Keaau Series consists of poorly drained soils on coastal plains, which developed in alluvium deposited over reef limestone or consolidated coral sand. They are nearly level and gently sloping. These soils are used for sugarcane and pasture. The Kunia Series consists of well-drained soils on upland terraces and fans; the soils developed in old alluvium. They are nearly level to moderately sloping. These soils are used for sugarcane, pineapple, homesites, and military reservations. The Molokai Series consists of well-drained soils on uplands, formed in material weathered from basic igneous rock. They are nearly level to moderately steep. These soils are used for sugarcane, truck crops, orchards, and pasture. The Waipahū Series consists of well-drained soils on marine terraces, which developed in old alluvium derived from basic igneous rock. They are nearly level to moderately sloping. These soils are used for sugarcane and homesites (Foote et al. 1972).

2.3.2 Built Environment

During the post-contact period the Project Area was primarily used for pastureland and for sugar cane irrigation and cultivation. At present, the Project Area is currently used for diversified agricultural activities, pastureland, seed cultivation, etc.

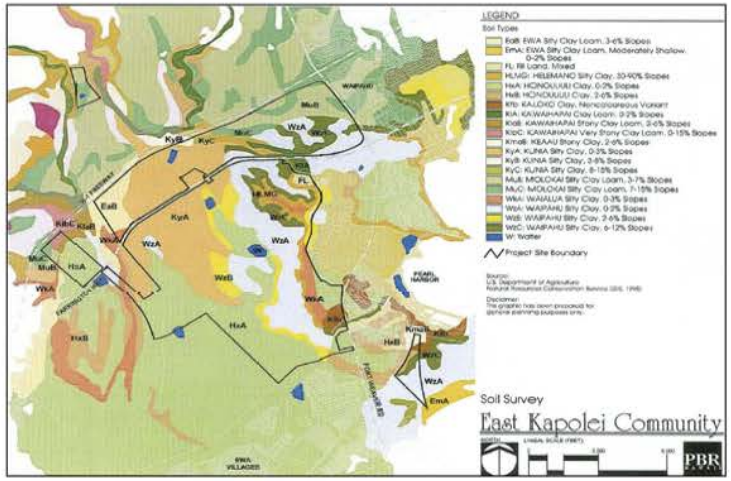

Figure 4. Soil Map of the Ho'opili Community Project Area

2.4 Methods

2.4.1 Documentary Research

CSH reviewed previous archaeological studies on file at the State Historic Preservation Division, CSH also reviewed geology and cultural history documents at Hamilton Library at the University of Hawai'i, the Hawai'i State Archives, the Mission House Museum Library, the Hawai'i Public Library, and the Archives of the Bishop Museum. Further research included a study of historic photographs at the Hawai'i State Archives and the Archives of the Bishop Museum, a study of historic maps at the Hawai'i State Archives and the Archives of the Bishop Museum, and a study of historic maps at the Survey Office of the Department of Accounting and General Services. Information regarding LCAs was obtained from Waihona 'Āina Corporation's Māhele Data Base (www.waihona.com).

2.4.2 Identification of Knowledgeable Informants

CSH consulted with various organizations and member of the community in order to identify *kūpuna* and other individuals with historic knowledge with respect to the Project Area and the surroundings. CSH consulted the Office of Hawaiian Affairs, the O'ahu Island Burial Council, 'Ahahui Siwila Hawai'i O Kapolei Hawaiian Civic Club, and the 'Ewa Neighborhood Board.

Based on recommendations from organizations and the community, the following individuals were contacted for information gathering sessions Arline Eaton, Richard Hirata, Richard Oshiro, Kenneth Soma, Charles Nakamatsu and many other talk story sessions (see Section 7 Community Consultation). These sessions were conducted in-person or by telephone.

Cultural anthropologist Kēhaulani Souza, B.A. conducted information gathering sessions under the general supervision of Hallett H. Hammatt, Ph.D. (Principal Investigator).

Section 3 Mythological and Traditional Accounts

The traditions of Honouliuli Ahupua'a have been compiled by several authors, in studies by Sterling and Summers (1978), Hammatt and Folk (1981), Kelly (1991), Charvet-Pond and Davis (1992), Maly (1992), and Tuggle and Tomonari-Tuggle (1997). Some of the traditional themes associated with this area include connections with Kahiki, the traditional homeland of Hawaiians in central Polynesia. There are several versions of the chief Kaha'i leaving from Kalaeloa for a trip to Kahiki; on his return to the Hawaiian Islands he brought back the first breadfruit (Kamakau 1991a:110) and planted it at Pu'uloa, near Pearl Harbor in 'Ewa (Beckwith 1940:97). Several stories associate places in Honouliuli to the gods Kāne and Kanaloa, with the Hawaiian pig god Kamapua'a and the Hina family, and with the sisters of Pele, the Hawaiian volcano goddess, all of who have strong connections with Kahiki (Kamakau 1991a:111; Pukui et al. 1974:200). The locations of traditional places names for Honouliuli are illustrated in Figure5.

3.1 The Naming of 'Ewa and Honouliuli

Honouliuli is the largest *ahupua'a* in the *moku* (district) of 'Ewa. One translation of the name for this district is given as "unequal" (*Saturday Press* Aug. 11, 1883). Others translate the word as "strayed" and associate it with the legends of the gods, Kāne and Kanaloa.

> When Kane and Kanaloa were surveying the islands they came to Oahu and when they reached Red Hill saw below them the broad plains of what is now Ewa. To mark boundaries of the land they would throw a stone and where the stone fell would be the boundary line. When they saw the beautiful land lying below them, it was their thought to include as much of the flat level land as possible. They hurled the stone as far as the Waianae range and it landed somewhere, in the Waimanalo section. When they went to find it, they could not locate the spot where it fell. So Ewa (strayed) became known by the name. The stone that strayed [Told to E.S. by Simeon Nawaa, March 22, 1954; cited in Sterling and Summers 1978:1].

Honouliuli means "dark water," "dark bay," or "blue harbor" and was named for the waters of Pearl Harbor (Jarrett 1930:22), which marks the eastern boundary of the *ahupua'a*. The Hawaiians called Pearl Harbor, Pu'uloa (*lit.* long hill). Another explanation for the names comes from the "Legend of Lepeamoa", the chicken-girl of Pālama. In this legend, Honouliuli is the name of the husband of the chiefess Kapālama and grandfather of Lepeamoa (Thrum 1923:164-184). "Her grandfather gave his name, Honouliuli to a land district west of Honolulu . . ." (Thrum 1923:170). Westervelt (1963:209) gives an almost identical account.

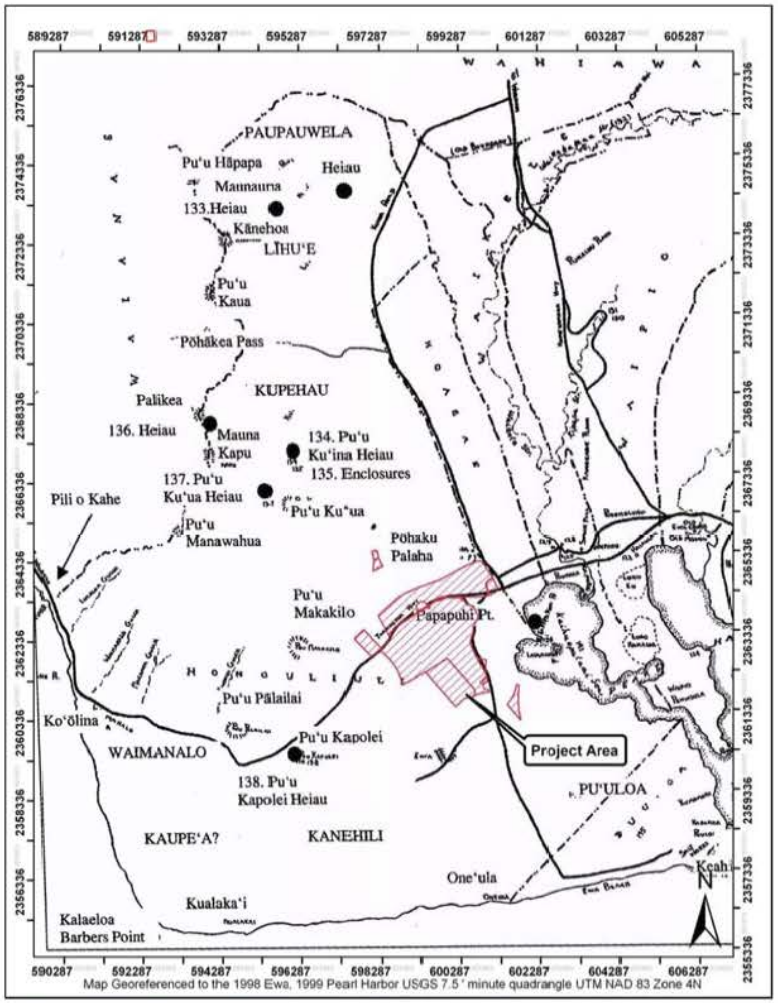

Figure 5. Place Names of Honouliuli (map adapted from Sterling and Summers 1978

It seems likely the boundaries of the western-most *ahupua'a* of 'Ewa were often contested with Wai'anae people. The 'Ewa people could cite divine sanction that the dividing point was between two hills at Pili o Kahe:

Eventually the stone was found at Pili o Kahe. This is a spot where two small hills of the Wai'anae Range come down parallel on the boundary between Honouliuli and Nānākuli ('Ewa and Wai'anae). The ancient Hawaiians said the hill on the 'Ewa side was the male and the hill on the Wai'anae side was female. The stone was found on the Waianae side hill and the place is known as Pili o Kahe.

> (Pili=cling to, Kahe=flow). The name refers, therefore, to the female or Waianae side hill. And that is where the boundary between the two districts runs [Told to E.S. by Simeon Nawaa, March 22, 1954; cited in Sterling and Summers 1978:1].

3.2 Legends and Place Name Meanings of the Upland Hills of Honouliuli

Honouliuli is divided from Wai'anae Ahupua'a on the west by a ridge with several prominent hills. From north (*mauka*) to south (*makai*) these peaks are: Hāpapa, which means "rock stratum (Pukui et al. 1974:42) or "shallow soil (Sterling and Summers 1978:1); Kānehoa (which will be discussed in more detail below); Pu'u Kaua, which means "war hill or fort hill" (Pukui et al. 1974:199); Palikea, which means "white cliff" (Pukui et al. 1974:177); Mount Kapu (meaning "tabu mountain"); and, Pu'u Manawahua, which means "great grief hill or nausea hill" (Pukui et al. 1974:203).

The central section of 'Ewa is divided by a series of northeast-southwest trending gulches that intermittently carry rainwater towards the coast. In this area there are several other notable hills; Pu'u Makakilo, which translates as "observing eyes hill" (Pukui et al. 1974:201); Pu'u Kapua'i, or "footprint hill" (Pukui et al. 1974:199); and, Pu'u Pālailai, probably meaning the young *lai* (*Scomberoides* sp.) fish (Pukui et al. 1974:205).

To the north (*mauka*) is Kānehoa, which can be translated as "companion of Kāne" (Pukui et al. 1974:84), "Kāne, the divine companion or friend," or Kāne, the divine fire-maker" (Westervelt 1999:64). This peak was named for a god (Kāne-hoa-lani), who was said to be the father of Pele (Emerson 1915:ix) in some versions, and the brother of Pele in others (Westervelt 1999:64). The hill Kānehoa is mentioned in the following hula chant.

Anklet Song	*Mele Ku-pe'e*
Fragrant the grasses of high Kanehoa.	*Aala kupukupu ka uka o Kane-hoa*
Bind on the anklets, bind!	*E ho-a!*
Bind with finger deft as the wind	*Hoa na lima o ka makani, he Wai- kaloa.*
That cools the air of this bower.	*He Wai-kaloa ka makani anu Lihue.*
Lehua blooms pale at my flower,	*Alina lehua i kau ka opua-*
O sweet heart of mine,	*Ku'u pua,*
Bud that I'd pluck and wear in my wreath.	*Ku'u puai'ini e ku-i a lei.*

If thou wert but a flower! *Ina ia oe ke lei 'a mai ia.*

[Emerson 1998:49]

A similar chant is found in the Legend of Pamano, which mentions the *kupukupu* (fern), a fragrant flowering shrub.

The uplands of Kanehoa are scented with kupukupu.
Bind on, the hands of the Waikoloa wind are binding,
The Waikoloa wind is the cold wind of Lihue,
Withering the branches in the uplands of Waiopua,
My flower I said I would string into garlands. If you have it,
You would have worn it.

Aala kupukupu ka uka o Kanehoa la!
Hoa! Hoa na lima o ka makani Waikoloa,
He Waikoloa ka makani anu, o Lihue,
Weli no loha ka uka o Waiopua la,
Kuu pua i i ai e kui e lei, I na ia oe ke lei ia ala

[Fornander 1919, Vol. V, Part 2:310-311].

3.2.1 Pōhākea Pass

Pōhākea Pass lies between the peaks of Pu'u Kaua and Palikea along the Wai'anae Mountain range. Pōhākea means "white stone" (Pukui et al. 1974:185).

3.2.1.1 Hi'iaka at the summit of Pōhākea Pass (Pele and Hi'iaka)

Pōhākea Pass was one of the resting places of Pele's sister, Hi'iaka, as she was returning from Kaua'i with Pele's lover Lohiau (Fornander 1918 Vol. V, Part 1:188 note 6). Hi'iaka elected to travel overland, while her companions traveled by canoe. A considerable number of *mele* (songs) and *pule* (prayers) are ascribed to Hi'iaka as she stood at the summit of Pōhākea (*Aluna au a Pōhākea, Kū au, nānā ia Puna . . .*) (Emerson 1915:162-168). From this vantage point Hi'iaka could see through her powers of vision that her beloved *lehua* groves and friend Hōpoe at Puna, Hawai'i Island had been blasted by Pele. She could also see that in her canoe, off the coast of Wai'anae, Lohiau was seducing her traveling companion Wahine'ōma'o.

3.2.1.2 Keahumoa, Residence of Māui's Grandfather

In the Legend of Māui's Flying Expedition (Thrum 1923:252-259) Māui-kupua looked toward Pōhākea Pass and saw his wife, Kumulama, being carried away by chief Peapeamakawalu. After failing to recover her, Māui returned and told his problems to his mother, Hina. Hina instructed her son to go to Keahumoa and visit his grandfather, Kuolokele, who lived there in a large hut. The hump-backed Kuolokele returned home with a load of potato leaves, and Māui cured him by striking him in the back with a stone (which Kuolokele threw to Waipahu, where it remains). Kuolokele had Māui gather *kī* leaves, *'ie'ie* vines and bird feathers, from which the old man fabricated a "bird-ship" (*moku-manu*), which Māui used to defeat Peapeamakawalu and recover his wife. They returned to Kuolokele's house, where they feasted, and Māui ate Peapeamakawalu's eyeballs.

3.2.1.3 The Frightened Populace of Honouliuli

In the Legend of Palila (Fornander 1918, Vol. V, Part 1:136-153), the *kupua*, or demigod hero, of Kaua'i landed at Ka'ena Point with his fabulous war club (*lā'au pālau*), which required eighty men to carry, and crossed into Honouliuli through Pōhākea Pass. He traveled by throwing his supernatural war club and hanging on to one end. The first throw was to Ka'ena Point, Oahu.

> After leaving Kaena he came to Kalena, then on to Pohakea, then to Maunauna, then to Kanehoa, then to the plain of Keahumoa and looking toward Ewa. At this place he stood and looked at the dust as it ascended into the sky caused by the people who had gathered there; he then pushed his war club toward Honouliuli.
>
> *Haalele keia ia Kaena, hele mai la a Kalena, a Pohakea, maunauna, kanehoa, a ke kula o Keahumoa, nana ia Ewa. Ku keia I laila nana I ke ku a ka ea o ka lepo I na kanaka, e pahu aku ana keia I ka laau palau aia nei I kai o Honouliuli. . . .*
> [Fornander 1918, Vol. V, Part I:142-143]

He descended to the plain of Keahumoa:

> At this place he stood and looked at the dust as it ascended to the sky caused by the people who had gathered there; he then pushed his war club toward Honouliuli. When the people heard something roar like an earthquake they were afraid and they all ran to Waikele . . .
>
> *Kū kēia i laila nānā i ke kū ka ea o ka lepo i nā kānaka, e pahu aku ana kēia i ka lā'au pālau aia nei i kai o Honouliuli, kū ka ea o ka lepo o ka honua, me he ōla'i la, maka'u nā kānaka holo a hiki i Waikele.*
> [Fornander 1918, Vol. V, Part I:142-143]

3.2.1.4 Kahalaopuna at Pōhākea Pass

One of the most popular legends of O'ahu is that of Kahalaopuna (or Kaha), a young woman of Mānoa who was slandered by others and then killed by her betrothed, Kauhi, a chief from Ko'olau. While the numerous accounts (Day 1906:1-11, Fornander 1918 Vol. V, Part 1:188-193, Kalākaua 1888:511-522, Nakuina 1904:41-45, Patton 1932:41-49, Skinner 1971:220-223, Thrum 1907:118-132, Westervelt 1987 127-137, Westervelt 1998:84-93) vary in details, they typically have Kahalaopuna slain and then revived repeatedly with the aid of a protective owl. Kauhi forced her to hike west from Mānoa through the uplands until they got to Pōhākea Pass through the southern Wai'anae Range in north Honouliuli. At Pōhākea Pass, Kauhi beat her with a stick until she was dead (*Ia hahau ana a Kauhi i ka lā'au, make loa o Kahalaopuna*). Her spirit (*'uhane*) flew up into a *lehua* tree and chanted for someone to go notify her parents:

E hai aku oukou ua make o Kahalaopuna;	And tell them that Kahalaopuna is dead
Aia la i ka uka o Pohakea,	For she lies in the uplands of Pohakea
I ke kumu lehua la o lalo iho.	Beneath the lehua tree.

[Fornander 1918, Vol. V, part 1:192

Upon hearing the news, her parents fetched Kahalaopuna back to Mānoa, and she was restored.

3.2.2 Paupauwela and Līhu'e

Paupauwela, also spelled Popouwela (derivation unknown), is the name of the land area in the extreme *mauka* section of Honouliuli *Ahupua'a*. The land area of Līhu'e is just *makai* of this land, and extends into the *ahupua'a* of Waipi'o (adjacent to the eastern border of Honouliuli). Both place names are mentioned in a chant recorded by Abraham Fornander, which was composed as a *mele* for the O'ahu king, Kūali'i, as he was preparing to battle Kuiaia, the chief of Wai'anae:

Where? Where is the battle field	*Ihea, ihea la ke kahua,*
Where the warrior is to fight?	*Paio ai o ke koa-a?*
On the field of Kalena, I	*kai i kahua i Kalena,*
At Manini, at Hanini,	*I Manini, i Hanini*
Where was poured the water of the god	*I ninia i ka wai akua,*
By your work at Malamanui;	*I ko hana i Malamanui*
On the heights of Kapapa, at Paupauwela,	*Ka luna o Kapapa, i Paupauwela,*
Where they lean and rest;	*I ka hilinai i ke kalele,*
At the hala trees of indolent Halahalanui,	*Ka hala o Halahalanui maauea,*
At the ohia grove of Pule-e	*E kula ohia ke Pule-e,*
The god of Lono, of Makalii	*Ke 'kua o Lono o Makalii*
Thr fragrant branch of the Ukulonoku,	*Ka lala aalao Ukulonoku,*
Mayhap from Kona, from Lihue,	*No Kona paha, no Lihue.*
For the day at Maunauna	*No ka la i Maunauna,*
For the water at Paupauwela.	*No ka wai i Paupauwela.*

[Fornander 1917, Vol. IV, Part 2:384-386].

Red is the water of Paupauwela,	*Ula ka wai i Paupauwela,*
From the slain at Malamani,	*Ke kilau o Malamani,*
The slain on the ridge at Kapapa.	*Ka moo kilau I Kapapa.*

The derivation of the place name Līhu'e (meaning "cold chill") is illustrated in the following poem; all other places names mentioned in this poem are in Waipio:

The icy wind of Lihue plied its spurs,
Pulling up the bridle of Haleauau,
Speeding headlong over Kalena
And running over the plain of Kanoenoe

[*Ka Loea Kālai'āina*, July 22, 1899, translated in Sterling and Summers 1978:21].

This explains the meaning of a Hawaiian saying "*Hao na kēpā o Līhu'e i ke anu*. The spurs of Līhu'e dig in with cold" [Pukui 1983:#479].

The icy winds of Honouliuli are also noted in a *mele* for the high king Kūali'i. In this *mele*, the cold winds of Kumomoku and Leleiwe, near Pu'uloa in Honouliuli are compared unfavorably to the god Kū.

Not like these are thou,	*Ku Aole i like Ku.*
[Nor] the rain that brings the land breeze,	*Ia ua hoohali kehau,*
Like a vessel of water poured out.	*Mehe ipu wai ninia la,*
Nor to the mountain breeze of Kumomoku,	*Na hau o Kumomoku;*
[The] land breeze coming round to Leleiwi.	*Kekee na hau o Leleiwi,*
Truly, have you not known?	*Oi ole ka oe i ike*
The mountain breezes, that double up your back,	*I ka hau kuapuu.*
[That make you] sit crooked and cramped at Kaimohala,	*Kekee noho kee, o Kaimohala,*
The Kanehili at Kaupea?	*O Kanehili i Kaupea-la*
Not like these are thou, Ku.	*Aole i like Ku.*

[Fornander 1917, Vol. IV, Part II:390-391]

In the Legend of Halemano (Fornander 1919, Vol. V, Part II:252), the romantic O'ahu anti-hero chanted a love song with a reference to the winds of Līhu'e:

Search is made to the top of Ka'ala,	*Huli a'e la Ka'ala kau i luna,*
The lower end of Pōka'ī is plainly seen.	*Waiho wale kai o Pōka'ī,*
Love looks in from Honouliuli,	*Nānā wale ke aloha i Honouliuli,*
The dew comes creeping, it is like the wind of Līhu'e...	*Kokolo kēhau he makani no Līhu'e.*

The wind of Lihu'e and others in the region are also named by Moses K. Nakuina, as follows:

Moa'e-kū is of 'Ewaloa
Kēhau is of Waiopua
Waikōloa is of Līhu'e
Kona is of Pu'uokapolei
Maunuunu is of Pu'uloa

[Nakuina 1992:43]

The *ali'i* (chiefly class) were closely associated with Līhu'e, which had habitation areas and playing grounds set aside for their sports.

> Lolale was the father and Keleanohoapiapi the mother of Ka-lo-kaholi-a-Lale. He was born in the land of Lihue and there he was reared into manhood. He excelled in good looks and greatly resembled his mother.
>
> In the olden days the favorite occupation of Lihue chiefs was spear throwing and the best instructors hailed from this locality [*Ka Nūpepa Kū'oko'a*, Aug. 26, 1865, translation in Sterling and Summers 1978:23].

Līhu'e was also the home of a famous cannibal king-man, Kaupe, who overthrew the ruling chiefs to become the paramount power between Nu'uanu and the sea. He had a home and a *heiau* in Līhu'e. Kaupe was a *kapua*, a supernatural being who could take the form of a man or a dog; this type of dog man was known as an *'ōlohe*. Although he left the O'ahu *ali'i* alone, he killed many commoners in the area, and eventually sailed to the island of Hawai'i on a raid, where he captured a chief's son; he planned to sacrifice this boy at his *heiau* in Līhu'e. The father came to O'ahu, and with the help of the priests of the Hawaiian hero, Kahanaiakeakua, was able to free his son, escape back to Hawai'i, and eventually kill the dog-man, Kaupe (Westervelt 1963:90-96).

3.2.3 Hill of Maunauna

The hill Maunauna lies between the lands Paupauwela and Līhu'e. It was at Maunauna, according to one tradition, that the forces of the chiefs of Kūali'i and Kuiaia of Waianae met to do battle, but was averted when a *mele* honoring the god Kū was chanted (see previous section). (Fornander 1917, Vol IV, Part 2:348). In the Legend of Ke-ao-melemele, a woman named Paliuli traveled in this area.

> In a very short time she [Paliuli] walked over the plain of Ewa; Ewa that is known as the land of the silent fish [pearl oysters] . . . She went on to the plain of Punalu'u and turned to gaze at Maunauna point and the plain of Lihue [Manu 1885, translation in Sterling and Summers 1978:21].

According to the surveyor W. D. Alexander (1903:367-425), Maunauna means "waste."

Certain place names in the uplands, including Maunauna, are also mentioned in the story of Lo-lae's Lament. The place of Lolale's residence is given in King Kalākaua's version of this story. According to him (Kalākaua 1990:232): "There lived there at that time in Lihue, in the district of Ewa, on the island of Oahu, a chief named Lo-lale, son of Kalona-iki, and brother of Piliwale, the *alii-nui*, or nominal sovereign, of the island, whose court was established at Waialua."

In this story, Lolale was a chief of O'ahu who asked his friend Kalamakua to find him a bride (Kalākaua 1990:228-246; Skinner 1971:217-219). Kalamakua traveled to Maui and chose Kelea, the chief's sister, and returned with her to O'ahu; during this time the two grew close. Kelea lived with Lolale for a while, but he was a silent type that was often away from home playing sports and walking in the woodlands. Longing for Kalamakua, Kelea decided to leave her husband, Lolale voiced no "spoken bitterness;" however, after she left, he sang this lament:

> Farewell, my partner of the lowland plains,
> On the waters of Pohakeo, above Kanehoa,
> On the dark mountain spur of Mauna-una!
> O, Lihue, she is gone!
> Sniff the sweet scent of the grass,
> The sweet scent of the wild vines
> That are twisted by Waikoloa,
> By the winds of Waiopua,
> My flower!

> As if a mote were in my eye.
> The pupil of my eye is troubled.
> Dimness covers my eyes. Woe is me!

[Kalākaua 1990:244-245].

3.2.4 Pu'u Ku'ua

Makai of the land of Lihu'e was the land of Kupehau, which was itself *mauka* of Pu'u Ku'ua. Divine sanction was also given to social stratification and the designation of a land for *kauwā* (outcastes, pariahs), a low, slave caste of Hawai'i, in the vicinity of Pu'u Ku'ua:

> . . . If you are above Puuloa, you wil see Pu'u-o-Kapolei, a small hill. Lying below and back of that hill is the government road going to Waianae. Above that is also a small hill and back of that, is a big hill and above it is a large hollow. That is Pu'u-Kuua where the very dirty ones lived [*Ka Loea Kālai'āina* July 15, 1899, translation in Sterling and Summers 1978:32].

The creation of the *kauwā* class is told in a tradition of the gods Kāne and Kanaloa:

> *A penei na'e i kauwā loa [sic. "loa'a"] ai. Aia a mana'o ke Ali'i Nui (Mō'ī) e 'au'au kai i Waikīkī. Eia ka nīnau a ke Ali'i Nui i ke ali'i ma lalo iho ona, "Pehea āu mau wahi lepo kanu o Pu'u Ku'ua? 'A'ole paha he mau wahi pōhuli?" Eia ka pane a ke ali'i ma lalo iho ona, "He Pōhuli nō. 'O ke kauoha ia akula nō ia e ki'i. 'Oiai ko kāne me ka wahine e nanea ana me nā keiki, a hiki 'ana ke ki'i i mau keiki. 'O ke kū a'ela nō ia o ka makuakāne a lawe 'ana i kāna mau keiki a hiki i Waikīkī. Aia ho'i a hiki i ka wā a ke Ali'i e hele ai i ka 'au'au kai, a laila, haouna 'ia mai ke kahu e ki'i mai i ua keiki a lawe aku ia ma kahi pāpa'u o ke kai, ma kahi a ke Ali'i nui e hele kū 'ana, a laila kau nā lima o ka Mō'ī i luna o kahi keiki a me kahi keiki, ma nā 'ā'ī o nā keiki a pa'a ai. 'O ka hua 'ōlelo ma ka waha o ke Ali'i nui e 'ōlelo ai, "'A'ole pau ku'u loa! 'A'ole pau ku'u loa!" 'Oiai 'o ia e 'au ana me ka pa'a nō o nā lima i nā keiki a hiki i ka umauma ke kai o ke ali'i. Ua lana a'ela nā keiki i luna o ka 'ilikai, aia ke alo i lalo. Eia ho'i ka 'ōlelo a ka makuakāne ma kula aku nei, "Moe mālie i ke kai o ko Haku," a pēlā aku.*

> *'O ke kai o Waikīkī ke kai i 'ōlelo 'ia he kai lumaluma'i kanaka o ka lua, aia i Kualoa* [*Ka Loea Kālai'āina*, July 8, 1899].

Translation:

> The chiefs of old, who lived at that time, were of divine descent. The two gods [Kāne and Kanaloa] looked down on the hollow [vicinity of Pu'u Ku'ua] and saw how thickly populated it was. The mode of living here was so that chiefs and commoners mixed freely and they were so like the lowest of people (*kauwā*). That is what these gods said and that was the time when the term *kauwā* was first used, and was used for many years afterwards. . . . This was how they were made to be *kauwā*. When the ruling chief wished to go to Waikīkī for sea bathing he asked the chief just below him in rank, "How are my planting places at Pu'u Ku'ua,

have they not produced young suckers?" The chief next to him answered, "There are some suckers," and sent someone for them. When the men, women and children least expected it, the messenger came to get some of the children. The father stood up and took his sons to Waikīkī. Then, when the ruling chief went sea bathing, he sent an attendant to get the boys and take them to a shallow place where the ruling chief would come. Then the ruler placed a hand on each of the boys, holding them by the necks. The words he uttered were, "My height has not been reached! My height has not been reached!" He advanced and held onto the boys until the sea was up to his chest. The boys floated on the water face down. The father on shore called out, "Lie still in the sea of your Lord," and so on.

The Sea of Waikīkī is said to have been used to kill men in and the other place is Kualoa. The inhabitants of Pu'u-Kuua were so mixed, like taro beside an imu [translation in Sterling and Summers 1978:32-33].

A Hawaiian saying concerning 'Ewa suggests that this drowning also took place in this *ahupua'a*.

'Ewa of the drowning sea *'Ewa kai lumaluma'i*

An epithet applied to 'Ewa, where *kauwā* were drowned prior to offering their bodies in sacrifice [Pukui 1983:#385].

On Hi'iaka's journey as she leaves 'Ewa and descends to the coast, she sees some women stringing *lei* and offered a chant, naming several place names in the area:

Rising in the presence of the	*Ke ku no i ke alo o*
cliff of Pu'uku'ua	*pali o Pu'uku'ua*
The land is indeed a chief	*He ali'i nona'e ka 'āina*
Man is indeed a slave	*He kauwā no na'e kanaka*
I am indeed a slave to aloha – love	*I kauwā no na'e wau i ke aloha*

[*Ka hōkū o Hawai'i* February 22, 1927, translation in Maly 1997:17]

The great fisherman, Nihookeki, was born in Keauhou, Kona, but traveled to O'ahu and lived in Wai'anae and became a great chief. Fornander (1917, Vol. IV, Part 3:488) places his home at Pu'u ku'ua, in Pu'u o Kapolei in Wai'anae, possibly during one of the times that both Wai'anae and 'Ewa were ruled by one chief.

O Keauhou, i Kona, Hawaii, ka aina hanau o Nihooleki, a malaila mai ka hele ana a noho i Kuukuua, i Puuokapolei ma Waianae, no laila ka wahine.

Keauhou in Kona, Hawaii, was the birthplace of Nihooleki and it was from this place that he moved to Kuukuua, in Puuokapolei at Waianae, where he took unto himself a wife [Fornander 1917, Vol. IV, Part 3:488-489].

Keahaikiaholeha, the paramount chief of Wai'anae, owned a famous mother-of-pearl fishhook, called Pahuhu, which he used to catch many *aku* (bonito, *Katsuwonus pelamis*). He later sailed to Waimea, Kaua'i, where his wife had been born, and there also became the ruling

chief of Kaua'i. When Keahaikiaholeha died, his body was brought back to Kuukuua and placed in a *pu'āo* (*A make o Kaehaikiaholeha, hoihoi ia mai a Kuukuua, i Waianae, waiho ia kona kino kupapau; i loko o ka hale, puoa . . .*). A *pu'āo* is an open, small, temporary cone-shaped structure, of poles; in this case, this *pu'āo* was used as his tomb. The parents of the chief worshiped the spirit (*'uhane*) of their son, until it became strong enough to go about in the form of a live person. The spirit took the name of Nihooleki, traveled to Kaua'i, and married his wife, although she was unaware that this was the spirit of her dead husband. Nihooleki used his magic fishhook to catch canoes full of *aku* until it became the wonder of the islands. The piles of fish that he caught and gave away came to the ears of Kamapua'a, who was then living at Waiohuli, sick with dropsy.

Nihooleki told his wife that if a man with dropsy came to the door, to ask him in because he was a friend. But when Kamapua'a arrived, the wife would not let him in since he was so dirty. Kamapua'a had to wait in the pig pen for the return of his friend. Nihooleki was angry about the treatment of his friend when he returned and left the island with Kamapua'a.

Lohe aku la na 'lii, a me na kaikoeke, o ke 'lii no keia, alualu mai la lakou, luu laua nei i ke kai, a ea ana i Kuukuua, ma Waianae. . . .

A kakoke laua i ka hale o na mauka a me ke kaikuahine, a e ku ana hoi ka puoa hale o ke kino kupapau ona. ". . . A o ke kaikuahine o kaua, o kau wahine no ia, no ka mea, he wahine maikai, ua nui no ke kino."

O Kaehaikiaholeha, oia o Nihooleki, komo aku la ia i kona puoa kupapau a nalo iho la, ola ka pau o kona kuao ana.

He [Nihooleki] and his friend [Kamapua'a] then dove into the sea and swam under water until they came up at Kuukuua, at Waianae. . .. As they drew near to the house where the parents and sister of Nihooleki were living and near to the tomb where his dead body was laid, Nihooleki then turned to his friend. " . . . Take our sister and make her your wife as she is fair to look upon and is also of proper age." . . . Keahaikiaholeha, who was Nihooleki, entered the tomb and disappeared. Thus ends the story [Fornander 1917, Vol. IV, Part 3:496].

This legend suggests associations with Pu'u ku'ua to Pu'uokapolei , worship of the dead, and wandering souls, all of which are prominent themes associated with Pu'u Kapolei, as seen in the next section. It also ties the pig god Kamapua'a to Pu'uokapolei in 'Ewa.

3.3 Pu'uokapolei and the Plains of Kaupe'a

Pu'uokapolei is a prominent hill at the *mauka* edge of the coastal 'Ewa Plains and was the primary landmark for travelers on the trail that ran from Pearl Harbor west to Wai'anae ('Ī'ī 1959:27, 29; Nakuina 1992:54; E.M. Nakuina 1904, in Sterling and Summers 1978:34).

3.3.1 Pu'uokapolei , Astronomical Marker and Heiau

Pu'u means hill and Kapolei means "beloved Kapo," a reference to the sister of the Hawaiian volcano goddess, Pele. Samuel Kamakau (1976:14) says that ancient Hawaiians used Pu'u o

Kapolei as an astronomical marker to designate the seasons. Samuel Kamakau (1870 *Mo'olelo Hawai'i* Vol. I, Chap. 2, p. 23) relates:

> . . . the people of O'ahu reckoned from the time when the sun set over Pu'uokapolei until it set in the hollow of Mahinaona and called this period Kau [summer], and when it moved south again from Pu'uokapolei and it grew cold and the time came when young sprouts started, the season was called from their germination (*'ōilo*) the season of Ho'oilo [winter, rainy, season].

A *heiau* was once on Pu'u o Kapolei, but had been destroyed by McAllister's (1933:108) survey of the island in the early 1930s. The hill was used as a point of solar reference or as an observation place for such observations (Fornander 1919, Vol. VI, Part 2:292). Pu'uokapolei may have been regarded as the gate of the setting sun, just as the eastern gate of Kumukahi in Puna is regarded as the rising sun; both places are associated with the Hawaiian goddess Kapo (Emerson 1915:41). This somewhat contradicts some Hawaiian cosmologies, in which Kū was the god of the rising sun, and Hina, the mother of Kamapua'a was associated with the setting sun. Fornander (Fornander 1919, Vol. VI, Part 2:292) states that Pu'uokapolei may have been a jumping off place (also connected with the setting sun) and associated with the wandering souls who roamed the plains of Kaupe'a and Kāne-hili, *makai* of the hill.

3.3.2 Pu'uokapolei and the Plains of Kaupe'a and Kāne-hili

Hi'iaka sang this bitter chant addressed to Lohiau and Wahine-oma'o, which uses the association of the Plains of Kaupe'a as a place for the wandering of lost souls:

Ku'u aikana i ke awa lau o Pu'uloa,
Mai ke kula o Pe'e-kaua, ke noho oe,
E noho kaua e kui, e lei i ka pua o ke kauno'a,
I ka pua o ke akuli-kuli, o ka wili-wili;
O ka iho'na o Kau-pe'e i Kane-hili,
Ua hili au; akahi no ka hili o ka la pomaika'i;
E Lohiau ipo, e Wahine-oma'o,
Hoe 'a mai ka wa'a i a'e aku au.

We meet at Ewa's leaf-shaped lagoon, friends;
Let us sit, if you will on this lea
And bedeck us with wreaths of Kauno'a,
Of akuli-kuli and wili-wili,
My soul went astray in this solitude;
It lost the track for once, in spite of luck,
As I came down the road to Kau-pe'a.
No nightmare dream was that which tricked my soul.
This way, dear friends; turn the canoe this way;
Paddle hither and let me embark

[Emerson 1915:162-163].

Several other Honouliuli places are mentioned in this chant, including Pe'e-kaua, which may be a variation of Kau-pe'e or Kaupe'a, and the plains of Kānehili, the last of which again refers to wandering, as the word *hili* means "to go astray" (Emerson 1915:162). In the chant, Hi'iaka is moving downhill from Kaupe'a, probably the plains adjacent to Pu'uokapolei , toward the coast, the plain of Kānehili.

3.3.3 The plains of Kaupe'a and Pu'uokapolei and the Realm of Homeless Souls

There are several places on the 'Ewa coastal plain that are associated with *ao kuewa*, the realm of the homeless souls. Samuel Kamakau (1991b:47-49) explains the Hawaiian beliefs in the afterlife:

> . . . There were three realms (*ao*) for the spirits of the dead. . . There were, first, the realm of the homeless souls, the *ao kuewa*; second, the realm of the ancestral spirits, the *ao 'aumakua*; and third, the ream of Milu, *ke ao o Milu* . . .
>
> The *ao kuewa*, the realm of homeless souls, was also called the *ao 'auwana*, the realm of wandering souls. When a man who had no rightful place in the '*aumakua* realm (*kanaka kuleana 'ole*) died, his soul would wander about and stray amongst the underbrush on the plain of Kama'oma'o on Maui, or in the *wiliwili* grove of Kaupe'a on Oahu. If his soul came to Leilono [in Halawa, 'Ewa near Red Hill], there he would find the breadfruit tree of Leiwalo, *ka'ulu o Leiwalo*. If it was not found by an '*aumakua* soul who knew it (*i ma'a mau iaia*), or one who would help it, the soul would leap upon the decayed branch of the breadfruit tree and fall down into endless night, *the pō pau 'olo o Milu*. Or, a soul that had no rightful place in the '*aumakua* realm, or who had no relative or friend (*makamaka*) there who would watch out for it and welcome it, would slip over the flat lands like a wind, until it came to a leaping place of souls, a *leīna a ka 'uhane*. . . [Kamakau 1991b:47].
>
> On the plain of Kaupe'a beside Pu'uloa [Pearl Harbor], wandering souls could go to catch moths (*pulelehua*) and spiders (*nanana*). However, wandering souls could not go far in the places mentioned earlier before they would be found catching spiders by 'aumakua souls, and be helped to escape. . . . [Kamakau 1991b:49].

The breadfruit tree Leilono was said to have been located on the 'Ewa-Kona border, above Āliamanu. In another section of his account of the dead, Kamakau calls the plain of wandering souls the "plain at Pu'uokapolei."

> There are many who have died and have returned to say that they had no claim to an 'aumakua [realm] (*kuleana'ole*). These are the souls, it is said, who only wander upon the plain of Kama'oma'o on Maui or on the plain at Pu'uokapolei on Oahu. Spiders and moths are their food [Kamakau 1991b:29].

This association of Pu'uokapolei and Kanehili with wandering souls is also illustrated in a lament on the death of Kahahana, the paramount chief of O'ahu, who was killed by his father, Kahekili, after Kahahana became treacherous and killed the high priest Kaopulupulu.

Go carefully lest you fall dead in the sun,	*E newa ai o hea make i ka la,*
The god that dwells on Kapolei hill.	*Akua noho la i Puuokapolei.*
The sun is wailing on account of the women of Kamao,	*E hanehane mai ana ka la i na wahine o Kamao,*
A hiding god, blossoming ohai of the banks,	*Akua pee, pua ohai o ke kaha,*
Contented among the stones-	*I walea wale i ke a-*
Among the breadfruit planted by Kahai.	*I ka ulu kanu a Kahai.*
Thou wast spoken of by the oo-	*Haina oe e ka oo-*
By the bird of Kanehili.	*E ka manu o Kanehili.*

[Fornander 1919, Vol. VI, Part 2:297]

Fornander provides some notes on this lament. The god dwelling at Kapolei is the god Kahahana, stating that this is where his soul has gone. Kamao is one of the names of the door to the underworld. This lament draws an association with wandering souls and the place where the first breadfruit tree was planted by Kahai at Pu'uloa (Fornander 1919, Vol. VI, Part 2:304).

Pukui (1983:180) offers this Hawaiian saying, which places the wandering souls in a *wiliwili* grove at Kaupe'a.

The wiliwili grove of Kaupe'a *Ka wiliwili of Kaupe'a.*
In 'Ewa, O'ahu. Said to be where homeless ghosts wander among the trees.

[Pukui 1983:#1666].

Beckwith (1940:154) has stressed that "the worst fate that could befall a soul was to be abandoned by its *'aumakua* and left to stray, a wandering spirit (*kuewa*) in some barren and desolate place." These wandering spirits were often malicious, so the places that they wandered were avoided.

3.3.4 The Plain of Pukaua

The Hawaiian language newspaper *Ka Loea Kālai'āina*, (January 13, 1900) relates that near Pu'uokapolei , on the plain of Pukaua, on the *mauka* side of the road, there was a large rock. This legend suggests that the plain around Pu'uokapolei was called Pukaua. The legend is as follows:

> If a traveler should go by the government road to Waianae, after leaving the village of gold, Honouliuli, he will first come to the plain of Puu-ainako and when that is passed, Ke-one-ae. Then there is a straight climb up to Puu-o-Kapolei and there look seaward from the government road to a small hill, That is Puu-o-Kapolei. . . . You go down some small inclines, then to a plain. This plain is Pukaua and on the mauka side of the road, you will see a large rock standing on the plain. . . . There were two supernatural old women or rather peculiar women with strange powers and Puukaua belonged to them. While they were down

> fishing at Kualaka'i [near BarbersPoint] in the evening, they caught these things, *'a'ama* crabs, *pipipi* shellfish, and whatever they could get with their hands. As they were returning to the plain from the shore and thinking of getting home while it was yet dark, they failed for they met a one-eyed person [bad omen]. It became light as they came near to the plain, so that passing people were distinguishable. They were still below the road and became frightened lest they be seen by men. They began to run - running, leaping, falling, sprawling, rising up and running on, without a thought of the *'a'ama* crabs and seaweeds that dropped on the way, so long as they would reach the upper side of the road. They did not go far for by then it was broad daylight. One woman said to the other, "Let us hide lest people see us," and so they hid. Their bodies turned into stone and that is one of the famous things on this plain to this day, the stone body. This is the end of these strange women. When one visits the plain, it will do no harm to glance on the upper side of the road and see them standing on the plain [*Ka Loea Kālai'āina*, January 13, 1900, translation in Sterling and Summers 1978:39].

In another version of this story, the two women met Hi'iaka as she journeyed toward the 'Ewa coast. The women were *mo'o* (supernatural beings) and were afraid that Hi'iaka would kill them, so they changed into their lizard form. One of the lizards hid in a little space on a stone beside the coastal trail, and the other hid nearby (*Ka Hōkū o Hawai'i*, February 15, 1927, translated in Maly 1997:19). From that time on the stone was known as *pe'e-kāua*, meaning "we two hidden." Hi'iaka greeted the two women but did not harm them, and passed on.

When she reached Pu'uokapolei , she also greeted two old women who lived at an *'ohai* grove on the hill. These women were named Pu'uokapolei and Nāwaineokama'oma'o (*Ka Hōkū o Hawai'i*, February 22, 1927, translated in Maly 1997:19). As she continued her travels, she looked to the ocean and saw the canoe carrying Lohi'au.

My man on the many harbored sea of Pu'uloa	*Ku'u kāne i ke awa lau o Pu'uloa*
As seen from the plain of Pe'ekāua	*Mai ke kula o Pe'ekāua ke noho*
Let us dwell upon the 'ōhai covered shore	*E noho kāua i ke kaha o ka 'ōhai*
Where the noni blossoms are twisted together	*I ka wiliwili i ka pua o ka lau noni*
Descending along Kānehili	*O ka ihona i Kānehili la*
I am winding along	*Ua hili ho'i au-e*

[*Ka Hōkū o Hawai'i*, February 22, 1927, translated in Maly 1997:20].

3.3.5 Pu'uokapolei and Kamapua'a

Pu'uokapolei was the home of Kamapua'a's grandmother, Kamaunuaniho, who was one of the three migrants from Kahiki that were ancestors to the people of O'ahu (Fornander 1919, Vol. V, Part 2:318; Kahiolo 1978:81, 107). Kamapua'a, the Hawaiian pig god once lived in Kaluanui on the windward side, but escaped to 'Ewa when he was pursued by the chief Olopana.

> Kamapua'a subsequently conquered most of the island of O'ahu, and, installing his grandmother [Kamaunuaniho] as queen, took her to Pu'uokapolei, the lesser of the two hillocks forming the southeastern spur of the Wai'anae Mountain Range, and made her establish her court there. This was to compel the people who were to pay tribute to bring all the necessities of life from a distance, to show his absolute power over all [Nakuina 1904:50-51].

Emma Nakuina goes on to note: "A very short time ago [prior to 1904] the foundations of Kamaunuaniho's house could still be seen at Pu'uokapolei." Another account (*Ka Loea Kālai'āina* January 13, 1900, from Sterling and Summers 1978:34) speaks of Kekeleaiku, the older brother of Kamapua'a, who also lived on Pu'uokapolei .

3.3.6 The Strife at Honouliuli; Kūali'i unites Hawai'i *nei* (*Mo'olelo o Kūali'i*)

The celebrated chief, Kūali'i, is said to have led an army of twelve thousand (*'ekolu mano*) against the chiefs of Ko'olauloa with an army of twelve hundred (*'ekolu lau*) upon the plains of Keahumoa (Fornander 1917 Vol. IV, Part 2:364-401). Perhaps because the odds were so skewed the battle was called off and the *ali'i* of Ko'olau ceded (*ha'awi a'e*) the districts of Ko'olauloa, Ko'olaupoko, Waialua and Wai'anae to Kūali'i. When the *ali'i* of Kaua'i heard of this victory at Honouliuli they gave Kaua'i to Kūali'i as well and thus he became possessed of all the islands (*a lilo a'e la nā moku a pau ia Kūali'i mai Hawai'i a Ni'ihau*). The strife at Honouliuli was the occasion of the recitation of a song for Kūali'i by a certain Kapa'ahulani (*Ka Pule Ana a Kapa'ahulani*). This *mele* compares the king to certain places and objects in the islands, in this instance to the first breadfruit planted by Kahai at Pu'uloa, and a pig and a woman on Pu'uokapolei, possibly a reference to Kamapua'a and his grandmother.

Not like these art thou, Ku.	*Aole I like Ku.*
Not like the pig	*Aole I like i ka puaa,*
Discerning the progeny of the god;	*I ka weke lao a ke akua,*
[Or] The breadfruit planted by Kahai.	*Ka ulu kanu a Kahai;*
Truly, have you not known	*Oi ole ka oe i ike,*
The woman with the dyed garment,	*Ka wahine pau mao*
On the top of Puuokapolei?	*I ka luna o Puuokapolei-la?*

[Fornander 1917, Vol. IV, Part 2:392-393].

A later section of this *mele* also refers to Pu'uokapolei and makes mention of the famous blue poi of Honouliuli.

O Kawelo! Say, Kawelo!	*O Kawelo-e, e Kawelo-e,*
Kawelokiki, the sharp-pointed hill,	*O Kaweloiki puu oioi,*
Hill of Kapolei.	*Puu of Kapolei-e-*
Blue is the poi which appeases	*Uliuli ka poi e piha nei-o Honouliuli;*
[the hunger] of Honouliuli.	

[Fornander 1917, Vol. IV, Part 2:400-401].

3.4 Pearl Harbor (Pu'uloa) and West Loch (Kaihu o pala'ai)

3.4.1 The "Silent Fish" of Pearl Harbor

Pearl Harbor was called Pu'uloa or *ke-awa-lau-o-Pu'uloa*, the many harbored-sea of Pu'uloa (Pukui 1983:#1686) by the Hawaiians. An alternate name was Awawa-lei, or "garland (*lei*) of harbors" (Handy and Handy 1972:469). Pukui (1983:#1126] also uses the name *Awalua* for Pearl Harbor, as in the saying "*Huhui na 'ōpua i Awalau*, The clouds met at Pearl Harbor. Said of the mating of two people." Emerson (1915:167) interprets Awalau as "leaf-shaped lagoon."

John Clark (1977:70) says that its English name came from the name Waimomi, or "water of the pearl," an alternate name for the Pearl River (Pearl Harbor). The harbor was named Pearl Harbor after the pearl oysters of the family Pteriidae (mainly *Pinctada radiata*), which were once abundant on the harbor reefs, but were later decimated by over-harvesting. This oyster was supposedly brought from Kahiki, the Hawaiian ancestral lands, by a *mo'o* (lizard or water spirit) named Kane-kua'ana (Handy and Handy 1972:470).

Kanekua'ana was the *kia'i* (food guardian) for 'Ewa. When food was scarce, the descendants of Kanekua'ana built *waihau heiau* (a *heiau* for *mo'o*) for her and lit fires to plead for her blessings. For 'Ewa the chief *i'a* (marine food) blessing was the famous *pipi*, or pearl oyster. Samuel Kamakau describes the *pipi* of Honouliuli.

> That was the oyster that came in from deep water to the mussel beds near shore, from the channel entrance of Pu'uloa to the rocks along the edges of the fishponds. They grew right on the *nahawele* mussels and thus was this *i'a* obtained. Not six months after the *hau* branches [that placed a *kapu* on these waters until the *pipi* should come up] were set up, the *pipi* were found in abundance-enough for all 'Ewa-and fat with flesh. Within the oyster was a jewel (*daimana*) called a pearl (*momi*), beautiful as the eyeball of a fish, white and shining; white as the cuttle fish, and shining with the colors of the rainbow-reds and yellow and blues, and some pinkish white, ranging in size from small to large. They were of great bargaining value (*he waiwai kumuku'ai nui*) in the ancient days, but were just "rubbish" (*'opala*) in 'Ewa [Kamakau 1991b:83].

This oyster, the *pipi*, was sometimes called "the silent fish," or *i'a hamau leo o 'Ewa*, 'Ewa's silent sea creature (Handy and Handy 1972:471), since the collectors were supposed to stay quiet while harvesting the shells, as in the sayings:

The fish of 'Ewa that silences the voice. *Ka ka'a hāmau leo o 'Ewa.*
The pearl oyster, which has to be gathered in silence [Pukui 1983:#1331].

'Ewa is disturbed by the Moa'e wind. *Haunāele 'Ewa i ka Moa'e.*

> Used about something disturbing, like a violet argument. When the people of 'Ewa went to gather the *pipi* (pearl oyster), they did so in silence, for if they spoke, a Moa'e breeze would suddenly blow across the water, rippling it, and the oysters would disappear [Pukui 1983:5#493].

Hush, lest the wind rise. *E hāmau o makani mai auane'i.*

> Hold your silence or trouble will come to us. When the people went to gather pearl oysters at Pu'uloa, they did so in silence, for they believed that if they spoke, a gust of wind would ripple the water and the oysters would vanish [Pukui 1983:#274].

The gesturing fish of 'Ewa. *Ka i'a kuhi lima o 'Ewa.*

> The *pipi*, or pearl oyster. Fishermen did not speak when fishing for them but gestured to each other like deaf-mutes [Pukui 1983:#1357].

Sereno Bishop, an early resident of O'ahu, wrote, of his time in the area around 1836, of the pearl oyster, the *pipi*, and another edible clam, identified by Margaret Titcomb (1979:351) as probably *Lioconcha heiroglyphica.*

> The lochs or lagoons of Pearl River were not then as shoal as now. The subsequent occupation of the uplands by cattle denuded the country of herbage, and caused vast quantities of earth to be washed down by storms into the lagoons, shoaling the water for a long distance seaward. No doubt the area of deepwater and anchorage has been greatly diminished. In the thirties, the small oyster was quite abundant, and common on our table. Small pearls were frequently found in them. No doubt the copious inflow of fresh water favored their presence. I think they have become almost entire extinct, drowned out by the mud. There was also at Pearl River a handsome speckled clam, of a delicate flavor which contained milk white pearls of exquisite luster and perfectly spherical. I think the clam is still found in the Ewa Lochs [Bishop 1901:87].

Older Hawaiians believed that the *pipi* disappeared around the time of the smallpox epidemic of 1850-1853, because Kanekua'ana became displeased at the greed of some *konohiki* (overseer).

> The people of the place believe that the lizard was angry because the konohikis imposed kapus [bans], were cross with the women and seized their catch of oysters. So this "fish" was removed to Tahiti and other lands. When it vanished a white, toothed thing grew everywhere in the sea, of Ewa, which the natives of Ewa had named the pahikaua (sword). It is sharp edged and had come from Kauai-helanai, according to this legend [Manu 1885:50].

Pahikaua is the Hawaiian name for the mussel, *Brachidontes crebristriatus* (Mytilidae), which was also a popular clam eaten by the residents of Pearl Harbor.

A clarification of the story of Kanekua'ana and the pearl oysters of Pearl Harbor is given, in which it seems an overseer had set a ban on the *pipi* for several months a year so that they could increase. A poor widow, a relation of the *mo'o*, took some of the *pīpi* and hid them in a basket. The *konohiki* found the hidden shells, and took them from her, emptying them back into the sea, which was proper. However, after this he followed the woman home and also demanded that she pay a stiff fine in cash, which she did not have. The *mo'o* thought this was unjust and the next night she took possession of a neighbor who was a medium.

> . . . After the overseer had gone back to Palea the lizard goddess possessed her aged keeper [a woman of Ewa] and said to those in the house, "I am taking the

> pipi back to Kahiki and they will not return until all the descendants of this man are dead. I go to sleep. Do not awaken my medium until she wakes of her own accord." The command was obeyed and she slept four days and four nights before she awoke. During the time that she slept the pearl oysters vanished from the places where they were found in great numbers, as far as the shore . . . .The few found today are merely nothing . . .[*Ka Loea Kālai'āina*, June 3, 1899, translation in Sterling and Summers 1978:49-50].

3.4.2 Ka'ahupāhau, the Queen Shark of O'ahu

Pearl Harbor in legendary traditions is closely associated with shark '*aumakua*, guardian spirits for specific Hawaiian families or clans. Pukui (1943:56) and others (Sheldon 1883) claim that the sharks of Pearl Harbor were so tame that people used to ride on their backs, and that their human relatives would feed them with *awa*. The most famous guardian shark was Ka'ahupāhau, the queen shark of O'ahu, who lived in Pu'uloa, now called Pearl Harbor. Her name means "cloak well cared for" (Pukui 1943:56), or "well cared-for feather cloak;" the feather cloak was a symbol of royalty.

Ka'ahupāhau and her brother, Kahi'uka, had been born as humans and were turned into sharks (Mary Kawena Pukui, March 29, 1954, from Sterling and Summers 1978:56).

> The mother, who was a chiefess, of Ka'ahupahau was gathering limu [seaweed] in the waters of Pearl Harbor when she had a miscarriage. Thinking the baby dead she left it in the water to be washed away. Later she went again to gather limu and was bitten by a shark. She went to a kahuna [priest] who told her that the shark was Ka'ahupahau who was her own daughter, the baby she thought was dead. The kahuna advised her to go to the place and build and ahu (heap) of hau a sort of landing from which she could feed the shark and care for it. It was from that time by command of the mother that all people of Ewa were to be always be protected from sharks whether in Pearl Harbor or outside [E.S. as told by Simeon Nawaa, Mar. 22, 1954, from Sterling and Summers 1978:56].

This explains the meaning of the shark's name Ka'ahupāhau, "the mound (*ahu*) of *hau*" (*Hibiscus tiliaceus*). The grandmother of Ka'ahupāhau and her brother, Koihala, lived in Honouliuli and one day was making *lei* for her shark grandchildren. A young girl named Pāpio rudely begged for one of the *lei*, but Koihala refused. On her way to her favorite surfing spot at Keahi Point, Pāpio snatched up one of the *lei*, and laughingly went surfing. Koihala angrily told Ka'ahupāhua about the stolen *lei*, and the shark killed the girl, grabbing her from a rock in the sea where she was resting.

> Ka'ahupahau soon recovered from her anger and became very sorry. She declared that from hence forth all sharks in her domain should not destroy, but protect the people round about. As flowers were the cause of the trouble she forbade their being carried or worn on the water of Pu'uloa. From that time all the people of that locality and the sharks in the lochs were the best of friends . . . . [Pukui 1943:56].

In a second version of this story, the shark gods Kanehunamoku and Kamohoali'i were the ones that had placed a *kanawai* (decree) against the attack of men by all sharks around O'ahu. As the result of the attack of the chiefess Pāpio, Ka'ahupāhau was put on trial and tried at Uluka'a [the realm of the gods]. She escaped the punishment of death, but was placed in confinement. In his writing of 1870 (*Ke Au 'Oko'a* April 7, 1870), Samuel Kamakau asserted:

> After her confinement ended several years later Ka'ahupahau was very weak. She went on a sightseeing trip, got into trouble, and was almost killed. But she received great help from Kupiapia and Laukahi'u, sons of Kuhaimoana, when their enemies were all slain the *kanawai* was firmly established. This law-that no shark must bite or attempt to eat a person in Oahu waters-is well known from Pu'uloa to the Ewas. Anyone who doubts my work must be a *malihini* [recent resident] there. Only in recent times have sharks been known to bite people in Oahu waters or to have devoured them; it was not so in old times [Kamakau 1991b:73].

This information on the protective nature of Ka'ahupāhau is somewhat contradicted by the writings of the Russian explorer Otto Von Kotzebue, who walked to Pearl Harbor in 1821, but was unable to actually sail on the waters. He was told that people were thrown into the water as sacrifices to the sharks; however, it is uncertain if the person who told him this was an actual resident of 'Ewa, who would know the real truth. Kotzebue's account is:

> In the Pearl River there are sharks of remarkable size, and there have made on the banks an artificial pond of coral stones, in which a large shark is kept, to which, I was told, they often threw grown-up people, but more frequently children, as victims [Kotzebue 1821:338-348].

The protection of Ka'ahupāhau is emphasized in many other Hawaiian traditions. One time a man-eating shark called Mikololou from the Ka'ū district of the island of Hawai'i, came visiting at Pearl Harbor with other sharks, some man-eating, some not. Mikololou remarked "What fine, fat crabs you have here," from which Ka'ahupāhau knew that some of the sharks were man-eaters, since they referred to fishermen as "fat crabs." She directed the fishermen to place a barrier of nets across the entrance to the harbor, and when the sharks left her home, they could not get back out to the ocean.

> The sharks of the lochs attacked the man-eaters from outside and beat them unmercifully. A shark from Ka'u, Hawaii, who was not a man-eater, threw his weight over the nets and pressed them down. His sons changed themselves into pao'o [blennies] fishes and leaped where the net was forced down, thus escaping from the place where the battle of sharks was raging. Mikololou was caught fast in the nets and dragged ashore where his head was cut off and his body burned [Pukui 1943:56].

In another version of this story, Mikololou is accompanied to Pearl Harbor with his shark friends Kua, Keali'ikauaoka'ū, Pākaiea, and Kalani; Mikololou was the only man-eater. To escape the nets:

> Keali'ikauaoka'ū changed himself into a pao'o fish, which lives among the rocks, and leapt out of the net. Kua changed into a lupe, as the spotted stingray is called, and weighted down the net on one side, helping his son Kalani and nephew Pākaiea, who were half human, to escape [Pukui and Green 1995:40].

Only Mikololou was caught in the nets, and his body was tossed on shore to rot, until only the tongue was left. In some versions of this story, the tongue immediately jumps into the water and then becomes a shark again (Pukui and Green 1995:41); in other versions (Pukui 1943:56), the tongue is eaten by a dog, which then jumps into the water, turns into a shark, and escapes. In both versions, Mikololou returns to Ka'ū, never to bother Ka'ahupāhau again.

In Thrum's (1923:308) version, Mikololou went back to his home island of Hawai'i and organized an army of sharks to return to Pearl Harbor, but he was again defeated by the fishermen of 'Ewa under the command of Ka'ahupāhau, who slaughtered so many of the sharks that from then on "the sea of Pu'uloa is safe and peaceful through her law that sharks shall not attack man. That is why these waters are safe for people to swim from shore to shore without fear" (Thrum 1923:308). The watchful eye of Ka'ahupāhau led to these Hawaiian sayings:

Everywhere in Pu'uloa is the trail…of Ka'ahupāhau — *Alahula Pu'uloa, he alahelena Ka'ahupāhau*

Said of a person who goes everywhere, looking, peering, seeing all, or of a person familiar with every nook and corner of a place. Ka'ahupāhau is the shark goddess of Pu'uloa (Pearl Harbor) who guarded the people from being molested by sharks. She moved about, constantly watching [Pukui 1983:#105].

The man-eating sharks blamed Ka'ahupāhau. — *Ho'ahewa na niuhi ia Ka'ahupāhau.*

Evil-doers blame the person who safeguards the rights of others. Ka'ahupāhau was the guardian shark goddess of Pu'uloa (Pearl Harbor) who drove out or destroyed all the man-eating sharks [Pukui 1983:#1014].

Pu'uloa became lonely when Ka'ahupāhau went away. — *Mehameha wale no o Pu'uloa, i ka hele a Ka'ahupāhau.*

The home is lonely when a loved one has gone. Ka'ahupāhau, guardian shark of Pu'uloa (Pearl Harbor), was dearly loved by the people [Pukui 1983:#2152].

Mikololou died and came to life again… through his tongue. — *Make o Mikololou a ola i ke ale lo.*

Said of one who talks himself out of a predicament [Pukui 1983:#2111].

There were other guardian sharks in Pearl Harbor, including a brother of Ka'ahupāhau's named Kahi'ukā (the smiting tail), and a son name Kūpīpī (Pukui 1943:57), or, in some versions, twin sons, named Kūpīpī and Kūmaninini (Pukui and Green 1995:41). In one version of the

Story of Pāpio, recounted above, it is said the Ka'ahupāhau later turned into a stone, although the people of Pu'uloa continued to feed her (Martha Beckwith notes to Samuel Kamakau n.d., *Mo'olelo Hawaii*, vol. II:23, from Sterling and Summers 1978:56).

> Kahi'ukā was the brother of Ka'ahupahau. The name means "smiting tail." This shark was called by this name because it was his duty to warn the people of Ewa of the presence of strange and unfriendly sharks in these waters and he did so by nudging them or striking at them with his tail When ever anyone was fishing and felt a nudge they would know it was Kahi'uka, warning them and they would leave the water immediately [E.S. as told by Simeon Nawaa, Mar. 22, 1954, from Sterling and Summers 1978:56].

There are two different accounts of the home of this shark brother. The above reference says that Kahi'uka lived at the site of the old dry dock. Mary Pukui disagrees, and says the site of the old dry dock was the home of the son, not the brother of Ka'ahupāhau. Mary Pukui says Kahi'ukā lived in a cavern under water off Moku'ume'ume (Ford Island) near Keanapua'a Point; he had a stone form in deep water some distance from the cave that could be seen from the surface (Mary Kawena Pukui, Mar. 29, 1954, from Sterling and Summers 1978:56). J. S. Emerson (1892) wrote in the late nineteenth century that Kahi'uka's keeper, Kimona, would often find fish nets missing and knew that Kahi'ukā had carried them upshore to a place of safety. Pukui also relates that the shark was named "smiting tail" because one side was longer than the other, and the shark would use his tail to smite unfriendly sharks.

3.4.3 Story of Ka'ehu-iki-manō-o-Pu'uloa, the Little Yellow Shark

One of the shark '*aumakua* associated with Pearl Harbor, was the little yellow shark called Ka'ehu, who was born on the Big Island, but later traveled to O'ahu and settled at Pu'uloa. His ancestor was Kama'ili'ili, the Hawaiian shark god, brother of the Hawaiian volcano goddess, Pele. Ka'ehu was a guardian of the Hawaiian people and once saved several surf riders at Waikīkī from a man-eating shark called Pehu (Knudsen 1946:9-13; Westervelt 1963:55-58).

In Thrum's version of this legend, the shark's name is Ka-ehu-iki-mano-o-Puuloa, meaning "the small, blonde shark of Pu'uloa." He was born in Puna, Hawai'i, but soon left on a tour of all of the islands, so that he could call and pay respects to all of the king-sharks of Hawai'i.

> . . . Puuloa, Oahu, was the next objective. Reaching its entrance they visited the pit of Komoawa, where Kaahupahua's watcher lived. Here the young shark made himself known, as usual; the object of the journey, and the desire to meet the famous queen-shark protector of Oahu's waters. . . . Welcome greetings were sent by the messenger, who was bid entertain the visitors in the outer cave, and on the morrow the party could come up the lochs to meet the queen. . . .The company then repaired to the royal cave at Honouliuli, where the visitors were supplied with soft coconut and *awa*, their home food and beverage [Thrum 1923:301-302].

The cave of Komoawa may be the Hawaiian words for "channel" or harbor" entrance (Pukui and Elbert 1986). In another version of this story, the shark watcher himself is named Komoawa and the cave that he lives in is called Keaali'i. Keaali'i guards the entrance to Pearl Harbor,

while the home of Ka'ahupāhau is deeper into Honouliuli lagoon (*Saturday Press*, Dec. 29, 1883).

In 1823, the missionary Hiram Bingham accompanied Liholiho (King Kamehameha II) and his company to the royal compound at Pu'uloa, where he was shown a cave that was home to a shark god.

> I one day accompanied the king and others by boat to see the reputed habitation of an Hawaiian deity, on the bank of the lagoon of Ewa. It was a cavern or fissure in a rock, chiefly under water, where, as the traditions teach, and as some then affirmed, a god, once in human form, taking the form of a shark, had his subterraqueous abode. Sharks were regarded by the Hawaiians as gods capable of being influenced by prayers and sacrifices, either to kill those who hate and despise them, or to spare those who respect and worship them . . . [Bingham 1847:177].

Although Bingham stated in this year that no one any longer believed these stories, there were some who kept the beliefs of the guardian sharks alive. In 1912, dredging in Pearl Harbor was completed and a large drydock was completed, but collapsed the very next year. The native Hawaiians believed that the dock had collapsed because it had been built over the home of Kūpipi the shark son of Ka'ahupāhau's, who lived in a cavern near the harbor entrance at Pu'uloa. "Angered by the violation of his home, the shark prince destroyed the imposing structure" (Clark 1977:69-70). The dock was rebuilt in the same year, but this time only after a blessing on the construction was made by Hawaiian traditional practioners.

In other versions of this story, the name of the shark is interpreted as "the little ruddy shark" (Emerson n.d.), or the "little reddish-haired shark," named for the reddish ('*ehu*) hair of Ka'ahupāhau. In this version, the cave of Ka'ehu is called Pānau, and the human mother and father of the little shark are Kapukapu and Holei of Pānau, in Puna, Hawai'i (Emory et al. 1959:63).

3.4.4 Kāne and Kanalao and the Fish Ponds of West Loch

According to an account in the Hawaiian newspaper *Ka Loea Kālai'āina* (June 10, 1899), several of the fishponds in the Pu'uloa area were made by the brother gods, Kāne and Kanaloa. A fisherman living in Pu'uloa, named Hanakahi, prayed to unknown gods, until one day two men came to his house. They revealed to him that they were the gods to whom he should pray. Kāne and Kanaloa then built fishponds at Ke'ana-pua'a, but were not satisfied. Then they built the fishpond, Kepo'okala, but were still not satisfied. Finally they made the pond Kapākule, which they stocked with all manner of fish. They gifted all of these fishponds to Hanakahi and his descendants (Handy and Handy 1972:473; *Ka Loea Kālai'āina*, July 8, 1899).

According to Mary Pukui (1943:56-57), who visited Kapākule fishpond when she was young, the pond was built by the legendary little people of Hawai'i, the *menehune*, under the direction of the gods Kāne and Kanaloa. Pukui describes several unique aspects of this pond:

> On the left side of the pond stood the stone called Hina, which represented a goddess of the sea by that by that name. Each time the sea ebbed, the rock became

> gradually visible, vanishing again under water at high tide. Ku, another stone on the right, was never seen above sea level. This stone represented Ku'ula, Red Ku, a god for fish and fishermen. From one side of the pond a long wall composed of driven stakes of hard wood, ran toward the island [Laulaunui] in the lochs. When the fish swam up the channel and then inside of this wall, they invariably found themselves in the pond. A short distance from the spot where the pond touched the shore was a small koa or altar composed of coral rock. It was here that the first fish caught in the pond was laid as an offering to the gods [Pukui 1943:56].

The fishpond contained many fish, especially the *akule* (scad fish, *Trachurops crumenophthalmus*), thus its name, "the enclosure for *akule* fish" (Pukui 1943:56-57). The pond was destroyed when the channel to Pearl Harbor was dredged in the early twentieth century. The caretaker of the pond took the stones Kū and Hina to a deep place in the ocean and sunk them so "none would harm or defile them." Cobb (1903:733) says it was used to catch the larger *akule* (goggler), *opelu* (mackeral scad), *weke* (goat fish), *kawakawa* (bonito), and sharks; it was unusual for having walls made of coral. This contradicts much of the legendary material that says that sharks were not killed within Pearl Harbor; however, Kamakau does relate that Kekuamanoha and Kauhiwawaeono, two conspirators against Kamehameha I, lived at Pu'uloa. The chief Kauhiwawaeono was known to murder people and use their bodies as shark bait (Kamakau 1961:182, 232).

Samuel Kamakau adds more information on the pond Kapākule, and a second one called Kepo'okala.

> At Pu'uloa on Oahu were two unusual ponds [fish traps]—Kapakule and Kepoolala. Kapakule was the better one. The rocks of its walls, *kuapa*, could be seen protruding at high tide, but the interlocking stone walls (*pae niho pohaku*) of the other pond were still under water at high tide. . . . It [Kapakule] was said to have been built by the *'e'epa* people [mysterious people] at the command of Kane....This is how the fish entered the pond. At high tide many fish would go past the mauka side of the pond, and when they returned they would become frightened by the projecting shadows of the trunks, and would go into the opening. The fish that went along the edge of the sand reached the seaward wall, then turned back toward the middle and entered the *anapuna* (the arched portion of the trap) A man ran out and placed a "cut-off" seine net (*'omuku lau*) in the opening, and the fish shoved and crowded into it. The fish that were caught in the net were dumped out, and those not caught in the net were attacked with sharp sticks and tossed out, or were seized by those who were strong [Kamakau 1976:88].

3.4.5 The Story of Kaihuopala'ai Pond, Honouliuli (*Ka'ao no Maikohā*)

In the Legend of Maikohā (Fornander 1917, Vol. V, Part 2:270-271), a sister of Maikohā, a deified hairy man who became the god of *tapa* makers, named Kaihuopala'ai, journeys to O'ahu:

> Kaihuopala'ai saw a goodly man by the name of Kapapaapuhi who was living at Honouliuli, 'Ewa; she fell in love with him and they were united, so

> Kaihuopala'ai has remained in 'Ewa to this day. She was changed into that fishpond in which mullet are kept and fattened, and that fish pond is used for that purpose to this day,
>
> *'Ike aku la o Kaihuopala'ai i ka maikai o Kapapaapuhi, he kāne e noho ana ma Honouliuli ma 'Ewa. Moe iho la lāua, a noho iho la o Kaihuopala'ai i laila a hiki i kēia lā. 'Oia kēlā loko kai e ho'opuni ia nei i ka 'anae, nona nā i'a he nui loa, a hiki i kēia kākau ana* [Fornander 1919, Vol. V, Part 2:270].

The name of Maikohā's sister, Kaihuopala'ai, which means "the nose of Pala'ai" (Pukui et al. 1974:68) is also the name the Hawaiians used for the west loch of Pearl Harbor, adjacent to the Project Area. McAllister recorded that other Hawaiians say there never was a fishpond by that name Beckwith (1918) says that Kaihuopala'ai changed into the fishpond near Kapapapuhi, which means "the eel flats." This is identified on old maps as the point north of the Project Area (sometimes spelled Kapapa'apuhi) that juts into the loch; early Hawaiian settlement was focused on this area.

There is also a famous *pōhaku*, or rock, associated with the traveling mullet of Pearl Harbor.

> . . .I . . .asked the person sitting on my left, "What place is this?" Answer – "This is Pearl City." It was here that mullets were bred in the ancient times and that flat stone there was called Mullet Rock or Pōhaku Anae. It lies near the beach by Ewa mill [*Ka Nūpepa Kū'oko'a*, Oct. 2, 1908, from Sterling and Summers 1978:53].

3.4.6 The Traveling Mullet of Honouliuli (Fish Stories and Superstitions)

The story of Kaihuopala'ai, or Ihuopala'ai, is also associated with the tradition of the *anae-holo*, the traveling mullet of Pearl Harbor (Thrum 1998:270-272):

> The home of the '*anae-holo* is at Honouliuli, Pearl Harbor, at a place called Ihuopala'ai. They make periodical journeys around to the opposite side of the island, starting from Pu'uloa and going to windward, passing successively Kumumanu, Kalihi, Kou, Kālia, Waikīkī, Ka'alāwai, and so on, around to the Ko'olau side, ending at Lā'ie, and then returning by the same course to their starting point [Thrum 1998:271].

In Thrum's account, Ihuopala'ai is a male who possesses a Kū'ula or fish god that supplied the large mullet known as "*anae*." His sister lived in Lā'ie, and there came a time when there were no fish to be had. She sent her husband to visit Ihuopala'ai, who was kind enough to send the fish following his brother-in-law on his trip back to Lā'ie.

This story is associated with a proverb or poetical saying identified with Honouliuli:

The fish fetched by the wind. *Ka I'a hali a ka makani*

> The '*anaeholo*, a fish that travels from Honouliuli, where it breeds, to Kaipāpa'u, on the windward side of O'ahu. It then turns about and returns to its original home. It is driven closer to shore when the wind is strong [Pukui 1983:#1330].

Pukui et al. (1974:68) gives the name of the husband in this story as Lā'ie and the name of the wife as Pala'ai, which ties into the name of the west loch of Pearl Harbor, called Ka-ihu o Pala'ai, "the nose of Pala'ai." Another version has a woman named Awawalei (an alternate version for the name of Pearl Harbor), who had a brother named Laniloa (the point on Lā'ie at which the mullet stops its migration and makes its way back to Pearl Harbor), and another brother (a mullet) who lived with an eel named Papa-puhi, which relates to the name of the fishpond in the tale called Kapapapuhi (*Ka Loea Kālai'āina*, Oct. 21, 1899). On historic maps, Kapapapuhi is a point of land that juts into West Loch and was a focus for habitation, taro cultivation, and fishpond maintenance in the early post-Contact (and probably earlier) period.

3.4.7 The Caves of Pu'uloa

'Ewa was famous for the many limestone caves formed in the uplifted coral. Some of these caves, called *ka-lua-ōlohe* were inhabited by the *ōlohe*, a type of people that looked like other humans but had tails like dogs (Beckwith 1940:343). These people were skilled in wrestling and bone-breaking and often hid along narrow passes to rob travelers; they were also reputed to be cannibals. As mentioned in a previous section of this report, the famous cannibal king, Kaupe, who lived in Līhu'e in upland Honouliuli, was an *ōlohe*.

There was once a cave named Kapuna on Waipi'o peninsula that was associated with a famous riddle. *No Kapuna kane hale noho ia e ke kai*, or "To Kapuna belongs the house, the sea dwells in it."

> This cave is on the Waipio side and a sea passage separates Waipio and Waikele and Waikele and Honouliuli. The passage is obstructed by three small islands, a middle one and Manana and Laulaunui. These small islands in the middle of the passage to Honouliuli and inside and outside of these small islands is the sea of Kaihuopalaai [Hawaiian name for West Loch] where mullet lived till they whitened with age [*Ka Loea Kālai'āina*, Oct. 7, 1899, translation in Sterling and Summers 1978:24].

Another famous cave of the area was Keanapua'a [in Halawa opposite Waipi'o peninsula], which means "the pig's cave," so named because Kamapua'a once slept there (Pukui et al. 1974:103). This cave was one of the places that the high king of O'ahu, Kahahana, hid after he had killed the priest Kaopulupulu, thus angering the high chief of Maui, Kahekili (Kahahana's father).

> Upon the arrival here at Oahu of Kahekili, Kahahana fled, with his wife Kekuapoi, and friend Alapai, and hid in the shrubbery of the hills. They went to Aliomanu, Moanalua, to a place called Kinimakalehua; then moved along to Keanapuaa and Kepookala, at the lochs of Puuloa, and then from there to upper Waipio; thence to Wahiawa, Helemano, and on to Lihue; thence they came to Poohilo, at Honouliuli, where they first showed themselves to the people and submitted themselves to their care.
>
> Through treachery, Kahahana was induced to leave Po'ohilo, Honouliuli and was killed on the plains of Hō'ae'ae [Thrum 1906:213-214].

The place Pō'o Hilo was somewhere on the border between Honouliuli and Hō'ae'ae (north of the Project Area). In the "Legend of the Sacred Spear-point" (Kalākaua 1990:209-225) is a reference to the Hawai'i Island chief, Hilo-a-Lakapu. Following his unsuccessful raid against O'ahu "he was slain at Waimano, and his head was placed upon a pole near Honouliuli for the birds to feed upon"(Kalākaua 1990:224). This place was called Pō'o Hilo, which literally means "the head of Hilo."

The caves of Pu'uloa were sometimes used as burial caves. In 1849, Keali'iahonui, son of Kaua'i's last king, Kaumuali'i, died. He had once been married to the chiefess Kekau'ōnohi, who had stayed with him until 1849. She wanted to bury her ex-husband at sea.

> It seems that by Kekauonohi's orders, the coffin containing her late husband's remains was removed to Puuloa, Ewa, with the view of having it afterwards taken out to sea and there sunk. It was temporarily deposited in a cavern in the coral limestone back of Puuloa, which has long been used for a burial place, and has lately been closed up [Alexander 1907:27].

After some initial objections by the niece of Kealai'iahonui, the body was removed from the outer coffin, the rest was sunk, and the coffin was later buried somewhere in Pu'uloa.

3.4.8 Coastal Honouliuli

The coastal area of Honouliuli is a triangular area that stretches from Pili o Kahe on the northwestern corner that marks the boundary with the Wai'anae District to Kalaeloa (now Barbers Point) on the southwestern corner, to Keahi Point on the southeastern corner at the mouth of Pearl Harbor. There were likely Hawaiian settlements at Ko'ōlina on the west side, at Kualaka'i on the south, at the royal residence in Pu'uloa near the mouth of the harbor, and at Honouliuli town at the upper end of West Loch, surrounding Kapapapuhi Point, north of the Project Area.

Kalaeloa literally means "the long point" (Pukui et al. 1974:72), but Raphaelson (1925) has a different translation. He says the name of the point is Kalaiekao, meaning "sky rocket cape," because it was on this point that signal fires were set to signal canoes to go out to meet European boats during the early historic period. Kalaeloa Point was the home of Uhu makaikai, a *kupua* (supernatural being) who could take the form of a man or a giant parrotfish (*uhu*). He is mentioned in several legends concerning the hero Kawelo and his struggles with the ruling chief of Kaua'i, Aikanaka.

> This friend was Kauahoa also an alii of Wailua (Kauai). Their king, Aikanaka, in the time of Kākuhihewa of Oahu and Lonoikamakahiki of Hawaii. Aikanaka got offended with Kawelo and sent him to live at Waikiki. The king at a surf bathing told Kawelo to get a calabash of water for him to wash off with, but on Kawelo's failing to do it, he took a calabash of soft poi and threw it over Kawelo and sent him off as already stated. At Waikiki, Kawelo studied the art of fighting to be revenged on Aikanaka. A *kupua*, Uhu makaikai, a fish was his teacher. Makuakeke was his helper in the canoe. The fish lived at Pōhaku o Kawai near Kalailoa (Kalaeloa), Oahu (BarbersPoint) . . . . [Hawaiian Ethnological Notes, Bishop Museum Vol. II:114, translation in Sterling and Summers 1978:41].

One historical account of particular interest refers to an *ali'i* residing in Ko'ōlina, within Waimanalo (meaning "brackish water").

> Ko'ōlina is in Waimānalo near the boundary of 'Ewa and Wai'anae. This was a vacationing place for chief Kākuhihewa and the priest Napuaikamao was the caretaker of the place. Remember reader, this Ko'ōlina is not situated in the Waimānalo on the Ko'olau side of the island but the Waimānalo in 'Ewa. It is a lovely and delightful place and the chief, Kākuhihewa loved this home of his [*Ke Au Hou* July 13, 1910, from Sterling and Summers 1978:41].

Between Pili o Kahe and Kalaeloa there is Kahe Point, which was formerly marked by two drainage ditches called Keone'ō'io and Limaloa, which may explain the name Kahe, which means "flow" (Pukui et al. 1974:64). Keone'ō'io means "the *'ō'io* sand; this area once had large schools of *'ō'io* (bonefish; Albulidae), a fish usually found on sandy-bottom areas (Clark 1977:77). Kalaeloa, meaning "the long point", got its present name Barbers Point from Captain Henry Barber of the brig *Arthur*, who ran aground on October 31, 1796 on a shoal west of the entrance to Pearl Harbor. Hawaiians, under the command of Kamehameha I, salvaged the cannon from the ship and used them to man a new fort on Lahaina, Maui (Clark 1977:75-76).

Kualaka'i is the name of the beach area on the south ocean coast of Honouliuli. Clark (1977:74) says it is named for a type of sea cucumber that squirts a purple fluid when squeezed, but, the book *Hawaiian Place Names* (Pukui et al. 1974:119) identifies the sea creature as 'tethys," a member of the invertebrate family Aplysiidae, commonly called sea hares. In the legend of Hi'iaka, there was a spring located at Kualaka'i named Hoaka-lei (*lei* reflection) where Hi'iaka picked *lehua* flowers to make a *lei* and saw her reflection in the water (*Ka Hōkū o Hawai'i*, February 22, 1927, translated in Maly 1997:20).

Keahi Point, at the entrance to Pearl Harbor, has already been noted as the surf spot for the chiefess Pāpio who was killed by the queen shark of Pearl Harbor, Ka'ahupāhau. It was also known as a good fishing spot for the *'ō'io* (bonefish, *Albula vulpes*). The *'ō'io* from Keahi were famed for their fragrance, like that of the *līpoa* (*Dictyopteris* spp.) seaweed (Pukui 1943:56).

In pre-Contact times, Pu'uloa was an *'ili* of Honouliuli, but sometime after 1868, it was designated as a separate *ahupua'a* (Maly 1997:9). Pu'uloa was a royal habitation area, and according to one tradition, was the first place that "human beings" landed on O'ahu (Beckwith 1940:343). Within Pu'uloa (meaning "long hill') on the seashore side was a beach area called One'ula, which means "red sand," possibly named for a large drainage ditch which carried red dirt from the inlands to the seashore (Clark 1977:73).

3.4.8.1 The Strife of Nāmakaokapāo'o and Puali'i (*Ka'ao no Nāmakaokapāo'o*)

In the Legend of Nāmakaokapāo'o (Fornander 1919, Vol. V, Part 2:274-277), the brave boy, Nāmakaokapāo'o, and his mother, Pokai, appear to have been living near the coast but were quite destitute (*'ilihune loa*). His mother met Puali'i when he came from Līhu'e to fish at Honouliuli, the two married, and the new family went to live on the plains of Keahumoa (*ke kula o Keahumoa*). Puali'i kept sweet potato patches (*māla uala*) and fished for *ulua*. Following a dispute over sweet potatoes, Nāmakaokapāo'o defeated his step-father, Puali'i and:

> Nāmakaokapāo'o picked up Puali'i's head and threw it towards Waipouli, a cave situated on the beach at Honouliuli (a distance of about five miles).
>
> *Lālau aku la o Nāmakaokapāo'o i ke po'o o Puali'i a kiola aku la i kai o Waipouli, he ana ma kahakai o Honouliuli, o kona loa, 'elima mile ka loa* [Fornander 1919, Vol. V, Part 2:276-277].

3.4.8.2 Coastal Village of Kualaka'i

In the Legend of the Children, is a tale that foretold the later breaking of the eating *kapu* by the *ali'i*. A young brother and sister always fished at Kualaka'i, a beach area on the southern coast of Honouliuli. One day they laid out their nets, but all they caught was one *palani* (surgeonfish), a fish that was *kapu* (tabu) for men; only women could eat it.

> . . . They fished again and again until the afternoon and nothing was caught. The children were weary and went home without fish. When they came as far as Pu'u-o-Kapolei where the blossoms of the ma'o looked golden in the sunlight, the sister sat down to make ma'o leis for themselves. When the leis were made they went across the breadth of Kaupe'a to Waipio [*Ka Loea Kālai'āina*, July 22, 1899:15; translation in Sterling and Summers 1978:7].

They stopped at the stream of Ka'aimalu on the way to their home, and the sister convinced her brother to share the fish between the two, thus breaking the *kapu*. "Because these children ate fish secretly, the spot is called Ka'ai-malu (Secret eating) to this day" (Sterling and Summers 1978:7). This legend also shows the relation of several landmarks on the coastal plain, as the children travel from the coast at Kualaka'i, across the plain of Kaupe'a to Waipi'o, passing next to Pu'uokapolei .

3.4.8.3 Pu'uloa and the Breadfruit

Pu'uloa was noted as one of the first places to have breadfruit. It was brought to the islands by Kaha'i, son of Ho'okamali'i and grandson of Moikehā, who brought the plant from Upolu (central Polynesia) to Hawai'i and planted it at Pu'uloa (Beckwith 1940:97).

Two other versions can be found in Fornander. In the first, the location of the first planting is in Pu'uloa, but does not mention Kaha'i (Fornander 1919, Vol. V, Part 3:678):

> At Puuloa, Oahu. Its breadfruit plant came from Kanehunaamoku [a mythical land supposed to have been hidden by the god Kāne], brought by two men at Puuloa who were out fishing and were blown off by a heavy wind and rainstorm and landed at the uninhabited land, save gods only. Therefore by them it was introduced at Puuloa and planted in a large excavation where it grew and bore fruit, which they ate.
>
> *Ma Puuloa i Oahu. Ko laila ulu no Kanehunamoku mai, na kekahi mau kanaka o Puuloa i hele i ka lawaia a puhia e ka ino nui, makani a me ka ua, a pae i keia aina kanaka ole, he akua wale no; nolaila mai ka laua lawe ana mai i keia ulu a hiki i Puuloa, kanu a ulu i kekahi lua niu a hua, ai keia mau kanaka.*

[Fornander 1919, Vol. V, Part 3:678-679].

A second version associates the breadfruit tree in 'Ewa to the chief Namaka-o-ka-paoo, the Hawaiian born son of Ka-ulu-o-kaha'i, which means "Breadfruit of Kaha'i." Kauluokaha'i had left O'ahu to return to his ancestral lands of Kahiki (Hawaiian ancestral land). Once Namakaokapa'o had conquered the island of O'ahu, he wanted to travel to Hawai'i in secret to spy on the land.

> . . . He [Namakaokapaoo] then went and got a small gourd wherein to place his garments which his father had left him. This gourd was deposited at Kualakai, where a breadfruit tree is standing to this day. This is the breadfruit impersonation of his father, Kahaiulu. When the real person went home the breadfruit tree remained, being in the supernatural state.
>
> *. . .Alaila, kii aku la ia he wahi hokeo waiho kapa nona, na kona makuakane i waiho nona. O kahi i waiho ai ua wahi hokeo la, makai o Kualakai, oia kela ulu e ku nei a hiki i keia la ma Kualakai. Oia ke kino ulu o kona makuakane o Kahaiulu. Hoi ke kino maoli, koe ke kino ulu, ma ke ano akua keia kino* [Fornander 1919, Vol. V, Part 2:279-280].

Section 4 Historic Background

4.1 Pre-Contact and Early Post-Contact Period

By ca. A.D. 1320, 'Ewa, along with Kona, and Ko'olaupoko were the dominant polities, ruled by the sons of a chief named Māweke (Cordy 2002:21). 'Ewa at this time included the traditional districts of 'Ewa, Wai'anae, and Waialua (Fornander 1880:48). Around A.D. 1400, the entire island was ruled by King La'akona; chiefs within his line, the Māweke-Kumuhonua line, reigned until about A.D. 1520-1540, with their major royal center in Līhu'e, in 'Ewa. (Cordy 2002:24). Haka was the last chief of the Māweke-Kumuhonua line; he was slain by his men at the fortress of Waewae near Līhu'e (Kamakau 1991a:54-54; Fornander 1880:88). Power shifted between the chiefs of different districts from the 1500s until the early 1700s, when Kūali'i achieved control of all of O'ahu by defeating the Kona chiefs, then the 'Ewa chiefs, and then expanding his control on windward Kaua'i. Peleiholani, the heir of Kūali'i, gained control of O'ahu ca. 1740, and later conquered parts of Moloka'i. He was ruler of O'ahu until his death in ca. 1778 when Kahahana, of the 'Ewa line of chiefs was selected as the ruler of O'ahu (Cordy 2002:24-41).

After Kamehameha's O'ahu victory, he gave the *ahupua'a* of Honouliuli to Kalanimōkū as part of the *panalā'au*, or conquered lands, with the right to pass the land on to his heirs rather than having it revert to Kamehameha (Kame'eleihiwa 1992:58, 112). Kalanimōkū subsequently gave the *ahupua'a* to his sister, Wahinepi'o.

Various Hawaiian legends and early historical accounts indicate that the *ahupua'a* (land division) of Honouliuli was once widely inhabited by pre-contact populations, including the Hawaiian *ali'i* (chiefly class). This would be attributable for the most part to the plentiful marine and estuarine resources available at the coast, along which several sites interpreted as permanent habitations and fishing shrines have been located. Other attractive subsistence-related features of the *ahupua'a* include irrigated lowlands suitable for wetland taro cultivation, as well as the lower forest area of the mountain slopes for the procurement of forest resources. Handy and Handy report:

> The lowlands, bisected by ample streams, were ideal terrain for the cultivation of irrigated taro. The hinterland consisted of deep valleys running far back into the Ko'olau range. Between the valleys were ridges, with steep sides, but a very gradual increase of altitude. The lower part of the valley sides were excellent for the cultivation of yams and bananas. Farther inland grew the 'awa for which the area was famous. [1972:429]

In addition, breadfruit, coconuts, *wauke*, bananas, and *olona* and other plants were grown in the interior. 'Ewa was known as one of the best areas to grow gourds and was famous for its *mamaki*. It was also famous for a rare taro called the *kai o 'Ewa*, which was grown in mounds in marshy locations (Handy and Handy 1972:471). The cultivation of this prized and delicious taro led to the saying:

He has eaten the Kāī-koi taro of 'Ewa. *Ua 'ai i ke kāī-koi o 'Ewa.*

> Kāī is O'ahu's best eating taro; one who has eaten it will always like it. Said of a youth of a maiden of 'Ewa, who, like the Kāī taro, is not easily forgotten [Pukui 1983:#2770].

The lochs of Pearl Harbor were ideal for the construction fishponds and fishtraps. Forest resources along the slopes of the Wai'anae Range probably acted as a viable subsistence alternative during times of famine and/or low rainfall (Handy 1940:211; Handy and Handy 1972:469-470). The upper valley slopes may have also been a resource for sporadic quarrying of basalt used in the manufacturing of stone tools. At least one probable quarrying site (SIHP site 50-80-12-4322) is present in Maka'īwa Gulch at 152 m (500 ft) above mean sea level (Hammatt, Robins, et al. 1990).

John Papa 'Ī'ī describes a network of Leeward O'ahu trails (Figure 6), which in historic times encircled and crossed the Wai'anae Range, allowing passage from Lualualei to Honouliuli by three different trails ('Ī'ī 1959:96-98). The coastal trail skirted Pearl Harbor, passing by Pu'uokapolei ; this would have been the nearest of three Honouliuli trails to the current Project Area. Following 'Ī'ī's description, a portion of this trail network, would have passed close to the existing Farrington Highway, near the northern border of the Project Area, as seen in an 1825 map

The trail is described by 'Ī'ī as:

> The trail went down to the stream and up again, then went above the taro patches of Waiau, up to a *makai* field, to Waimano, to Manana, and to Waiawa; then to the stream of Kukehi and up to two other *maika* fields, Pueohulunui and Haupuu. At Pueohulunui was the place where a trail branched off to go Waialua and down to Honouliuli and on to Waianae. As mentioned before, there were three trails to Waianae, one by way of Pu'u o Kapolei, another by way of Pohakea, and the third by way of Kolekole ['Ī'ī 1959:97].

Early historical accounts of the general region typically refer to the more populated areas of the 'Ewa district, where missions and schools were established and subsistence resources were perceived to be greater. However, the presence of archaeological sites along the barren coral plains and coast of southwest Honouliuli Ahupua'a, indicate that prehistoric and early historic populations also adapted to less inviting areas, despite the environmental hardships.

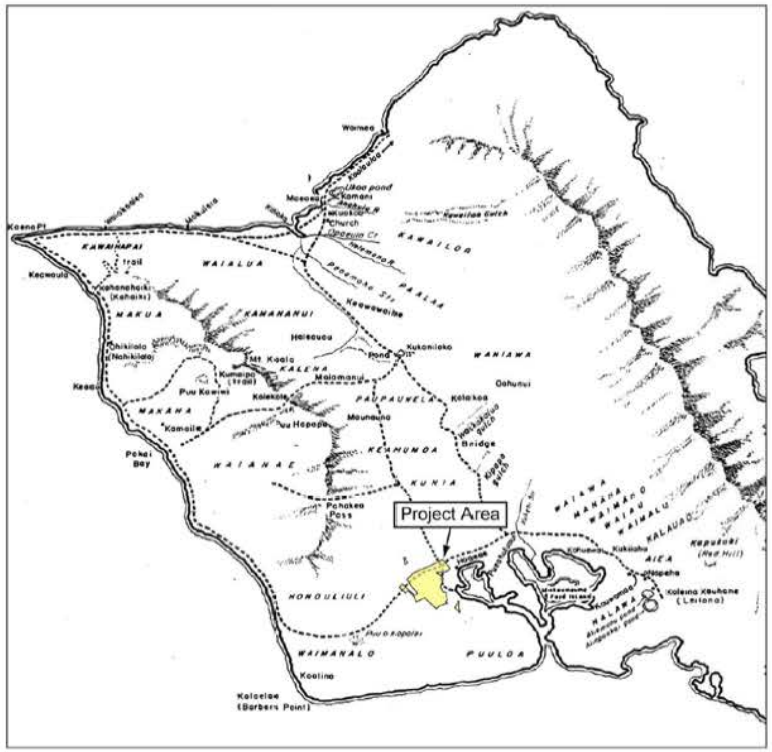

Figure 6. Trails of Leeward Oahu. Map by Paul Rockwood. ('Ī'ī 1959:96) Mid- to late-1800s

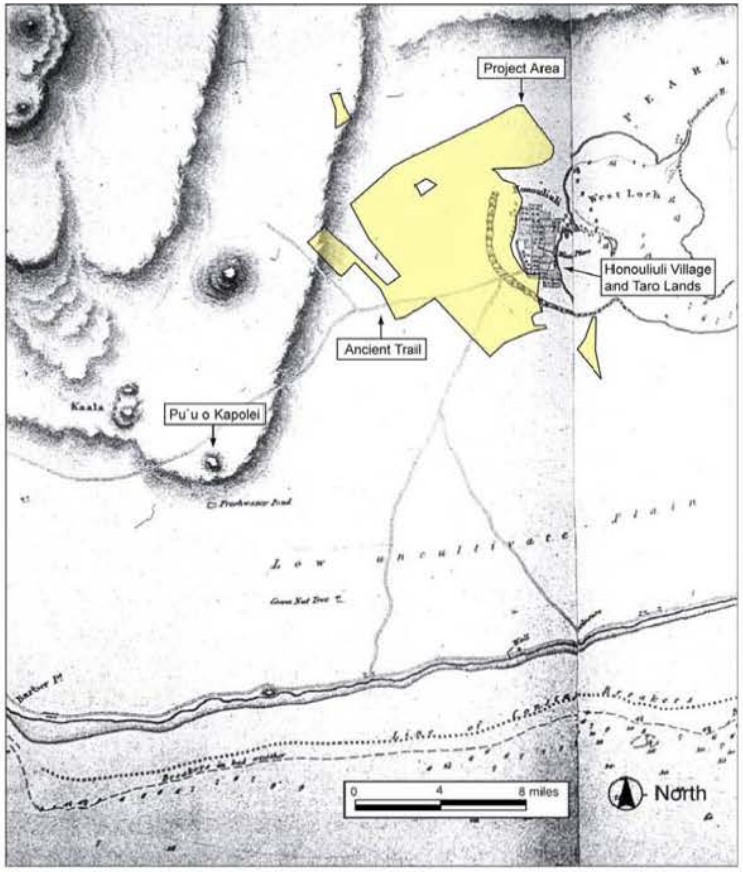

Figure 7. Portion of 1825 Map of the South Coast of Woahoo (O'ahu) and Honolulu by Lieut. C.R. Malden from the British ship the *Blonde* showing Honouliuli, the ancient trail, Pu'uokapolei, and the Project Area

4.1.1 Observations of Early Explorers and Foreign Residents

Captain Vancouver sailed by Kalaeloa (Barbers Point) in 1792, and recorded his impression of the small coastal village of Kualaka'i and the arid Honouliuli coast.

> The point is low flat land, with a reef round it. . . Not far from the S.W. point is a small grove of shabby cocoa-nut trees, and along these shores are a few struggling fishermen's huts [Vancouver 1798, Vol. I:167].

> . . .from the commencement of the high land to the westward of Opooroah [Pu'uloa], was composed of one very barren rocky waste, nearly destitute of verdure, cultivation or inhabitants, with little variation all the way to the west point of the island . . .[Vancouver 1798, Vol. II:217].

> . . .This tract of land was of some extent but did not seem to be populous, nor to possess any great degree of fertility; although we were told that at a little distance from the sea, the soil is rich, and all necessaries of life are abundantly produced . . . [Vancouver 1798, Vol. III:361-363].

Archibald Campbell, an English seamen who was given some land in Waimano Ahupua'a by King Kamehameha in 1809, described his land around Pearl Harbor:

> In the month of November the king was pleased to grant me about sixty acres of land, situated upon the Wymummee [traditional Hawaiian name for Pearl River], or Pearl-water, an inlet of the sea about twelve miles to the west of Hanaroora [Honolulu]. . . .We passed by footpaths, winding through an extensive and fertile plain, the whole of which is in the highest state of cultivation. Every stream was carefully embanked, to supply water for the taro beds. Where there was not water, the land was under crops of yams and sweet potatoes [Campbell 1967:103-104].

> Pearl and mother of-pearl shells are found here in considerable quantity. Since the king has learned of their value, he has kept the fishing to himself, and employs divers for the purpose [Campbell 1967:114-115].

Subsequent to western contact in the area, the landscape of the 'Ewa plains and Wai'anae slopes was adversely affected by the removal of the sandalwood forest, and the introduction of domesticated animals and new vegetation species. Domesticated animals, including goats, sheep and cattle, were brought to the Hawaiian Islands by Vancouver in the early 1790s, and allowed to graze freely about the land for some time after. It is unclear when the domesticated animals were brought to O'ahu; however, L.A. Henke reports the existence of a longhorn cattle ranch in Wai'anae by at least 1840 (Frierson 1972:10). During this same time, perhaps as early as 1790, exotic vegetation species were introduced to the area. These typically included vegetation best suited to a terrain disturbed by the logging of sandalwood forest and eroded by animal grazing. Within the current Project Area, the majority of the vegetation is comprised of introduced species, mainly grasses.

At contact, the most populous *ahupua'a* on the island was Honouliuli, with the majority of the population centered on Pearl Harbor. In 1832, a missionary census of Honouliuli recorded the

population as 1,026. Within four years the population was down to 870 (Schmitt 1973:19, 22). In 1835, there were eight to ten deaths for every birth (Kelly 1991:157-158). Between 1848 and 1853, there was a series of epidemics of measles, influenza, and whooping cough that often wiped out whole villages. In 1853, the population of 'Ewa and Wai'anae combined was 2,451 people. In 1872, it was 1,671 (Schmitt 1968:71). The inland area of 'Ewa was probably abandoned by the mid-nineteenth, due to population decline and consolidation of the remaining people in the town of Honouliuli (at Papapuhi Point, east of the Project Area). A detailed discussion of the historic population counts in the 'Ewa District has been presented by Charvet-Pond and Davis (1992).

The first mission station in 'Ewa was established in 1834 at Kalua'aha near Pearl Harbor. Charles Wilkes, of the U.S. Exploring Expedition visited the missionary enclave at Honouliuli town in 1840.

> At Ewa, Mr Bishop has a large congregation. The village comprises about fifty houses, and the country around is dotted with them. . . . The natives have made some advance in the arts of civilized life; there is a sugar-mill which, in the season, makes two hundred pounds of sugar a day. . . . In 1840, the church contained nine hundred members, seven hundred and sixty of whom belonged to Ewa, the remainder to Waianae; but the Catholics have now established themselves at both these places, and it is understood are drawing off many from their attendance on Mr. Bishop's church [Wilkes 1970:80-81].

The earliest detailed map of the area (Alexander 1873 Figure 8) shows no habitation closer than the western edge of West Loch in the vicinity of Pāpapuhi Point. A Monsarrat survey map of 1878 documents substantial settlement at the "Honouliuli Taro Land" in the Pāpapuhi Point area, and it seems clear that in early historic times, this was the focus of the population of Honouliuli. The amenities of the area - including fishponds, taro *lo'i*, abundant shellfish, and salt pans - would have focused population there in pre-Contact times as well.

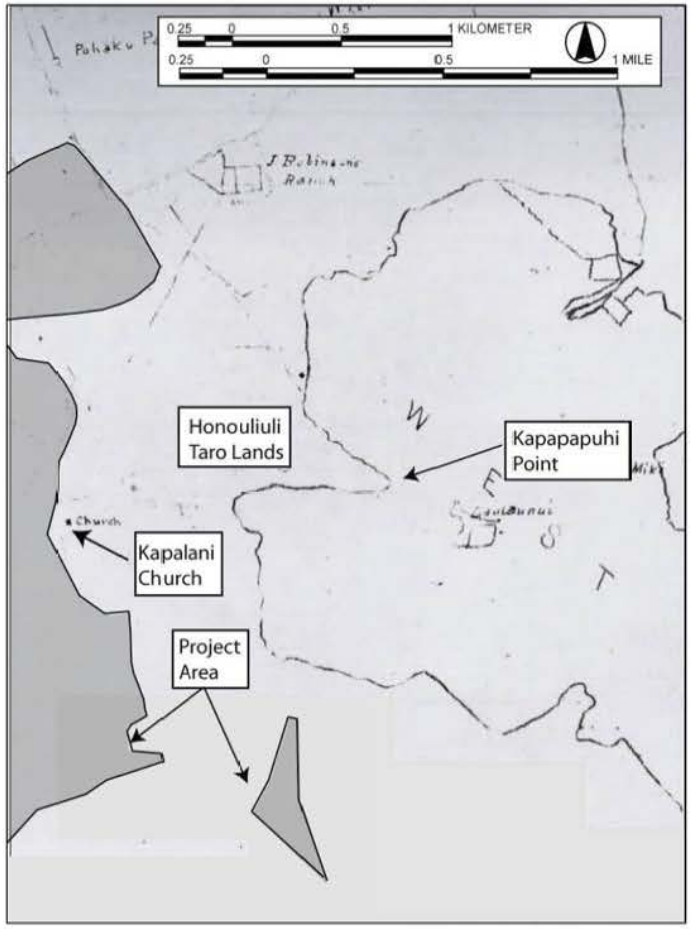

Figure 8. Portion of 1873 W.D. Alexander map of Honouliuli, showing location of Papapuhi Point (habitation symbols are illegible); also note location of Kapalani Catholic Church

4.2 Mid-Nineteenth Century and the Māhele

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* (chiefly class) received their land titles. The common people received their *kuleana* (individual parcels) in 1850.

During the *Māhele* of 1848, 72 individual land claims in the *ahupua'a* of Honouliuli were registered and awarded by King Kamehameha III (Tuggle and Tomonari-Tuggle 1997:34). The 72 *kuleana* awards were almost all made adjacent to Honouliuli Gulch, which contained fishponds and irrigated taro fields. Kepa Maly (1997: 38-42) provides a table recording information on each award, including awardee, *'ili*, and land use of the *'āpana* (lot). A summary of the information on houses, fields, and boundary landmarks noted for each *'ili* is given below in Table 1 and *'ili* locations are shown on Figure 9.

4.2.1 Project Area Māhele Awards

A comparison of Project Area maps with an 1878 map surveyed by M.D. Monsarrat (Figure 10) clearly show that all or portions of certain land claims belonging to Kelia (LCA 763), Pue (LCA 869), Leleiupa (LCA 1699) and Kua (LCA 5653) lie within the Project Area. These LCAs were once located on the east side of the main road along Honouliuli town, but now portions lay west of the current alignment of Old Fort Weaver Road. A brief review of the four known LCAs within the Project Area follows (see Figure 10):

Kelia'a *'Āpana ('Āp.)* 1 (LCA 763)

Kelia's claimed this land situated in the *'ili* of Poohilo and Uani for his houses. His witnesses agreed with his claim, but there was a dispute over whether there were 3 or 4 houses within the parcel. All agreed Kelia has one house there and that his father, Pueeu had two. The west or Wai'anae boundary was described variously as the "*pali* of Makaaku," "a ravine" or "a cliff." The claimant received his house lot from his father Pueeu and "has accepted it ever since 1836."

Pue *'Āpana* 1 and *'Āpana* 2 (LCA 869)

Pue claimed four parcels in the *'ili* of Maui at Honouliuli, 'Ewa. One parcel was a houselot and had two houses on it, one for himself and one for Puali who was his father-in-law. The western side was bounded by the land of Koi, the *luna* (overseer), who gave Pue's family their land in 1842. The other parcel within the Project Area was *kula*, pasture land to the east of the houselot.

Leleiupa *'Āpana* 1 and *'Āpana* 2 (LCA 1699)

Leleiupa 'Āpana 1 and 2 were claims for two parcels situated in the *'ili* of Maui. 'Āpana 1 was bordered on the west by the land of Koi.

Kua (LCA 5623)

Kua claimed two taro patches and a *kula* land called Kahui in the *'ili* of Maui. Of note was the sworn testimony of Maakuia on the Land Court Application for Mahina (LCA 749), which stated that the western boundary of Mahina's land was [Kaulaula] Pali, which had a wall on its top.

Table 1. Summary of land use and boundary landmarks recorded in Honouliuli LCA awards

'Ili	Land Use and Boundary Landmarks
Hiwalalo	kou trees
Ka'aumakua	houselots, *kalo* (taro) patches; *kula* (pasture/dryland agriculture), two fishponds called Mokumeha; landmarks - *kula ālialia* (salt plains), land division wall, Pānāhāhā *loko* (fishpond), Kalahu fishpond, Naholowaa pond, Honouliuli Stream (called stream of Makai'i), or *'aka'akai* (bulrush growth) of Kamo'okahi
Kaihuopala'ai	*mo'i* (arable land in a long strip); on lot bounded by *'auwai* (irrigation ditch) called Panaenui
Ka'ilikahi	houselot and *kalo* patches; landmarks – highway, Kauhipuna cliff, *lapalapa* (*panax*) thickets,meeting house
Kamilomilo	houselot and *kalo* patches
Kamoku	fenced *mo'o kalo*, *lo'i* (irrigated fields) *kalo*, houselot; landmarks – Kauhipuna pali
Kamo'okahi	bulrushes
Kapāpahi	houselots, *kalo* patches; bounded by ponds of Healani
Kapapapūhi	houselots, vineyard, *kula*, pond, trails, hog pens, and salt beds; a church and cemetery are shown on Figure 10 but not mentioned in testimony; therefore it was probably built in the post-Māhele period
Ka'ula'ula	*mo'o* next to Kaulaula (cliff) with a houselot and a wall
Loloulu	*kalo* patches, 1/3 of a fishpond (in land of Kahakuli'ili'i), hala grove, pig pens, breadfruit, bulrushes
Maka'u	houselot and *kalo* patches
Maui	kalo patches, *kula*, houselots, bounded by *pā'āina a ke Aupini* (land division wall of the government)
Mokumeha	2 fishponds, salt beds (western one called Kohumakahou)
Niuke'e	*kalo* patches, *kula*, potato field, houselots; landmarks - *loko kalo* (taro/ fishpond) of Nihola, Loko'eli pond, Kehewanakawalu pond, Kalokoiki pond, *pali* of Kihewamakawela; Ka'akau pali; Ka'akau community, meeting house, prison plot, cattle fences
Polapola	*kalo* patches; houselots, school house, prison plot; some bounded by *pā'āina a ke Aupini,* or high road from the sea, or Catholic Chapel yard
Pō'ohilo	*kula*, *kalo* patches, *loko kalo*, houselots; landmarks - *pā'āina,* Ka'aimanō fishpond, *kula* of Kahakai, *loko kalo* of Kalokoloa, Aimea Pond, Waianu pond, Kahui pond, Ka'aimano fishpond, *pupulu* cave (wet cave?), prison plot, Makaakua pali, Puehuehu Stream, Puehuehu road
Pua'alu'u	*lo'i*, houselot
Pu'uloa	houselots; boundaries include the sea, a *kula* called Waioipu, and the plain of Kaluanohu

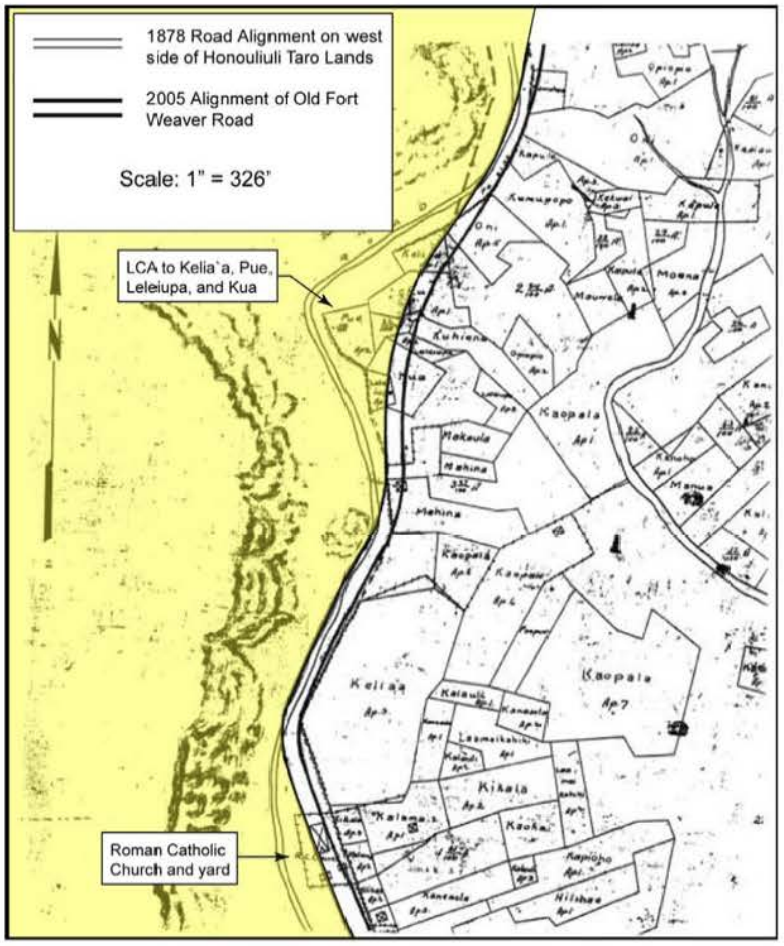

Figure 9. Portion of 1878 Monsarrat map, showing portion of Honouliuli Taro Lands in Relation to current alignment of Old Fort Weaver Road (eastern boundary of the Project Area)

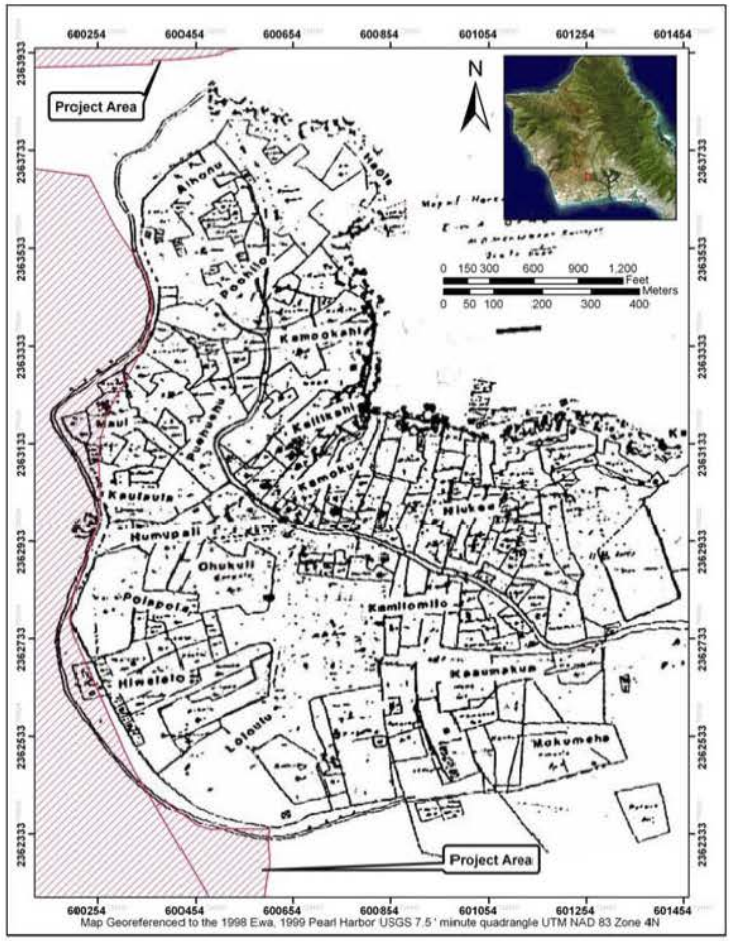

Figure 10. 1878 Map of Honouliuli Taro Lands (LCAs) by M.D. Monsarrat, with inserted '*ili* names

4.2.2 The Catholic Church

A portion of the former site of a Catholic church, called Kapalani Catholic Church, also now lies on the west side of the current road alignment, although the church itself was probably covered by the new road itself. This church and associated school house is believed to have been the site of the ministry of a particularly notable person, Kepelino Keauokalani.

There are two land applications that make reference to a Catholic Church near the town of Honouliuli. Kaohai in April of 1850 (LCA 5670B) claimed a house site in the '*ili* of Polapola "adjoining the Catholic Chapel yard." Hilinae (LCA 1720) in November of 1847 made a houselot claim in the '*ili* of Polapola bounded on the west by the Kapalani Church. Little is known about the Kapalani Roman Catholic Church. It is clearly annotated on Monsarrat's 1878 map (see) and is the lone "church" pictured on an 1873 and 1881 map of the Honouliuli district by Alexander (Figure 11). Even the name is uncertain, as Kapalani probably means "the Frenchmen's" church. Efforts to found a Catholic Mission in Hawai'i were initially met with hostility until the issuing of an edict of toleration in 1839. The establishment of the Catholic Mission in Hawai'i in May of 1849 initiated an active period of building churches and schools. The Kapalani church (and school house) cited in the Land Court Application of Hilinae in November of 1847 must have been constructed within the previous seven years. Father Raymond Delande was pastor of the Leeward District of the church from 1857-1885 and, operating out of Honouliuli, he covered an area extending as far as Makaha and Waialua. "Up to 1877, he had baptized 600 children and adults, all living along the SW coast of Oahu" (Schoofs 1978:110).

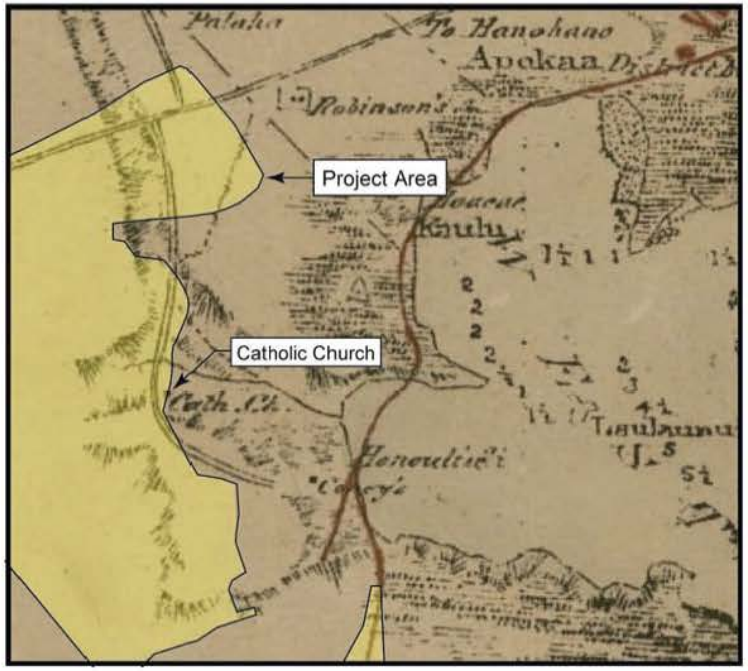

Figure 11. Portion of 1881 Hawai'i Government Survey Map (Alexander) showing location of the Catholic Church

Of particular interest is the association with this church of Kahoali'ikumaieiwakamoku Kepelino (Zepherino) Keauokalani, whose name means "to-be-the-chief-of-the-nine-districts" (Beckwith 1978:4). His father was Namiki, of the lineage of the high priest Pa'ao and his mother, Kahiwa Kaneikopulei, was a daughter of Kamehameha I. They had two children, the son Kepelino, and a daughter named Puahau. Namiki was the "old savage" whose narratives were collected by Jules Remy as "Contributions of a Venerable Savage to the Ancient History of the Hawaiian Islands" during his travels in the islands between 1851 and 1855. In a note on a section concerning the priest Pā'ao, the author talks about Namiki's son, who he met in 1853.

> The old historian Namiki, an intelligent man, and well versed in the secrets of Hawaiian antiquity, has left precious unedited documents, which have fallen into our hands. His son, Kuikauai, a school-master at Kailua, one of the true historico-sacerdotal race, has given us a genealogy of his ancestors which ascends without break to Paao [Remy 1857, in Nordhoff 1974:253].

The family was of Kailua, Kona, Hawai'i and converted to Catholicism very quickly after the arrival of Fathers Walsh and Ernest Herutel of the Catholic Mission to Kona in 1840. His parents sent him to Catholic school in Honolulu in 1845 to become a teacher. Father Ernest writes:

> Father Martial writes me about our little Zepherin, telling me that he has been received as teacher but that because they have no school to give him as yet, he has not received his diploma. Father Desire wants to keep him to send to the High School; but when will you have a High School? Perhaps not so soon. I think therefore that Zepherin would be more usful here as we lack teachers [cited in Beckwith 1978:4].

As noted above, Remy claims that at some point, Kepelino was a school teacher in Kailua; although Remy is believed to have met Kepelino in 1853, his teaching position at Kailua could have dated to an earlier period, possibly around 1845, when Father Ernst suggested that he return to the island of Hawai'i from Honolulu. At some point he attended the Catholic High School at Ahuimanu (established in 1846), where he is said "to have acquired English, French, Latin, and Greek" (Beckwith 1978:5). In 1847, at the age of 17, he was sent briefly with Father Ernest to Tahiti to help establish a Catholic mission. He developed a reputation for his pranks and was sent back to his partents (Beckwith 1978:5).

Controversial letters under the name of Z. Kahoali'i, addressed from the town of Honouliuli on O'ahu, were published in Catholic newspapers from 1860-1869. A letter in the Public Instruction Correspondence filed and dated 11/26/1851, written by a school teacher name Naheona to the Minister of Public Education, state his reasons for the rejection of a teacher "Kepilina" and accuses Kepilina of "dancing and thieving while employed as teacher of Honouliuli School and of general improper conduct." The letter also mentions "Catholic priests in the area who have been among the people for a while who do not recommend retaining Kepilina" (In Silva 1987:A8). It seems quite probable that Kepelino lived at Honouliuli from 1851 into the 1870s and that as a devout Catholic and teacher that he taught at the school house next to Kapalani Church.

Detailed biographic information on Kepelino is not readily available, which is probably due in part to the fact that he was "controversial" for the Catholics and for the government. He went on

to become Queen Emma's secretary (by at least 1874) and was one of the most important documenters about Hawaiian beliefs and traditions. He supported Queen Emma as the heir of King Lunalilo over David Kalākaua, and wrote letters to the king of Italy and the queen of England, asking for warships to support Queen Emma's cause. In 1874, the newly elected King Kālakaua had him tried for high treason and sentenced him to hanging, but the sentence was commuted and he was released from prison in 1876; he died in 1878 (Day 1984:77).

"The Honouliuli church . . . had by the 1880s outlived its usefulness and become dilapidated. It was therefore abandoned and replaced by a simple structure close, too close to the mill" [at 'Ewa Village, south of the Project Area] (Schoofs 1978:111). However, "in 1891 Honouliuli was still important enough to acquire its own Catholic cemetery" (Schoofs 1978:110). Whether this cemetery or any other Catholic cemetery was on the grounds of the Kapalani Church in unknown. In the late 1920s, Bishop Alencastre exchanged land at Honouliuli with Campbell Estate for land at 'Ewa Village to establish a new church.

4.2.3 Honouliuli Māhele Awards to *Ali'i*

In 1855 the Land Commission awarded all of the unclaimed lands in Honouliuli, 43,250 acres, to Miriam Ke'ahikuni Kekau'ōnohi (Royal Patent #6971 in 1877; Parcel #1069 in the Land Court office), a granddaughter of Kamehameha I, and the heir of Kalanimōkū, who had been given the land by Kamehameha after the conquest of O'ahu (Indices of Awards 1929; Kame'eleihiwa 1992). Kekau'ōnohi was also awarded the *ahupua'a* of Pu'uloa, but she sold this land in 1849 to Isaac Montgomery, a British lawyer.

Kekau'ōnohi was one of Liholiho's (Kamehameha II's) wives, and after his death, she lived with her half-brother, Luanu'u Kahalai'a, who was governor of Kaua'i (Hammatt and Shideler 1990:19-20:20). Subsequently, Kekau'ōnohi ran away with Queen Ka'ahumanu's stepson, Keli'iahonui, and then became the wife of Chief Levi Ha'alelea. Upon her death on June 2, 1851, all her property was passed on to her husband and his heirs. A lawsuit (Civil Court Case No. 348) was brought by Ha'alelea in 1858, to reclaim the fishing rights of the Pu'uloa fisheries from Isaac Montgomery, and the court ruled in Ha'alaea's favor. In 1863, the owners of the *kuleana* lands deeded their lands back to Ha'alelea to pay off debts owed to him (Frierson 1972:12). In 1864, Ha'alelea died, and his second wife, Anadelia Amoe, transferred ownership of the land to her sister's husband John Coney (Yoklavich et al 1995:16).

4.2.4 Early Ranching on the 'Ewa Plain

John Coney rented the land to James Dowsett and John Meek in 1871, who used the land for cattle grazing. In 1877, the land, except for the *'ili* of Pu'uloa, was sold to James Campbell for $95,000. He drove off 32,237 head of stock belonging to Dowsett and Meek and to James Robinson and constructed a fence around the outer boundary of his property (Bordner and Silva 1983:C-12) (Figure 12). He let the land rest for one year and then began to restock the ranch, so that he had a head of 5,500 head after a few years (Dillingham 1885, cited in Frierson 1972:14). A 1880s photograph of James Campbell's residence in Honouliuli shows the open, sparsely vegetated plain of 'Ewa, likely an effect of the years of cattle grazing across the plain.

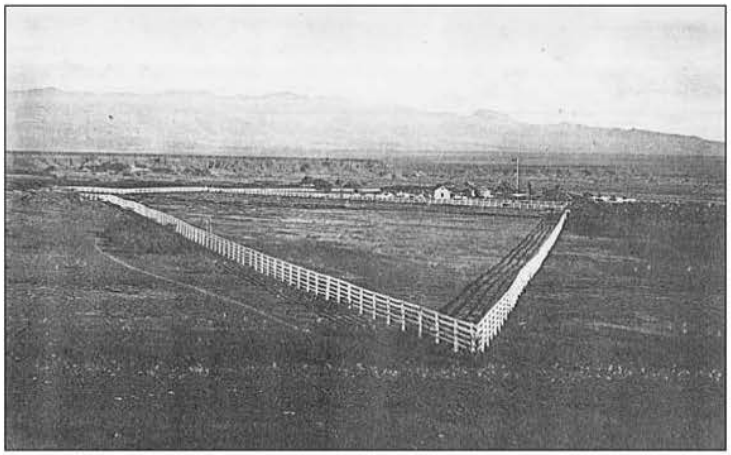

Figure 12. 1880s photograph of James Campbell's residence on the 'Ewa Plain (Bishop Museum Archives)

In 1880-81, the Honouliuli ranch was described as:

> . . . Acreage, 43,250, all in pasture, but possessing fertile soils suitable for agriculture; affords grazing for such valuable stock. The length of this estate is no less than 18 miles. It extends to within less than a mile of the sea coast, to the westward of the Pearl River inlet. . . . There are valuable fisheries attached to this estate . . . . [Bowser 1880:489].
>
> From Mr. Campbell's veranda, looking eastward, you have one of the most splendid sights imaginable. Below the house there are two lochs, or lagoons, covered with water fowl, and celebrated for their plentiful supply of fish, chiefly mullet. . . . Besides Mr. Campbell's residence, which is pleasantly situated and surrounded with ornamental and shade trees, there are at Honouliuli two churches and a school house, with a little village of native huts [Bowser 1880:495].

Most of Campbell's lands in Honouliuli were used exclusively for cattle ranching. At that time, one planter remarked "the country was so dry and full of bottomless cracks and fissures that water would all be lost and irrigation impracticable" (Ewa Plantation Co. 1923:6-7). In 1879, Campbell brought in a well-driller from California to search the 'Ewa plains for water, and the well, drilled to a depth of 240 feet near Campbell's home in 'Ewa, resulted in ". . . a sheet of pure water flowing like a dome of glass from all sides of the well casing" (The Legacy of James Campbell n.d., cited in Pagliaro 1987:3). Following this discovery, plantation developers and ranchers drilled numerous wells in search of the valuable resource. A Hawai'i Visitor Bureau,

marker, located in the southwestern portion of the Project Area, bears the inscription "Site of First Artesian Well in the Hawaiian Islands drilled by James Ashley for James Campbell owner of Honouliuli Ranch brought in on Sept. 22, 1879." Kuykendall (1967:III, 67) states that this well was "near Campbell's ranch house" but Campbell's ranch house, which is shown on Monsarrat's 1878 map, was located outside the Project Area.

4.3 History of the Ewa Sugar Plantation

4.3.1 General History of the Plantation

In 1886, Campbell and B. F. Dillingham put together the "Great Land Colonization Scheme," which was an attempt to sell Honouliuli land to homesteaders (Thrum 1886:74). This homestead idea failed, but with the water problem solved by the drilling of artesian wells, Dillingham decided that the area could be used instead for large-scale cultivation (Pagliaro 1987:4). During the last decade of the nineteenth century, the railroad would reach from Honolulu to Pearl City in 1890, to Wai'anae in 1895, to Waialua Plantation in 1898, and to Kahuku in 1899 (Kuykendall 1967:100). This railroad line eventually ran across the center of the 'Ewa Plain at the lower boundary of the sugar fields.

To attract business to his new railroad system, Dillingham subleased all land below 200 ft to William Castle, who in turn sublet the area to the newly-formed Ewa Plantation Company (Frierson 1972:15). Dillingham's Honouliuli lands above 200 ft that were suitable for sugar cane cultivation were sublet to the Oahu Sugar Company (Figure 13). Throughout this time, and continuing into modern times, cattle ranching continued in the area, and Honouliuli Ranch - established by Dillingham was - the "fattening" area for the other ranches (Frierson 1972:15).

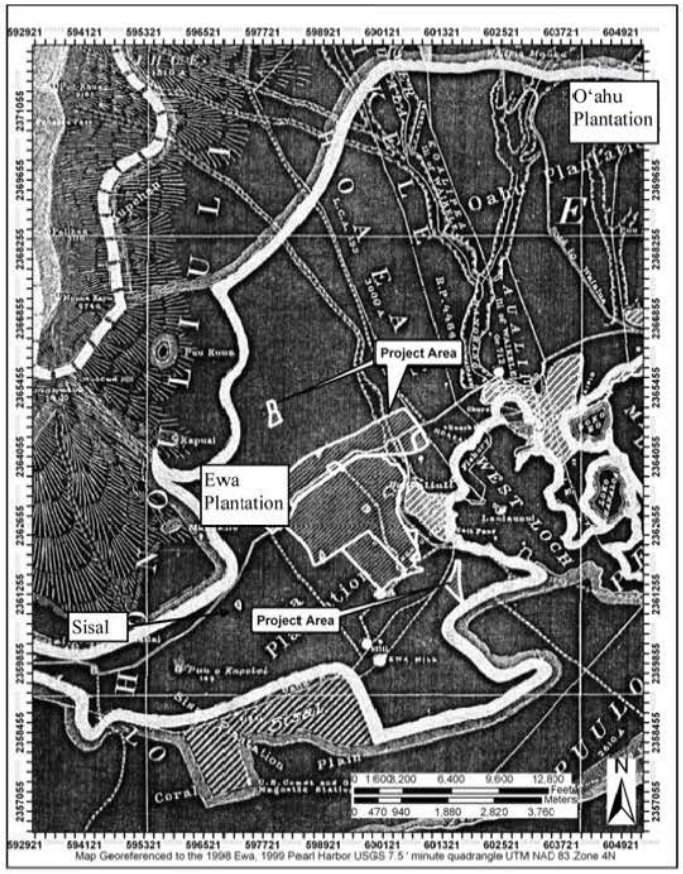

Figure 13. 1902 map showing relationship of Ewa Plantation and the Oahu Sugar Co. plantation; also note location of sisal growing area

4.3.2 History of the Ewa Sugar Plantation

Ewa Plantation Company (Figure 14) was incorporated in 1890 for sugar cane cultivation. The first crop, 2,849 tons of sugar, was harvested in 1892 at the Ewa Plantation. 'Ewa was the first all-artesian plantation, and it gave an impressive demonstration of the part artesian wells were to play in the later history of the Hawaiian sugar industry (Kuykendall 1967:69). As a means to generate soil deposition on the coral plain and increase arable land in the lowlands, the Ewa Plantation Company installed ditches running from the lower slopes of the mountain range to the lowlands. When the rainy season began, they plowed ground perpendicular to the slope so that soil would be carried down the drainage ditches into the lower coral plain. After a few years, about 373 acres of coral wasteland were reclaimed in this manner (Immisch 1964). By the 1920s, Ewa Plantation was generating large profits and was the "richest sugar plantation in the world" (*Paradise of the Pacific,* Dec. 1902:19-22, cited in Kelly 1985:171).

Just north of 'Ewa Plantation was the equally sprawling O'ahu Sugar Company which "covered some 20 square miles . . . ranging in elevation from 10 feet at the Waipio Peninsula . . . to 700 feet at the Waiahole Ditch" (Condé and Best 1973:313). The Oahu Sugar Company was incorporated in 1897. Prior to commercial sugar cultivation, the lands occupied by the Oahu Sugar Company were described as being "of near desert proportion until water was supplied from drilled artesian wells and the Waiahole Water project" (Condé and Best 1973:313). The Oahu Sugar Company took control of the Ewa Plantation lands in 1970 and continued operations until 1995, when they decided to shut down sugar cane production in the combined plantation area (Dorrance and Morgan 2000:45, 50).

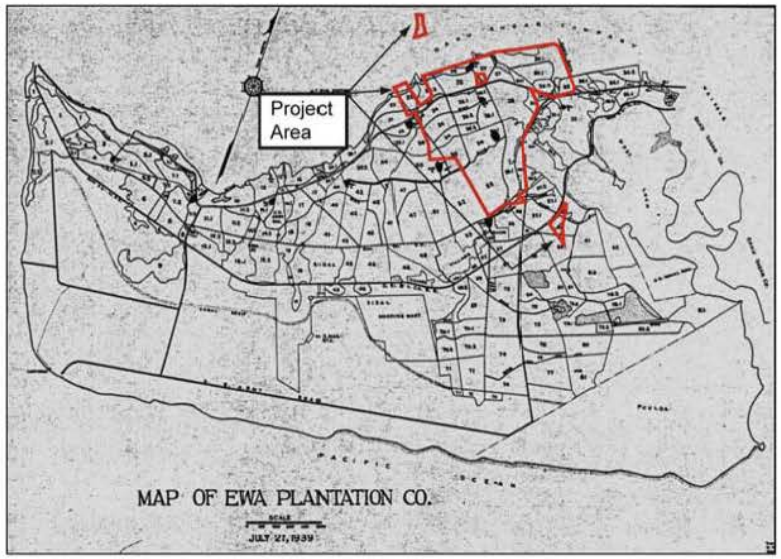

Figure 14. 1939 map of the Ewa Plantation Co. lands, showing Project Area and alignment of railroad.

During the subsequent decades of the twentieth century, sugar cane operations in 'Ewa phased out and, more recently, former cane lands have been rezoned for residential development. Structures in the area of the former plantation villages have fallen into disrepair or have been demolished. However, portions of the area - including Varona Village, Tenney Village, and Renton Village - have been designated the 'Ewa Villages Historic District (State site 50-80-12-9786), which has been nominated for National Historic Landmark status. Additionally, the still-existing O.R.&L. rail line through Honouliuli has been placed on the National Register of Historic Places (Site 50-80-12-9714).

4.3.3 History of PipeLine Village

During the twentieth century, the Ewa Plantation would continue to grow and, by the 1930s, would encompass much of the eastern half of Honouliuli Ahupua'a. This growth compelled the creation of plantation villages to house the growing immigrant labor force working the fields. In the decade of the 1890s, the plantation built 72 houses, cottages or dwellings; in the first decade of this century, 536; in the second decade, 132; in the 1920s, 285; in the 1930s, 168; and, in the 1940s, only 35. Censuses of the Ewa Plantation population record 4,967 persons in 1928, 4,477 in 1929, and 4,100 in 1932. After the outbreak of World War II, which siphoned off much of the

plantation's manpower, along with the changeover to almost complete reliance on mechanical harvesting in 1938, there was little need for the large multi-racial (Japanese, Chinese, Okinawan, Korean, Portuguese, Spanish, Hawaiian, Filipino, European) labor force that had characterized most of the early history of the plantation.

It is also important to note that in the history of construction, buildings were moved, demolished, and replaced all the time. As early as 1899, the plantation moved "the lower camp of thirty houses [believed to be duplexes built in 1890] to a position on the bluffs nearby . . . principally for sanitary reasons" (Ewa Plantation Company Annual Report for 1890).

The original location of these thirty houses is unknown. They probably were not in the area later known as "Lower Camp" and may have been in the Honouliuli Taro lands. It is also unknown where they moved to "on the bluffs," but it seems probable that they were moved to what became the west central portion of PipeLine Village near the present water pumping station in that vicinity. A 1908/1913 U.S. Army Fire Control map shows 47 houses in the area of Pipeline Village (Figure 15)

PipeLine Village was a major plantation community that lay in the central southern portion of the present Project Area and is shown in detail in a 1928 USGS map (Figure 16), which documents the location of about 160 houses, a church and a school. This was probably the great extent of PipeLine Village. An entry in the 1931 Annual Report of Ewa Plantation Company records that "The PipeLine Village of 162 cottages built in 1906" was dismantled and that "other cottages near [near the factory, south of the Project Area] were erected using the reclaimed lumber from the PipeLine Villages". Photos (Bishop Museum Visual Collection) (Figure 17) dated 1906 show what appear to be brand new single family residences at PipeLine Village, but the Annual Report for 1906 documents the construction of only 47 houses and many of there were probably not built in PipeLine Village. Some photos dated 1907 (Figure 18) show houses at PipeLine village with very well established gardens and tall banana, papaya, and many mango trees, suggesting that they are significantly older. Another photo dated January 1910 (Figure 19) shows a line of ten new cottages with the caption "Pipe Line Village (Family houses built during 1909)." One hundred and twenty-nine cottages were built for married laborers in that year and they well include the majority of the houses at PipeLine Village.

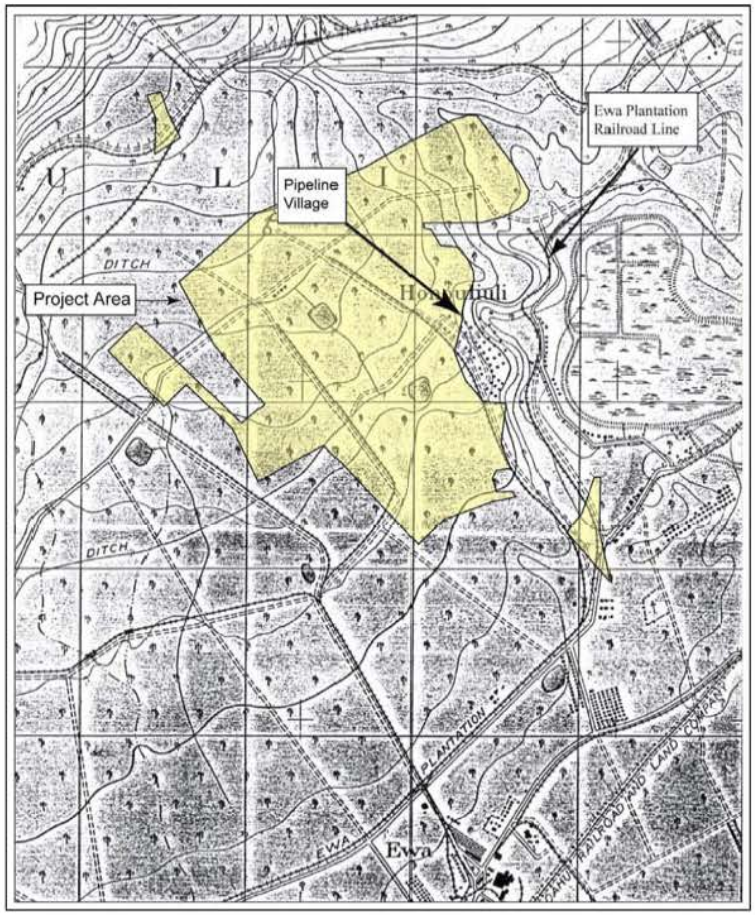

Figure 15. Portion of an 1908/1913 U.S. Army Fire Control map, showing 47 houses in Pipeline Village; map also shows the alignment for the Ewa Plantation railway

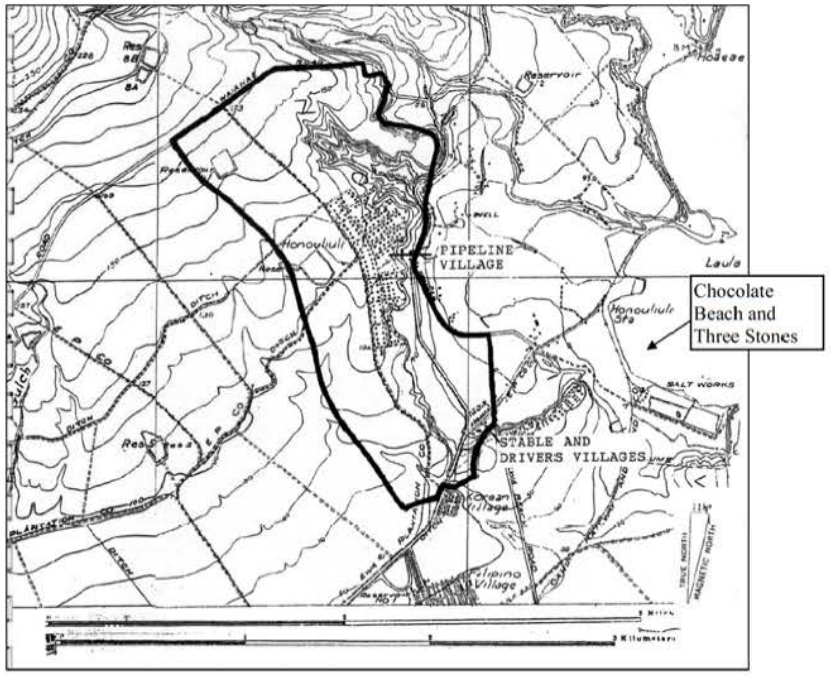

Figure 16. 1927/1928 US Geological Survey map, showing location of PipeLine Village, Stable Village, Drivers's Village, and other Ewa Plantation structures, Salt Works and location of Chocolate Beach and Three Stones.

In 1911 "60 new houses, principally for Spanish and Portuguese workmen with families" were erected. Thus, it seems highly probable that PipeLine village was largely constructed between 1906 and 1911, but may have incorporated a number of relocated structures dating to 1890. The demolition of 1931 was probably quite thorough, and not a trace of the structures was found on later maps.

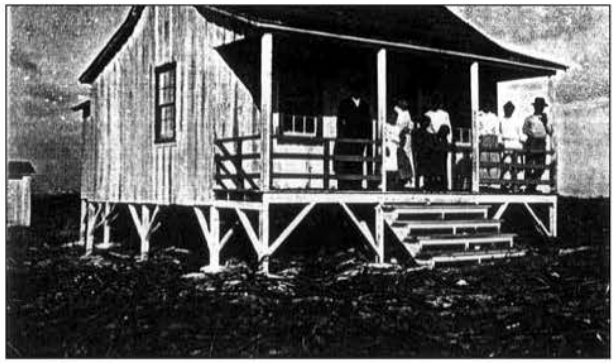

Figure 17. Portuguese family residence at PipeLine Village. 1906

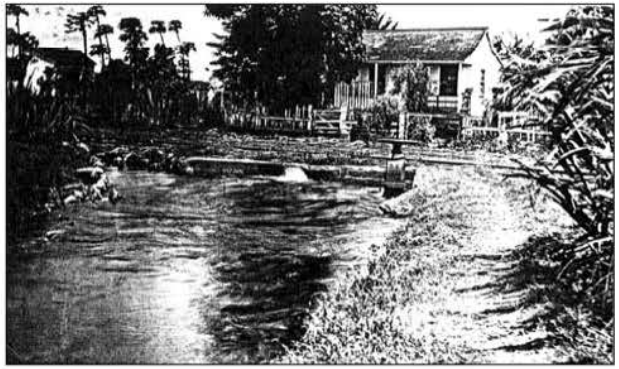

Figure 18 Discharge Pump No. 5, PipeLine Village 1907

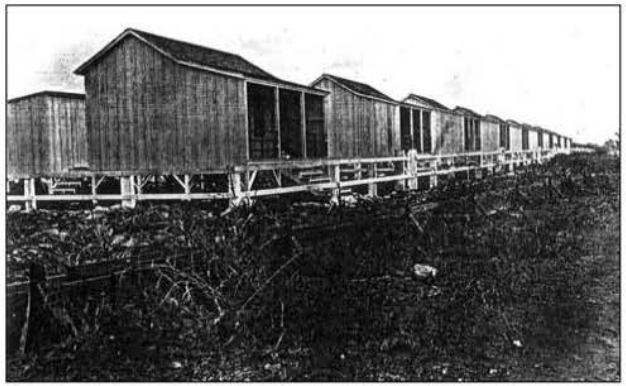

Figure 19. PipeLine Village, family houses built in 1909, photograph taken on January 1910

Figure 20. PipeLine Village, April 7, 1907; *forno* (Portuguese brick bread oven) at center of photograph

4.3.4 History of Stable Village and Drivers Village

The Ewa Plantation housing located in the southeastern corner of the Project Area, just north of the present Hale O Ulu School, is not well-documented. It appears that there were at least two small villages located here: "Stable Village" and "Drivers Village." The Ewa Plantation Company Annual Report for 1931 states that "The Drivers Village, located near the main stable was in such a bad location that it was decided to move all the fourteen cottages down to 'B" village near the factory." Drivers Village doubtlessly corresponds to the site of the 14 houses shown on the 1927/1928 map (see Figure 16), with Stable Village probably referring to the structures just to the south across the street. The date of construction of these villages is unknown. No houses are shown in this area on the 1908/1913 Fire Control map (see Figure 15). The villages were probably built in that flurry of construction in the first decade of this century. All of the structures of Stable Village and Drivers Village are shown on the War Department Map of 1943, but this map must be another example of a lack of military intelligence regarding the Pearl Harbor area; records indicate that the hosues were probably all demolished around 1931.

4.3.5 Other Enterprises in Honouliuli

One of the first enterprises in Honouliuli in the post-Contact period was the making of salt. Soon after Kekau'ōnohi sold the land of Pu'uloa to Isaac Montgomery in 1849, the king (Kamehameha III) and Montgomery entered into a partnership to run the salt works in Pu'uloa. Kamakau (1961:409) reported "The king and Isaac of Pu'uloa are getting rich by running the salt water into patches and trading salt with other islands." The salt was also sent to Russian settlements in the Pacific Northwest, where it was used to pack salmon (*Hawaiian Gazette,* January 29, 1897). An 1853 newspaper article (*Polynesian,* August 20, 1853) on the "Puuloa Salt Works" says that this was the only place "where large quantities of salt were manufactured. Kelly (1991:160) says that there was another salt works at Kualaka'i (Nimitz Beach), but does not give a reference for this claim.

There reference concerning salt works in 'Ewa by Carol Silva (1987:A-4):

> An extensive and antiquated system of salt works operated on the shore of the Honouliuli lobe of West Loch. Another salt works was situated further seaward at Puuloa. The Puuloa Salt Works had beginnings that were traceable to the 1820's and possibly even much earlier. By 1861, 100 acres had been devoted to the production of salt [*Pacific Commercial Advertiser* 4/18/1861:1].

A 1927/1928 US Geological Survey map (see Figure 16) shows several rectangles labeled "Salt Works" on the right side of the map.

The Chinese were involved in salt production around Pearl Harbor, usually in concert with their management of fishponds. One son of one Chinese resident of the area, Mau Yung Kui, the groundkeeper of the John 'I'ī estate on Waipi'o, remembered [for ca. 1900] the Chinese form of salt production for salt pans bordering the sea, which were continually fed seawater by the tides.

Figure 21. 1881 photo of salt pans near Kaunakakai, Moloka'i (Dorothe B. Curtis collection)

> Both the natural tides and the Chinese method of peddling a wooden wheel that transported water upward, helped to keep the salt beds damp with about three inches of water. After a few months, the senior Mau would drain off the remaining water and use a wooden rake with deep prongs to break up the salt. When the bed was dry a flat rake was used to flatten and smooth out the salt. Later it was raked into piles, packed in cloth bags and distributed. . . . Past the rice fields of Ho'ae'ae and the beginning of Honouliuli were a number of productive salt flats adjacent to the ancient fishponds operated by Chinese at the turn of the century [Chong 1988:108].

As noted above, part of Mr. Campbell's lands were also used to grow rice. By 1885, 200 acres in Honouliuli were used for rice and 50 acres were used to grow bananas (article in *Pacific Commercial Advertiser*, August 15, 1885, summarized in Silva 1987:A-12). These rice fields were planted in former taro fields or in undeveloped swamps, such as those in the Project Area in the former Honouliuli Taro lands. The rice fields in 1882 were described by Frank Damon, during a tour of the area.

> . . . Towards evening we reached Honouliuli, where the whole valley is leased to rice planters . . . This was one of the largest rice plantations we visited. Sometimes two or three men only, have a few fields which they cultivate for themselves, and we often too came upon houses where there were eight or ten men working their own land. But the larger plantations are owned by merchants in Honolulu, who have a manager acting for them. . . . [Damon 1882:37].

In 1890, Dillingham leased all land below 200 ft to William Castle, who used most of the land for sugar cane, but also leased some lands for rice cultivation, pasture, wood lots, bee-keeping, garden crops, and quarries. Some land above 650 ft was also leased for the cultivation of "canaigre", which may be a word used for pineapple (Frierson 1972:15-16).

An additional agricultural trial was conducted in the Honouliuli area for the cultivation of sisal, a plant used to make fibers for rope and other material. Some sisal was planted before 1898

and production continued until the 1920s (Frierson 1972:16). This was grown mainly on the coastal plain of Honouliuli in Kānehili, just *mauka* of Kualaka'i Beach (now Nimitz Beach). An article in the *Paradise of the Pacific* in 1902 described this venture in glowing terms.

> . . . The venture was made and a tract of land containing a large percentage of disintegrated coral, in the neighborhood of Ewa Plantation, where nothing else would grow, was chosen for the planting. . . . The Hawaiian Fiber Co., which Mr. Turner organized, and of which he is now manager, has 755 acres under fence, two and a half miles of which is stone wall with good gates at convenient places. . . . In a large field containing 130 acres, mauka of the Oahu Railway & Land Co. track, the first harvest is to be gathered in a few months. . . . Out of this section of 130 acres the company has figured on securing 50 tons of clean fiber, for which it is offered eight cents per pound in Honolulu or nine cents per pound in San Francisco . . . . [*Paradise of the Pacific* March 1902:17].

Although many of the fishponds at Pearl Harbor deteriorated from lack of care and lack of people to maintain them in the early nineteenth century, there was some action to reclaim these areas in the later part of the century. Some were converted to rice fields, but others were maintained as fish ponds or duck ponds. Records of the Minister of Public Instruction (1848) show that some ponds were maintained by local teachers and students, with the funds generated used for the upkeep of the school system. Some ponds as early as 1848 were also maintained by prisoners, possibly from the women's prison located at Honouliuli. In 1852, however, Levi Ha'alelea reasserted his claims to these neglected lands, when he claimed all of the mullet from this area be reserved to him (Hawaii Kingdom files, cited in Silva 1987:A-7 to A-9). During James Campbell's tenure of the land, fish ponds and Pu'uloa fishing rights were leased out to various entrepreneurs (Kelly 1985:175).

Into the early twentieth century, some Hawaiian families continued to live in Honouliuli and preserve the traditional lifestyle, including at the fishing village of Kualaka'I (see Figure 5). One resident, Mrs. Eli Williamson, recalled:

> In the Honouliuli area the train stopped among the *kiawe* (algaraboa) trees and *malina* (sisal) thickets. We disembarked with the assorted food bundles and water containers. Some of the Kualaka'i '*ohana* (family) met us to help carry the '*ukana* (bundles) along a sandstone pathway through the *kiawe* and *malina*. The distance to the frame house near the shore seemed long. When we departed our '*ukana* contained fresh lobsters, *limu* (algae), fish and *i'a malo'o* (dried fish) . . . [Williamson in Kelly 1985:160].

4.3.6 The Military and Modern Developments

In 1891, Russian explorer Otto Von Kotzebue tried to observe Pearl River, but his group could not obtain a canoe. What he was told, however, led him to speculate on the possible importance of Pearl Harbor to the future.

> In the mouth of this river are several islands; it is so deep, that the greatest ship of the line can lie at anchor a few fathoms from the shore; and so broad, that a

> hundred vessels can conveniently find room in it. The entrance into the Pearl Rivers is in the same situation as the harbour of Hana-rura [Honolulu]; but the windings between the reefs are, however, said to render a passage more difficult. If this place were in the hands of the Europeans, they would certainly employ means to make this harbour the finest in the world [Von Kotzebue 1821:338-348].

The early missionary Levi Chamberlain was able to take an outrigger canoe trip to Pearl River, and noted the difficulty of access for larger ships.

> Kawaa took passage in our canoe to go down the harbor to a place where oysters are abundant to give orders to his people to gather a mess. The sail down the harbor was delightful . . . The passage down the creek for a number of miles was very pleasant till we got down near the reef and our course altered. We then could sail no longer as the wind was against us. The sail was lowered the mast taken down and secured across the outrigger and the rowers plied their paddles [Journal of Levi Chamberlain 1822-1849, Hawaiian Mission Schools, Storage Case 4, p. 899, from Sterling and Summers 1978:51].

The first foreign attempt to survey Pearl Harbor was made in 1840 during the U.S. Exploring Expedition, led by Charles Wilkes.

> In this district is a large inlet of the sea, into which the river Ewa empties; at the entrance of this inlet is the village of Laeloa (at Kalaeloa Pont): the shore is known by the name of Pearl River or harbour, from the circumstance that the pearl oyster is found here; and it is the only place in these islands where it occurs.
>
> The inlet has somewhat the appearance of a lagoon that has been partly filled up by alluvial deposits. At the request of the king, we made a survey of it: the depth of water at its mouth was found to be only fifteen feet; but after passing this coral bar, which is four hundred feet wide, the depth of water becomes ample for large ships, and the basin is sufficiently extensive to accommodate any number of vessels. If the water upon the bar should be deepened, which I doubt not can be effected, it would afford the best and most capacious harbour in the Pacific. . . . [Wilkes 1970:79].

Although Wilkes was impressed by the harbor, he was not at this time thinking of how this survey could benefit the American government in the future. In fact, Wilkes (1970:79) concluded, "As yet there is no necessity for such an operation, for the port of Honolulu is sufficient for all the present wants of the islands, and the trade that frequents them."

This had changed in less than 30 years, however. The U.S. military had tried to make a coaling station on Midway Island in 1869 by blasting through the coral reef to make a harbor; this plan failed. In 1873, General Schofield presented a confidential report to the U.S Secretary of War, recommending that Pearl Harbor should be available to the U.S. Navy. Schofield wrote:

> In case it should become the policy of the Government of the United States to obtain the possession of this harbor for naval purposes, jurisdiction over all the

> waters of Pearl River with the adjacent shores to the distance of 4 miles from any anchorage should be ceded to the United States by the Hawaiian Government. . . .
>
> The cession of Pearl River could probably be obtained by the United States in consideration of the repeal of the duty of Sandwich Island sugar. Indeed, the sugar –planters are so anxious for a reciprocity treaty, or so anxious rather for free trade in sugar with the United States, that many of them openly proclaim themselves in favor of annexation of these islands of the United States [Sen. Ex. Docs, 52nd Cong. 2nd Sess. No. 77, pp. 150-154, reproduced in Judd 1971:Appendix 3].

This reciprocity treaty was concluded in 1876 with the provision that Hawai'i would not "lease or relinquish sovereignty to another country or any harbor, etc." In 1887, the treaty was renewed and amended and allowed the United States the "exclusive right to enter the harbor of Pearl River, in the Island of Oahu, at to establish and to maintain there a coaling and repair station for the use of vessels of the United States" (Judd 1971:128).

After annexation of the islands to the United States in 1899, development began in order to make a Pacific base that could be used as a staging area for the Spanish-American war (Coletta 1985:433). Dredging of the harbor began in 1901, and additional dredging to deepen and widen the channel was conducted in 1908 and again in the 1920s. Money for the funding of the construction of dry docks and other support facilities was approved in 1908. In 1931 the Navy built an ammunition depot at West Loch on a 213-acre parcel that it had bought from the Campbell Estate. Construction of a new depot in Lualualei Valley and at West Loch Harbor began in 1931.

In the early 1930s, the U.S. Navy leased 700 acres of the Campbell Estate to build 'Ewa Field, a base with a mooring mast for Navy dirigibles. Although the mast was completed, the program was abandoned before the *Akron*, the designated airship for the mast, was built. In 1937, 18 miles of roads were built in the coastal Honouliuli area, and in 1939-1940 the U.S. bought 3,500 acres of land in this area (Landrum et al 1997:62-67), to build several other military camps and installations, including Barbers Point Naval Air Station, at the site of the old mooring mast.

On December 7, 1941 the Japanese Navy launched the devastating surprise attack on the United States base at Pearl Harbor and other military facilities. Although the major battle damage to the US Pacific Fleet was at its base at Ford Island in the Middle Loch of Pearl Harbor, Honouliuli did not escape unscathed.

> The Waipahu and Ewa sugar plantation, next to Pearl Harbor and the town of Wahiawa, adjoining Schofield Barracks, saw more action than did Honolulu.
>
> At Waipahu, machine gun bullets, shrapnel, and shells started two cane fires, riddled the sugar mill, hit the plantation hospital in four places, went through the roof of the company store, exploding in an electric supply warehouse, and narrowly missed many houses. In nearly all of the fields of tall cane, many of which contained terrified women and children, shells buried themselves-dozens of them in some concentrated areas-blasting holes in the ground the size of barrels, and flattening cane for several square yards.

> At Ewa, after bombing the nearby Marine airfield [at Barbers Point], enemy planes machine-gunned the plantation's main street, the mill and power plant and some 30 houses and started two cane fires [Allen 1999:20].

The attack had consequences not only for the military, but also for the civilians, mostly Japanese, who lived around West Loch.

> Two permanent local evacuations were ordered in the first month of the war, partly to remove civilians from areas which might be dangerous in event of further attack and partly to protect installations from possible sabotage or espionage activities. On a Thursday less than two weeks after the bombing, farmers adjacent to West Loch at Pearl Harbor were ordered to leave their farms by sundown. The order was modified to allow two days to prepare and the men were permitted to return to their farms during daylight until livestock could be moved and crops harvested. The displaced farmers, who had only recently been established at West Loch by the Farm Security Administration, were forced to seek temporary housing with friends and relatives at Ewa Plantation. Since they had invested in the enterprises practically all of their life's savings and considerable money borrowed from the FSA as well, several suffered heavy losses [Allen 1999:122].

Section 5 Previous Archaeological Research

5.1 Early Archaeological Surveys

All archaeological projects previously conducted in Honouliuli and Pu'uloa are listed below in Table 2. Two archaeological features, a boundary *pōhaku* or rock and a *hōlua*, or sledding site, are recorded only in the Boundary Commission Reports establishing the division lines between the *ahupua'a* of Honouliuli and Hō'ae'ae (to the east). The surveyor wrote of the southern point of this boundary:

> In regard to Hoaeae . . . the point of commencement is Pōhaku Palahalaha, a well known rock, now marked by an arrow and the name "Honouliuli" on one side and "Hoaeae" on the other, which I have made the initial point of the survey . . . [Boundary Commission Vol. 1:243].

This rock is shown on the Sterling and Summer map as Pōhaku Palaha (see Figure 5). In another boundary survey, the *pōhaku* is called a "large, flat rock" (Boundary Commission Vol. 1:249), which may indicate the origin of the name from the Hawaiian word *pālaha*, which means "flattened, wide" (Pukui and Elbert 1986:307). As the surveyor continued to walk the Honouliuli/Hō'ae'ae boundary, he marked the northern point of the division as:

> The Kamaaaina took me to the corner of Pauhala (?)-Hoaeae and Honouliuli – there is an ancient holua or sleding [*sic*] place near this – which is agreed for the ancient corner. . . [Boundary Commission Vol. 1:243].

The earliest attempt to record archaeological remains in Honouliuli Ahupua'a was made by Thrum (1906:46). He reported the existence of a *heiau* located on Pu'uokapolei , west of the present Project Area. In a second monograph on *heiau*, Thrum (1917) called this *heiau* Palole'i (Kapolei). Emory mapped and photographed these structures in 1933 (field notes), but they were dismantled and destroyed sometime before McAllister's survey of the islands in the 1930s. According to legend, Pu'uokapolei was the location on which Kamapua'a, the pig-god, resided with his grandmother, Kamaunuahihio (McAllister 1933:108).

In his surface survey of the 1930s, archaeologist J. Gilbert McAllister recorded the specific locations of important sites, and the general locations of less important sites (at least at Honouliuli). McAllister recorded 14 specific sites at Honouliuli, numbered Sites 133-146 (McAllister 1933:107-108) Site 146, which McAllister used to denote the entire 'Ewa coral plains, is the only one of these sites in the Project Area. This "site," which is more of a general area covering all the coastal flatlands of 'Ewa would include portions of the current Project Area (all area outside the Honouliuli Gulch). Within Site 146, McAllister noted old ranching walls, salt work reminas, and coral pits used by the Hawaiians for cultivation of certain plants, such as bananas and sugar cane. The other thirteen sites are all outside of the Project Area.

The first six sites are in the upland section of Honouliuli, *mauka* of the 'Ewa coral plain and Pu'uokapolei . Site 133 is a possible *heiau*, a small enclosure at the foot of Pu'u Kānehoa. It was still standing during McAllister's day, and local residents informed him of its sacred nature. Site 134 is Pu'u Kuina Heiau, located in a gulch at the foot of Mauna Kapu. Only traces of a

largeterrace remained. Site 135 is a series of enclosures *makai* of Pu'u Kuina Heiau. McAllister believed that the walls marked *kuleana* lots. Site 136 is a small platform near Mauna Kapu, a sacred site, possibly an altar. Site 137 is Pu'u Ku'ua Heiau, plotted on a ridge near Pu'u Ku'ua; it had been modified for use as a cattle pen; some areas had been cleared for pineapple cultivation or planted with ironwoods. Site 138 is Pu'uokapolei Heiau, which had been on the *makai* side of the hill before it was destroyed. The stones of the structure had been crushed in a nearby rock crusher. McAllister was also told that there was once a cave on the hill, in which Kamapua'a and his grandmother lived (McAllister 1933:107-108).

The last eight sites recorded by McAllister are adjacent to Pearl Harbor or the coast. Site 139 is Kalanamaihiki Ko'a (fishing shrine) at Kapapapuhi Point (north of the current study area). McAllister described it as "two large rough stones about 2.5 feet in size, with six or seven smooth stones averaging 1 foot in size in a small pile adjoining the larger stones." Site 140 is a 4-5 acre fishpond on Laulaunui Island in West Loch, opposite Kapapapuhi Point. McAllister recorded the entire West Loch of Pearl Harbor as Site 141, Kaihuopala'ai. Although some versions of the legend of the traveling mullet (see Section 3.1, Mythological and Traditional Accounts) say that there was a fishpond called Kaihuopala'ai, McAllister recorded that local informants said there was never a fishpond by that name here; rather it was the name for the loch. Site 142 is Kapamuku, or Pamoku fishpond, a 3-acre fishpond, located south of the current study area, opposite the tip of Waipi'o peninsula. Site 143 is 'Oki'okiolepe fishpond, south of Loko Pamoku. The walls of this 6-acre fishpond were made of coral. As mentioned, Site 146 was used to represent the entire 'Ewa Plain.

McAllister records Site 144 as the location of fish traps and a fishing shrine described by Stokes in his study of the fishtraps of Pearl Harbor. This is the location of the fishtraps Kapākule (Pākule) and Kepo'okala, as described by Samuel Kamakau (1976:88). McAllister listed Site 145 as Pu'uloa, a legendary site where the first breadfruit was planted. It is not known whether Pu'uloa referred to is the *'ili* of Pu'uloa or the harbor of Pu'uloa, or an area within the *'ili* near the harbor. Site 146 covers the entire 'Ewa coral plain. This includes historic features, such as cattle walls and the walls near the Pu'uloa Salt Works, pre-Contact sites such as habitation, agricultural, and fishpond sites recorded by early European explorers, and paleontological sites, where in recent years many fossil bird bones have been discovered (McAllister 1933:108-110).

Between McAllister's 1930s study and the flurry of work that began in 1969, there are only a few sporadic pieces of research, which are not well documented. In 1933, Dr. Kenneth P. Emory recorded a well-preserved house site and a possible *heiau* (later destroyed by sugar cane cultivation) in the western part of the coral plains (Sinoto 1976:1). In 1959, William Kikuchi removed a number of burials from a burial cave site (Bishop Museum Site OA-B6-10) at the Standard Oil Refinery, which was subsequently destroyed (Barrera 1975:1). Kikuchi recovered 12-16 incomplete primary and/or secondary burials cached in a sinkhole or crevice exposed during construction activities near the big bend in Malakole Road (Kikuchi 1959; Davis 1990b: 146, 147). In 1960, Yoshi Sinoto and Elspeth Sterling visited a house site (BPBM. Site OA-B6-8) within 'Ēkaha Nui Gulch. "Around this elevation (1200 feet), along the sides of the stream, were seen remains of many terraces and some house sites" (Sterling and Summers 1978:37). In 1962, Lloyd Soehren recorded another secondary human burial in a sinkhole at the BarbersPoint Naval Air Station (Davis 1990a:147). In 1966, Lloyd Soehren carried out salvage excavations at a possible fishing shrine (BPBM. Site # 50-OA-B6-13). The site was reported as destroyed by

construction (Barrera 1975:1), but Davis relocated the shrine and performed additional excavations in 1982 (Davis 1990a:148).

Table 2. Previous archaeological work in Honouliuli and Pu'uloa

Author	Report Type	Location
Thrum 1906	Heiau study	Hawaiian Islands
McAllister 1933	All island survey	O'ahu Island
Kikuchi 1959	Site letter report	Barbers Point
Bowen and Soehren 1962	Burial Discovery	Barbers Point
Soehren 1964	Site letter report	Waimanalo Gulch
Lewis 1970	Reconnaissance survey	Barbers Point (harbor area)
McCoy 1972	Survey	Pu'uloa Elementary School Site
Hommon 1973	Survey and Excavations	Honouliuli
Barrera 1975	Archaeological & reconnaissance survey	Barbers Point (harbor area)
Clark and Connolly 1975	Reconnaissance survey	Barbers Point (harbor area)
Oshima 1975	Reconnaissance survey	Barbers Point
Sinoto 1976	Cultural resources survey	Barbers Point (harbor area)
Bordner 1977a	Reconnaissance survey	Kalo'i Gulch
Bordner 1977b	Reconnaissance survey	Makaiwa Gulch
Clark 1977	Reconnaissance survey	Puu O Kapolei
Connolly and Clark 1977	Reconnaissance survey	Puu O Kapolei
Davis 1978	Scholarly paper	Barbers Point (harbor area)
Davis and Griffin 1978	Archaeological Survey	Barbers Point (harbor area)
Hawai'i Marine Research Inc. 1978	Geoarchaeological reconnaissance	Barbers Point (harbor area)
Kirch 1978	Land snail study	Barbers Point (harbor area)
Sinoto 1978a	Reconnaissance Survey and Burial Salvage	NAVMAG -West Loch
Sinoto 1978b	Archaeological & Paleontological salvage	Barbers Point (harbor area)
Barrera 1979	Archaeological survey	West Beach
Clark 1979	Reconnaissance survey	Barbers Point (harbor area)
Cleghorn 1979	Reconnaissance survey	Barbers Point
Davis 1979a	Emergency excavations	Barbers Point (harbor area)
Davis 1979b	Emergency excavations	Barbers Point (harbor area)
Davis 1979c	Archaeological survey	'Ewa Marina Community
Jourdane 1979	Reconnaissance Survey	'Ewa Marina Community
Komori and Dye 1979	Archaeological testing	West Beach
Sinoto 1979	Cultural resources survey	Barbers Point (harbor area)
Ahlo 1980	Reconnaissance survey	Solid Waste Processing Facility
Davis 1980	Research design	Barbers Point
Kirch and Christensen 1980	Lard snail study	Barbers Point (harbor area)
Christensen and Kirch 1981	Land snail study	Barbers Point (harbor area)
Hammatt and Folk 1981	Archaeological and Paleontological	Barbers Point (harbor area)
Davis 1982	Academic paper	Barbers Point
McCoy et al. 1982	Proposal for investigations	Barbers Point (harbor area)
Neller 1982	Scholarly study	Barbers Point
Ahlo and Hommon 1983	Reconnaissance survey	Barbers Point (harbor area)
Bordner and Silva 1983	Reconnaissance survey	Waimānalo Gulch

Author	Report Type	Location
Davis 1983	Archaeological & Paleontological Excavations	Barbers Point
Ahlo and Hommon 1984	Test excavations	Barbers Point (harbor area)
Hammatt 1984a	Reconnaissance survey	Kahe Point
Hammatt 1984b	Reconnaissance survey	Ewa Marina Community
Haun and Kelly 1984	Research resign	Naval Air Station
Tuggle 1984	Survey report	Naval Air Station
Barrera 1985	Archaeological survey	West Beach
Neller 1985	Review and evaluation	West Beach
Barrera 1986	Archaeological Investigations	West Beach
Davis and Haun 1986	Intensive survey and test excavations	West Beach
Davis et al. 1986a, b	Research design	West Beach
Haun 1986a	Reconnaissance survey	Kapolei Town
Haun 1986b	Reconnaissance survey	Kapolei Town
Athens & Pietrusewsky 1987	Burial documentation	Iroquois Point
Davis and Haun 1987	Intensive survey & test excavations	West Beach
Dicks et al. 1987	Reconnaissance survey	West Loch
Rosendahl 1987a	Reconnaissance survey	Kapolei Town
Rosendahl 1987b	Reconnaissance survey	Ko Olina Resort
Rosendahl 1987c	Reconnaissance survey	West Loch
Rosendahl 1987d	Reconnaissance survey	Kapolei Golf Course
Welch 1987	Reconnaissance survey	Naval Air Station
Davis 1988a	Subsurface Survey	'Ewa Gentry
Davis 1988b	Reconnaissance survey	Barbers Point HECO
Kennedy 1988a	Reconnaissance survey	'Ewa Gentry
Kennedy 1988b	Field Report	Waiau-Campbell Industrial Park
Rosendahl 1988	Reconnaissance survey	Camp Malakole
Sinoto 1988a	Reconnaissance survey	'Ewa Golf Course
Sinoto 1988b	Reconnaissance survey	Makakilo Golf Course
Bath 1989a	Petroglyph study	Waimānalo Gulch
Bath 1989b	Burial documentation	Kahe
Bath 1989c	Burial documentation	West Loch – Hō'ae'ae Point
Burgett and Rosendahl 1989	Subsurface archaeological testing	North of O.R.&L.
Hammatt and Shideler 1989a	Archaeological assessment	Barbers Point (harbor area)
Hammatt and Shideler 1989b	Reconnaissance survey	Kahe Point
Carlson and Rosendahl 1990	Inventory survey	Kaomi Loop Subdivision
Cleghorn and Davis 1990	Archaeological and paleontological	Barbers Point (harbor area)
Collin and Kennedy 1990	Burial documentation	Pu'uloa Golf Course
Davis 1990a	Archaeological and paleontological study	Barbers Point (harbor area)
Davis 1990b	Archaeological and paleontological	Barbers Point (HECO area)
Davis et al. 1990	Survey and Test Excavations	Ewa Marina Community
Hammatt and Shideler 1990	Inventory survey	West Loch Bluffs
Hammatt, Robins, et al. 1990	Inventory survey	Makaiwa Hills
Hammatt, Shideler, et al. 1990	Inventory Survey	'Ewa Villages
Kawachi 1990	Inadvertent Burial find	Campbell Industrial Park
Miller 1990	Inadvertent Burial find	Barber's Point, Nimitz Beach
Rosendahl 1990a	Letter report	Kapolei Golf Course

Author	Report Type	Location
Rosendahl 1990b	Archaeological Survey and Test Excavations	'Ewa Marina Community
Davis and Burtchard 1991	Inventory Survey	NAVMAG-West Loch
Dunn et al. 1991	Inventory Survey and Test Excavations	'Ewa Marina Community
Folk 1991	Reconnaissance Survey	Kapolei Town
Goodman and Cleghorn 1991	Surface Survey	Laulani Fairways Housing
Kennedy 1991	Subsurface testing	Pu'uokapolei
Hammatt 1991	Reconnaissance Survey	Honouliuli Livestock Park
Hammatt and Shideler 1991a	Archaeological assessment	Barbers Point (harbor area)
Hammatt and Shideler 1991b	Inventory Survey	St. Francis Medical Center West
Haun et al. 1991	Survey report	Naval Air Station
Burgett and Rosendahl 1992	Inventory survey	Barbers Point (harbor area)
Charvet-Pond and Davis 1992	Data Recovery	West Beach
Cleghorn and Anderson 1992	Inventory survey	Kahe Point
Hammatt and Folk 1992	Subsurface testing	Barbers Point (harbor area)
Erkelens 1992	Archaeological survey	Naval Air Station
Folk 1992	Subsurface Testing	Barbers Point
Hammatt 1992	Inventory Survey	Palikea
Jayatilaka et al. 1992	Survey and Test Excavations	Hawai'i Prince Golf Course
Kennedy et al. 1992	Inventory Survey	Pu'uloa Golf Course
Shideler et al. 1992	Assessment	Kahe Point
Trembly et al. 1992	Burial documentation	West Beach
Davis 1993	Archaeological and paleontological	Barbers Point (harbor area)
Glidden et al. 1993	Data recovery excavations	Paradise Cove
Goodman et al. 1993	Reconnaissance Survey	20-acre Commercial Project
Jones 1993	Fossil coral reefs study (Ph.D. dissertation)	Hawaiian Islands
Landrum and Schilz 1993	Reconnaissance and subsurface testing	Naval Air Station
Miller 1993	Data recovery	Barbers Point (harbor area)
Nakamura et al. 1993	Inventory survey	Makakilo
Pantaleo and Sinoto 1993	Inventory survey	Ewa Gentry
Hammatt and Shideler 1994	Archaeological assessment	Barbers Point (harbor area)
Hammatt et al. 1994	Inventory survey	Barbers Point (harbor area)
Tuggle 1994	Inventory survey	Barbers Point
Davis et al. 1995	Archaeological & Paleontological	Barbers Point (harbor area)
Dye 1995	Burial documentation	Barbers Point
Franklin 1995	Data Recovery	Ewa Marina Community
Hammatt and Shideler 1995	Data recovery plan	Barbers Point (harbor area)
Jourdane 1995	Burial documentation	Paradise Cove
Yoklavich et al. 1995	CRM Overview	Barbers Point
Corbin et al. 1996	Reconnaissance Survey	Laulaunui Island
O'Hare et al. 1996	Intensive survey and testing	Naval Air Station
Athens et al. 1997	Cultural resources, paleoenvironmental	'Ewa Plain:Naval Air Station
Schilz and Landrum 1996	Test Excavations	Barbers Point
Spear 1996	Reconnaissance Survey	Kapolei Town
Borthwick 1997	Archaeological assessment	Palehua, Honouliuli
Hammatt 1997	Inventory survey	Pu'uloa
Hammatt and Chiogioji 1997	Reconnaissance Survey	Corridor in Honouliuli
Jensen and Head 1997	Reconnaissance Survey	NAVMAG-West Loch

Author	Report Type	Location
Tuggle 1997a	Cultural resource inventory	Naval Air Station
Tuggle 1997b	Synthesis	'Ewa Plain
Tuggle and Tomonari 1997a,b	Cultural resource inventory survey	Naval Air Station
Wickler and Tuggle 1997	Cultural resources, Inventory Survey	Naval Air Station
Wolforth and Wulzen 1997	Data Recovery	West Loch Estates
Wulzen and Rosendahl 1997	Data Recovery	Barbers Point Nimitz Beach
Goodfellow et al. 1998	Data Recovery	West Loch
Hammatt and Shideler 1999	Inventory survey	Waimanalo Gulch
Magnuson 1999	Reconnaissance Survey	Farrington Hwy.
McDermott et al. 2000	Data recovery	Barbers Point (harbor area)
Elmore et al. 2001	Honouliuli	Pu'u Kapolei/Fort Barrette
Ostroff et al. 2001	Inventory survey	Pu'uokapolei
Tulchin et al. 2001	Inventory survey	'Ewa Shaft Renovation
McIntosh and Cleghorn 2003	Inventory survey	'Ewa Gentry Makai
Cordy and Hammatt 2003	Archaeological assessment	Barbers Point, North of O.R.&L.
O'Hare et al. 2005	Field Check	Kapolei Property
O'Hare et al. 2004	Documentation of Plantation Infrastructure	North of O.R.&L.
Terry et al. 2004	Archaeological Inventory Survey of Two	North of O.R.&L.
Hoffman et al. 2004	Archaeological Inventory Survey	Between OR&L and Barbers

5.2 Previous Archaeological Work near Honouliuli town

Beginning in the late 1970s, archaeological research has been conducted in Honouliuli in the general vicinity of the present study area (Figure 22). Work has been focused on the West Loch Estates (east of the current Project Area), Pearl Harbor Naval Magazine (NAVMAG) – West Loch (east of the current Project Area), the 'Ewa Gentry project (south of the Project Area), and 'Ewa Villages (south of the Project Area).

5.2.1 West Loch Estates

An archaeological reconnaissance survey (Rosendahl 1987c) was conducted in association with the development of the 232-acre "West Loch Estates" Residential Increments I and II (including golf course and parks) project, which lies to the east of the present study area, in the section of the Honouliuli Taro lands adjacent to Pearl Harbor. This project covered portions of the old town of Honouliuli, the focus of population in the early historic period (and possibly earlier). This study identified a modern cemetery (Site 3319) with a remnant pre-Contact deposit, two historic sites of minimal integrity with some possible pre-Contact deposits (Site 3318 and 3320) at Kapapapuhi Point, a significant pre-Contact deposit with trash pits, fire pits and at least one human burial (Site 3321), a buried fishpond (Site 3322), an historic fishpond (Site 3323) built in the 1890s during the construction of the OR& L railroad, and a buried pond field system (Site 3324) (Rosendahl 1987c:7, 9). It was noted that some artifacts "indicate the possibility of pre-1900 occupation" (Rosendahl. 1987c:8). As noted in the final reconnaissance survey report (Dicks et al. 1987:28) for the surface and subsurface reconnaissance survey, an effort was also made to relocate McAllister's Site 139, Kalanamaihiki Ko'a (fishing shrine). The archaeologists found a small boathouse and dock in the area and concluded that the shrine had been destroyed since McAllister's survey in the 1930s.

A total of 21 radiocarbon dates were determined; at Site 3321, the cultural deposit, the age of a lower cultural deposit was dated to A.D. 540-880, while an upper deposit was dated to A.D. 1327-1640. For the buried fishpond (Site 3322), ages ranged from A.D. 70-610 in the lowest layer to A.D. 1160-1410 in the upper layer. For the buried pond field systems (Site 3324), ages ranged from B.C. 400-A.D. 240 (interpreted as the original surface of the upper valley) in the lowest layers to A.D. 1430-1952 in the upper layers of upper valley area and A.D. 1020-1280 in lower valley area. In summary, the authors (Dicks et al. 1987:78-79) concluded that agricultural use of the Honouliuli Stream floodplain for pondfield cultivation of taro may have begun in the lower valley segment as early as A.D. 1000, while cultivation of the upper valley pondfields may have begun as early as the thirteenth and fourteenth centuries. Site 3321in the upper valley may have been a habitation locus established as early as the mid-sixth to mid-ninth century (Wolforth et al. 1998).

In 1989, a burial was found on Ho'ae'ae Point (formerly called Papapuhi Point), when someone was digging under a mango tree on a residential property. There is no follow-up report (Bath 1989) to whether the bones were left in place or disinterred. The burial was given the site designation 50-80-13-4816.

Figure 22. U.S. Geological Survey topographic map, showing previous archaeological survey areas in relation to the Project Area

5.2.2 NAVMAG – West Loch

In 1978, Sinoto conducted an archaeological reconnaissance survey on a 32-acre portion of NAVMAG-West Loch. A sinkhole 200 miles inland and northwest of 'Oki'okiolepe Fishpond was found, containing ten human burials (Site 50-80-13-2310). The historic artifacts found in the pit, indicated that the pit was probably used by the Chinese in the historic period as a family crypt (Sinoto 1978a).

Davis and Burtchard (1991) conducted an archaeological inventory survey of a 36-acre lot for a proposed housing area in the Pu'uloa portion of NAVMAG-West Loch in 1991. No archaeological sites were found. They concluded that extensive alteration to the landscape due to military land disturbance had erased all surface traces of pre-Contact habitation.

In 1992, a crew from Archaeological Consultants of Hawai'i, Inc. (ARCH) conducted an archaeological inventory survey with subsurface testing, and later data recovery at the proposed Pu'uloa Golf Course (Kennedy et al. 1992). A total of 72 sites were identified, 47 from the pre-Contact/early historic period and 25 sites associated with ranching, military training, and modern quarrying. Radiocarbon dates of these habitation, agricultural, and ceremonial sites indicate that traditional Hawaiian use extended from A.D. 1090 to 1695.

An overview survey of the NAVMAG Lualualei was completed by Ogden Environmental and Energy Services in 1977 (Landrum et al. 1977). A total of ten sites had been previously recorded during the West Loch survey, three in the Honouliuli section, one within Pearl Harbor (Site 140, Laulaunui Island), five on Waipi'o peninsula, one in both (salt works), and one encompassing all lands (Pearl Harbor Navy Base). In Honouliuli, the sites were Site 141, Kaihuopala'ai (West Loch), Site 142, Loko Pamoku or Kapamuku, Site 143, 'Oki'okiolepe Fishpond, and salt works at Honouliuli (no site designation). NAVMAG-West Loch is considered part of the Pearl Harbor Navy Base (Site 50-80-13-9992) due to its importance during World War II. The site was listed as a National Historic Landmark in 1966, on the National Register of Historic Places (NRHP) in 1966, on the State Inventory of Historic Places (SIHP), in 1971, and on the State Register of Historic Places in 1971 (Landrum et al. 1977:160).

In 1996, a crew from Paul H. Rosendahl, Ph.D., Inc. (PHRI) completed a Phase I archaeological reconnaissance survey of the 1,483 acres of land at the U.S. Naval Magazine – West Loch Branch (Jensen and Head 1997). This survey covered the southern section of Waipi'o peninsula on the east side of West Loch, Laulaunui Island, the Naval Reservation on the west side of West Loch, and the West Loch Outleased Cultivated Lands, which included the National Wildlife Refuge. Only 25% of the outleased lands were actually surveyed. The PHRI crew found that most of the outleased area had been bulldozed for sugarcane cultivation. Only a small strip adjacent to West Loch was unmodified. In the West Loch Outleased Lands, eight features were recorded; all but one was associated with military use of the area. The seven military sites consisted of six concrete slabs (Sites 50-80-13-5040, 5080, 5081, 5133, 5134), a metal container (5080), and a pressure tank (5133). The one non-military site (4971) was a cave with a partially blocked (blocked with roof fall) entrance that the crew members believed should be investigated in the future to see if it at one time was used as a pre-Contact or historic burial site (Jensen and Head 1997:85).

In 1996, a field reconnaissance of Laulaunui Island and fishpond was conducted by the State Historic Preservation Division (Corbin et al. 1996) to determine if restoration of the fishpond was possible and if the site would be a good candidate to be used as an educational tool. The crew simply walked to the island from the West Loch Waterfront Park; water depth varied from one to four feet. Five concrete structures, probably built by the military, were observed. The fishpond was surrounded by mangroves and was silted in; portions of a coral wall (about 500 ft long) around the pond were still intact, and a concrete gate allowed water to circulate into the pond.

5.2.3 'Ewa Villages

In 1990, Cultural Surveys Hawaii conducted an archaeological reconnaissance survey of a 616-acre area, which included three extant plantation villages, (Renton, Tenney, and Varona Village), the sites of three former plantation villages (C Village, Mill Village, Middle Village), and other sites associated with the Ewa Plantation infrastructure (Hammatt, Shideler, et al. 1990:i). The survey found no evidence of any pre-Contact activity within the survey area and recommended further documentation of some of the ruined plantation structure sites.

In 1996, Scientific Consultant Services (Spear 1996) conducted an archaeological survey in an area west of the Tenney and Varona plantation villages and north of the Honouliuli Treatment Plant. No archaeological sites were identified.

5.2.4 'Ewa Gentry Project

In the initial reconnaissance (Kennedy 1988a) of the 1,016 acre 'Ewa Gentry survey area, no surface evidence of potentially significant pre-Contact remains was found. The old OR&L railroad bed/right of way (Site 50-80-12-9714) did form a portion of the *mauka* boundary. According to historic maps, a Filipino Camp for sugarcane workers once existed near the intersection of the OR&L bed and a cane road near Ft. Weaver Road, but the archaeologists did not find any surface remains for this camp.

A subsequent subsurface exploration was undertaken. Eighteen backhoe trenches were excavated; however, "no evidence of past in situ cultural activity was found anywhere in the 'Ewa Gentry Project Area" (Davis 1988).

An inventory survey was conducted in 1993 by Aki Sinoto Consulting (ASC) (Pantaleo and Sinoto 1993) for the 'Ewa Gentry Off-Site Drainage System. This proposed drainage Project Area is a narrow strip that extends along the western boundary of NAVMAG West Loch, and is adjacent to the southern non-contiguous parcel (TMK 9-1-010:002) for the current Project Area. An 1897 map of Pearl Harbor indicated that the OR&L railroad, salt pans, and a fishpond were within this Project Area; only the railroad bed was found during the ASC survey. Iron flumes and concrete culverts (one with an inscribed date of July 1935) used for sugarcane irrigation were found bulldozed to the edge of the sugar cane fields near the dropoff to the shoreline of Pearl Harbor. These were not considered historically significant due to the absence of structural and locational integrity. No further archaeological work was recommended for this project prior to commencement of construction of the drainage system.

In 2003, Pacific Legacy (McIntosh and Cleghorn 2003) conducted an archaeological survey of the proposed 'Ewa Gentry Makai Development Project Area, which is adjacent to the southern

(*makai*) boundary of the 'Ewa Gentry Project Area for the 1988 surface and subsurface inventory surveys (Kennedy 1988a; Davis 1988).

5.2.5 Previous Archaeology in the Current Project Area

As noted previously, and as discussed in more detail in the next section, a 546-acre portion of the current Project Area (the southeastern section) was previously surveyed in 1990 by a crew from Cultural Surveys Hawai'i. In 2005, a field assessment was conducted over the entire current Project Area by archaeologists from the firm Archaeological Consultants of the Pacific, Inc. (Elison and Kouneski 2005). The archaeologists found one "stone-faced hill" in the northern section of the Project Area (north of Farrington Highway), but did not describe it further. The report presents recommendations for field work in the different sections of the Project Area, concluding that the majority of the Project Area is farm land and did not need to be surveyed. Only the area around Honouliuli Gulch, and other areas of natural vegetation in the northern section needed to be surveyed.

Section 6 Traditional Land Use In Honouliuli Ahupua'a

The *ahupua'a* of Honouliuli is the largest traditional land unit on the island of O'ahu. Honouliuli includes all the land from the western boundary of Pearl Harbor (West Loch) westward to the 'Ewa/Wai'anae District Boundary with the exception of the west side of the harbor entrance, which is in the *ahupua'a* of Pu'uloa (the 'Ewa Beach/Iroquois Point area). This comprises approximately 12 miles of open coastline from One'ula westward to Pili O Kahe. The *ahupua'a* extends *mauka* (almost pie-shaped) from West Loch nearly to Schofield Barracks, and the western boundary is the Wai'anae Mountain crest running *makai* to the east ridge of Nānākuli Valley.

Not only is there a long coastline fronting the normally calm waters of leeward O'ahu, but there are also four miles of waterfront along West Loch. The land immediately *mauka* of the Pacific coast consists of a flat karstic raised limestone reef forming a level nearly featureless "desert" plain marked in pre-contact times (previous to sugar cultivation) by a thin or non-existent soil mantle. The microtopography is notable in containing countless sinkholes in some areas caused by chemical weathering (dissolution) of the limestone shelf.

Along the eastern flank of the Wai'anae Mountains, numerous gulches have contributed to the alluvial deposits over the coastal limestone shelf. The largest of the gulches is Honouliuli Gulch, which drains into West Loch. The gulches are generally steep-sided in the uplands and generally of a high gradient until they emerge onto the flat 'Ewa plain. The alluvium they have carried has spread out in delta fashion over the *mauka* portions of the plain, which comprises a dramatic depositional environment at the stream gradient change. These gulches are generally dry, but during seasonal Kona storms carry immense quantities of runoff onto the plain and into the ocean. As typical drainages in arid slopes they are either raging uncontrollably, or are dry and, as such, do not form stable water sources for traditional agriculture in their upper reaches. The Honouliuli gulches generally do not have valleys suitable for extensive irrigated agriculture; however, this lack is more than compensated for by the rich watered lowlands near West Loch.

Honouliuli Ahupua'a, as a traditional land unit, had abundant and varied resources available for exploitation by early Hawaiians. The "karstic desert" and marginal characterization of the limestone plain, which is the most readily visible terrain, does not do justice to the *ahupua'a* as a whole. The richness of this land unit is marked by the following available resources:

1) 12 miles of coastline with continuous shallow fringing reef, which offered rich marine resources.

2) Four miles of frontage on the waters of West Loch, which offered extensive fisheries (mullet, *awa*, shellfish), as well as frontage suitable for development of fishponds.

3) The lower portion of Honouliuli Valley in the 'Ewa plain offered rich level alluvial soils with plentiful water for irrigation from the stream as well as abundant springs. This land would have stretched well up the valley.

4) A broad limestone plain, which because of innumerable limestone sinkholes, offered a nesting home for a large population of avifauna. This resource may have been one of the early attractions to human settlement.

5) An extensive upland forest zone extending as much as 12 miles inland from the edge to the coastal plain. As Handy and Handy (1972:469) have pointed out, the forest was much more distant from the lowlands here than it was on the windward side, but on the leeward side was more extensive. Much of the upper reaches of the *ahupua'a* would have had species-diverse forest with *kukui*, *'ōhia*, sandalwood, *hau*, *ti*, banana, etc.

Within this natural setting, archaeological and traditional sources show a general pattern of three main areas of settlement within the *ahupua'a*: a coastal zone, the Honouliuli taro lands, and inland settlement at Pu'u Ku'ua.

6.1.1 The Coastal Zone - Kalaeloa (Barbers Point), Ko'olina (West Beach)

Kalaeloa (Barbers Point)

Archaeological research at Barbers Point has focused on the areas in and around the newly constructed Deep Draft Harbor (Barrera 1975; Davis and Griffin, 1978; Hammatt and Folk, 1981, McDermott et al. 2000). Series of small clustered shelters, enclosures and platforms show limited but recurrent use at the shoreline zone for marine-oriented exploitation. This settlement covers much of the shoreline with more concentrated features around small marshes and wet sinks. Immediately behind the shoreline, under a linear dune deposit, is a buried cultural layer believed to contain some of the earliest habitation evidence in the area.

The attraction of the area to early Hawaiians was the plentiful and easily exploited bird population. Particular evidence for taking of petrels occurs at Site -2763 (Hammatt and Folk, 197:213). Initial heavy exploitation of nesting seabirds and other species in conjunction with habitat destruction probably led to early extinction. There is some indication of limited agriculture in mulched sinkholes and limited soil areas. Considering rainfall, this activity would have been limited, but probably involved tree crops and roots (sweet potatoes). The archaeological content of the sites indicates a major focus on marine resources.

Davis and Griffin (1978) distinguish functional classes of sites, based on surface area size and argues that the Barbers Point settlement consists of functionally integrated multi-household residence groups. Density contours of midden (by weight) and artifacts (by numbers) plotted for residence sites by Hammatt and Folk (1981) generally indicate narrowly defined spatial foci of discard, possibly indicating continuous use, or at least with no refurbishing or additions to the structures through time (Hammatt and Folk 1981). The focus is small habitation sites, typically lacking the full range of features found in large permanent residence complexes such as high platforms, complex enclosures, and ceremonial sites.

Ko'ōlina (West Beach)

There are three available studies on the Ko'ōlina Project Area (Davis et a. 1986a; Davis et al. 1986b; and Davis and Haun 1987).

Davis documents around 180 component features at 48 sites and site complexes consisting of habitation sites, gardening areas, and human burials. Chronologically the occupation covers the

entire span of Hawaiian settlement, in what Davis and Haun describe as "one of the longest local sequences in Hawaiian prehistory" (Davis and Haun 1987:37). The earliest part of the sequence relates to the discovery of an inland marsh, and early dates were also obtained for the beachfront site and an inland rock shelter.

6.1.2 Honouliuli Taro Lands

Centered around the west side of Pearl Harbor at Honouliuli Stream and its broad outlet into the West Loch are the rich irrigated lands of the *'ili* of Honouliuli, which give the *ahupua'a* its name. The major archaeological reference to this area is Dicks, Haun, and Rosendahl (1987) who documented remnants of a once-widespread wetland system (*lo'i* and fishponds) as well as dryland cultivation of the adjacent slopes. The Project Area is within this environmental zone.

The area bordering West Loch was clearly a major focus of population within the Hawaiian Islands, and this was a logical response to the abundance of fish and shellfish resources in close proximity to a wide expanse of well-irrigated bottomland suitable for wetland taro cultivation. The earliest detailed map (Malden 1825) shows all the roads of southwest O'ahu coalescing and descending the *pali* (cliff) as they funnel into the locality (i.e. Honouliuli Village). Dicks et al. (1987:78-79) conclude, on the basis of 19 carbon isotope dates and 3 volcanic glass dates that "Agricultural use of the area spans over 1,000 years." Undoubtedly, Honouliuli was a locus of habitation for thousands of Hawaiians. Pre-Contact population estimates are a matter of some debate but it is worth pointing out that in the earliest mission census (Schmitt 1973:19) 1831-1832, the land (*'āina*) of Honouliuli contained 1026 men, women, and children. It is not clear whether this population relates to Honouliuli Village or the entire *ahupua'a*, but the village probably contained the vast majority of the district's population. The nature of the reported population structure for Honouliuli (less than 20% children under 12 years of age) and the fact that the population decreased more than 15% in the next 4 years (Schmitt 1973:22) suggests that the prehistoric population of Honouliuli Village may well have been significantly greater than it was in 1831-1832. A conservative estimate would be that tens of thousands of Hawaiians lived and died at Honouliuli Village.

6.1.3 Pu'uku'ua: Inland Settlement

Documentation of inland settlement in Honouliuli Ahupua'a is more problematic in that there are relatively few documented archaeological sources. However, it is probable that the area around Pu'uku'ua, on the east side of the Wai'anae Ridge seven miles inland of the coast, was a Hawaiian place of some importance.

In 1899, Hawaiian Newspaper *Ka Loea Kālai'āina* relates a story of Pu'uku'ua as "a place where chiefs lived in ancient times" and a "battle field," "thickly populated." The article summarizes:

> There were two important things concerning this place. (1) This place was entirely deserted and left uninhabited and it seems that this happened before the coming of righteousness to Hawai'i Nei. Not an inhabitant is left. (2) The descendants of the people of this place were so mixed that they were all of one class. Here the gods became tired and returned to Kahiki [Sterling and Summers 1978:33].

McAllister recorded three sites in this area, two *heiau* (134, 137) (Pu'u Kuina and Pu'uku'ua, both destroyed) and a series of enclosures in Kukuilua which he called "kuleana sites" (McAllister 1933). On the opposite side of the Wai'anae range, along the trail to Pōhākea Pass, Cordy (2002:36) states "Kākuihihewa was said to have built (or rebuilt) Nōi'ula, a *pō'okanaka heiau* (1,300 sq. m.) in Hālona in upper Lualualei, along the trail to Pōhākea Pass leading into 'Ewa, ca. A.D. 1640-1660" (Cordy 2002:36). There is no direct archaeological evidence available to the authors' knowledge that intensive Hawaiian settlement occurred here, but it is considered as a place of high probability, based on the above indications. John Papa 'Ī'ī (1959) described a journey that Liholiho took which led him and an entourage through inland Honouliuli and over Pōhākea Pass. Geographically, the area receives sufficient quantities of water and would have had abundant locally available forest resources.

6.1.4 Summary

On the basis of archaeological studies, informed by historic records, the following may be concluded:

1) There are three areas of Hawaiian settlement in the *ahupua'a*; two are well-documented and one is problematic:

   a. the extensive limestone plain with recurrent use habitations for fishermen and gatherers and sometime gardeners;

   b. the rich cultivated lands of Honouliuli 'ili for extensive wetland taro and clearly the *ahupua'a* population center; and,

   c. the uplands around Pu'uku'ua associated with *kauwā* residence but probably used for agriculture and forest resources.

2) Honouliuli is designed as a unit to contain all the geographic elements of a typical Hawaiian valley *ahupua'a*, except they are arranged geomorphically in an atypical relationship. The *ahupua'a* is not organized around a single drainage network but shares the west portions of Waikele drainage in its upper reaches. A typical and highly advantageous characteristic for human subsistence is included in a vast coastline and fringing reef, an extensive limestone plain which would support only limited agriculture but would be excellent for bird catching in early times, and a huge expanse of sloping forest land. The richest forest land for foraging for wood, birds, feathers, etc. would have been the east slope of the Wai'anae Range. The surveys by Bordner (1983) and Hammatt and Shideler (1999) at Waimānalo Gulch indicated no evidence of Hawaiian occupation, but the gulch has been impacted in modern times (Bordner 1983).

3) The *makai* slope was not a major thoroughfare. We can see some very limited evidence of part-time agriculture in and around gulches and two foci of sparse habitation. The first is limited to *makai* portions of gulches and lava flats. This habitation is considered a *mauka* component or continuing of the Ko'ōlina coastal settlement rather than an independent focus. The second focus, separated from the first by a barren zone, is generally above the 800-foot elevation. This *mauka* habitation which could have been supported by seasonal dry land planting and forest foraging may be the lower portion of a

thinly scattered, but widespread zone of settlement which stretches eastward and northeast along the east Wai'anae Range slopes and may increase in intensity along the more watered lands forming the *mauka* western boundary of Honouliuli.

4) There is to date no archaeological evidence of high status residence in Honouliuli. Large residential structures are not present along the Pacific shoreline where they would be expected. The late prehistoric occurrence of chiefs' houses is not apparent, perhaps because the ocean shoreline, although rich in marine resources, is uninviting for sport and unsuitable for fishponds. The chiefly focus of 'Ewa District was Waipi'o. Whatever activities of this class occurred in Honouliuli would have been in or near the rich lands fronting West Loch (the *'ili* of Honouliuli). Concerning status associations with Honouliuli, it is interesting to note the connection of the Pu'uku'ua settlement with slaves (*kauwā*), the lowest class of Hawaiians (Sterling and Summers 1978:33).

5) The focus of population and agriculture within the *ahupua'a* of Honouliuli was the *'ili* of Honouliuli. There is good reason to assume, given the lack of intensive agricultural resources in other prehistoric times, all other habitation zones were economically and socially co-dependent.

Section 7 Community Consultation

Throughout the course of this study, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about traditional cultural practices associated with the Project Area. CSH contacted the individuals listed on Table 3 by letter, e-mail, telephone, and in personal contact. In the majority of cases, a letter along with a TMK map and a USGS topographical map of the Project Area were mailed with the following text:

> In collaboration with Environmental Communications, Inc., Cultural Surveys Hawai'i (CSH) is conducting a Cultural Impact Assessment for the proposed East Ho`opili Project, 'Ewa District, Honouliuli Ahupua'a, O'ahu Island (TMK: [1] 9-1-010:002; 9-1-017:004, 059; 9-1-018:001, 004, 072; 9-2-001:001). A map of the Project Area is enclosed for your reference.
>
> The purpose of this assessment is to identify any traditional cultural practices associated with the Project Area, past or present, pursuant to Hawaii revised Statutes 343. We are seeking your *kokua* and guidance regarding the following aspects of our study:
>
> General history and present and past land use of the study area;
>
> Knowledge of cultural sites that may be impacted by the project, for example historic sites, archaeological sites, and burials;
>
> Knowledge of traditional gathering practices in the study area, both past and on-going;
>
> Cultural associations with the study area through legends, traditional use or otherwise;
>
> Referrals of *kūpuna* or anyone else who might be willing to share their general cultural knowledge of the study area, and the surrounding *ahupua'a* lands.
>
> Any other cultural concerns the community might have related to cultural practices within or in the vicinity of the Project Area.
>
> The focus of this study is to document the potential impacts to cultural practices or resources of the proposed Project Area. If you wish to voice any cultural concerns or provide input on any of the above, please contact Kēhaulani Souza of Cultural Surveys Hawai'i at (808) 262-9972. Ms. Souza may also be contacted by e-mail at ksouza@culturalsurveys.com.

The individuals, organizations, and agencies attempted to be contacted and the results of any consultations are presented in Table 3: Community Contact List

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114 Kailua, HI 96734 Ph.: (808) 262-9972 Fax.: (808) 262-4950
Maui 16 S. Market St., #2N Wailuku, HI 96793 Ph.: (808) 242-9882 Fax.: (808) 244-1994
Kaua'i P.O. Box 498 Lawai, HI 96765 Ph.: (808) 245-4883

(November 17, 2005 date first sent)
January 26, 2006

Subject: **Cultural Impact Assessment for the East Kapolei Community Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu Island [TMK9-1-010:001, 9-1-017:004, 059, 072; 9-1-018:001, 004, 9-2-001:001] approximately 1,585 acres**

Aloha:

At the request of D. R. Horton-Schuler Division, Cultural Surveys Hawai'i is conducting a Cultural Impact Assessment (CIA) for the East Kapolei Community Project, Honouliuli Ahupua'a, 'Ewa District, O'ahu (TMK: 9-1-010:001, 9-1-017:004, 059, 072; 9-1-018:001, 004, 9-2-001:001) (Figure 1 and 2).

The purpose of the Cultural Impact Assessment is to assess potential impacts to traditional cultural practices as a result of future development of the proposed East Kapolei Community Project. The development will include residential, commercial, educational and recreational facilities.

We are seeking your *kōkua* or help and guidance regarding the following aspects of our study:

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

I invite you to contact me, Kēhaulani Souza at (808) 262-9972 or send me an e-mail at ksouza@culturalsurveys.com if you have any information you would like to share.

Me ka ha'aha'a,

Kēhaulani Souza

www.culturalsurveys.com info@culturalsurveys.com

Figure 23: Contact letter sent to organizations and individuals in Table 3

Table 3: Community Contact List

Name	Affiliation	Comments
Ailā Willliam	Hui Mālama I Nā Kūpuna O Hawai'i Nei, Wai'anae Representative	Made referral: Shad Kane
Cayan, Coochie	Former O'ahu Island Burial Council member	Made referrals: Shad Kane, Nettie Tiffany, and the Neighborhood Board.
Crail, Gail	Former resident of Honouliuli	Mrs. Crail remembers the Project Area always covered with sugar cane. She suggested that we contact the Murata and the Iwata families who have lived in Honouliuli a long time.
Eaton, Arline	*Kupuna* at Iroquois Elementary School	See Traditional Cultural Practices below for response.
Futoshi, Shinogi	Resident of Honouliuli	Mr. Futoshi mentioned that the east side of old Fort Weaver Road was all wetlands. He also mentioned that this area was well know for artesian wells and the current site of the first artesian well is not the original site, it was further back near the current *lo'i* (taro pond).
Hirata, Richard "Dickey"	President of Hawaii Plantation Village; Raised at the 'Ewa Plantation	Made referral: Arakawa family.
Iwata, Tom	Resident of Honouliuli for 90 years	Mr. Iwata has lived in Honouliuli all his life and remembers Pipeline Village above old Fort Weaver Road; *lo'i* behind his house; and the entire Project Area being covered with sugar cane.
Ka'eliwai, George	Hawaiian Civic Club of 'Ewa/Pu'uloa	Mr. Ka'eliwai would gather oysters from Pu'uloa.
Kalili, Christina	Raised in Tenney Village	Made referral: Soma 'Ohana
Kane, Shad	Makakilo, Kapolei, Honokai Hale Neighborhood Board Member	Made referral
Malama, Tesha	Former 'Ewa Neighborhood Board member	Made referrals: Mary Serrao, Arline Eaton.
Murakami, Mae	Raised in Honouliuli. Grandparents and parents owned Honouliuli Shokai Store	Mrs. Murakami's grandfather Katsuhei Murata started the Honouliuli Shokai store on Old Fort Weaver road. She noted: "the store was like a little Wal-Mart with its own tailor, butcher and groceries. They also

Name	Affiliation	Comments
		imported and exported to Japan. It was "ahead if its time." She also mentioned that her grandfather set up a credit system for the people in the community. Mae also added that Chocolate Beach was a childhood place where they would often go to gather clams, and fish from the ocean.
Nāmu'o, Clyde	Administrator at Office of Hawaiian Affairs	In a letter to CSH dated 2-20-06 Office of Hawaiian Affairs stated that they had no comment at this time.
Nakamatsu, Charles	Raised in the 'Ewa Plantation in "C" Village.	See Traditional Cultural Practices below for response
Oshiro, Richard	Former 'Ewa Plantation employee	See Traditional Cultural Practices below for response
Paishon, Frank	Raised in Tenney Village	Mr. Paishon mentioned east of the Project Area was a great place to go fishing AT Chocolate Beach. They would catch oysters, clams, and all types of crabs.
Ramos, Rodolfo	Chair of 'Ewa Task Force	Mr. Ramos mentioned that they would go fishing at Chocolate Beach, east of the Project Area, and they would catch all types of crabs and pick oysters and clams. He said as far as he remembers that area was always sugar cane.
Sato, Melvin	Raised in Ewa Plantation "C" Village	Mr. Sato mentioned that Chocolate Beach was a great place to fish and gather oysters and clams. He said his uncle Charles Nakamatsu would know more about the Project Area.
Soma, Kenneth	Retired 'Ewa Plantation and current resident	See Traditional Cultural Practices below for response
Soma, Millie	Raised in 'Ewa Plantation Tenney Village	Mrs. Soma was born in 1935 and has lived in 'Ewa Plantation ever since. She has no major concerns.
Tiffany, Nettie	O'ahu Island Burial Council, Kahu for Lanikuhonua	Mrs. Tiffany commented the land has been altered over the years by the plantation. She suggested that consultation be conducted with people from the plantation
Quintal, Leti	Raised in 'Ewa Plantation, Secretary for the Immaculate Conception Church in 'Ewa	Mrs. Quintal remembers the Project Area always covered with sugar cane. She also made referrals of people in the community Mr. Kojima and his wife, Shgeru Yawata, and Lida and Pio Barbieto.

7.1.1 Biographical Sketches of the Interview Informants

Aunty Arline Wainaha Pu'uloa Eaton

Aunty Arline Eaton is 79 years old, born in 1927. She was raised in the old traditional Hawaiian style, speaking her native language (Hawaiian) and traveling by canoe. She was raised in the area known as Keahi and Kūpaka, now known as Iroquois Point/'Ewa. She also lived for a short time in Kalihi before moving to Keahi. Her Papa Brede was the head of operations for the Dowsett Ranch. She has been the *kupuna* at Iroquois Elementary School for 19 years. Aunty Arline is one of the oldest and most knowledgeable Hawaiians for this area of O'ahu.

Richard "Dickey" Hirata

Mr. Hirata is 72, born in 1934 at the 'Ewa Plantation with the assistance of a midwife. He was raised in one of the many 'Ewa Plantation Villages called Lower Village, which was adjacent to the Project Area. Mr. Hirata's parents came to O'ahu to work in the plantation. Mr. Hirata worked for the 'Ewa Plantation for nine months then went into the army for three years. He then graduated from North Carolina State with a Bachelors Degree in Electrical Engineering. He later returned home and accepted a job with the State of Hawai'i as a Development Manager. He retired from the State of Hawai'i and now is the President of the Hawai'i Plantation Village, located in Waipahū.

Charles Yosei Nakamatsu

Mr. Nakamatsu is 85 years old, born in 1920. He was raised in the Ewa Plantation in "C" Village. He is second generation Okinawan and his parents came to Hawaii to work in the plantation. Mr. Nakamatsu worked for the plantation for 18 years as a welder then went to work for an air conditioning company.

Richard Oshrio

Mr. Oshiro is 78, born in 1928. His parents, Guikichi and Kamado Oshiro, were first generation immigrants from Okinawa. They came to Hawaii to work at the 'Ewa Plantation. Mr. Oshiro has a long history with the 'Ewa Plantation; for 77 years he has lived and worked in 'Ewa. He first lived in the Waimānalo Village, which is now known as the Ko'ōlina area, then in 1943 his family moved closer to the plantation's "C" Village, then to Tenney Village where he resides today. He retired in 1990 from the plantation.

Kenneth Soma

Mr. Soma is 80, born in 1926. He is full-blooded Japanese. His parents came from Japan to work at the 'Ewa Plantation. He was raised in the plantation and later worked for the plantation as a heavy equipment operator. After the Ewa Plantation closed, Oahu Sugar took over so he retired from Oahu Sugar. He also worked as a director at the Mililani Mortuary for 26 years. Today he enjoys his life in the same area that he was raised in 'Ewa.

Section 8 Traditional Cultural Practices

The northern portion of the Project Area is adjacent to Farrington Highway and the east end of the Project Area is on the boundary of the Honouliuli Taro Lands; a once-widespread wetland used for the cultivation of taro (*lo'i* and fishponds), as well as dryland cultivation of the adjacent slopes, which may have been utilized as early as A.D. 1000 (Dicks et al. 1987:78-79). East of the Project Area is West Loch (Kaihuopala'ai) of Pearl Harbor, which offered extensive fishponds (mullet, milkfish, shellfish), as well as shoreline frontage suitable for development of more fishponds. However, the majority of the Project Area is plateau land which would not have been as extensively modified or utilized based on environmental factors.

Discussions of specific aspects of traditional Hawaiian culture during information gathering interviews and "talk story" sessions are incorporated throughout this section as they may relate to the Project Area. The interviewees are represented by first and last initials with CSH denoting the Cultural Surveys Hawai'i interviewer. Some interviewees gave permission for CSH to include pertinent excerpts from interviews on Honouliuli conducted by CSH in the past for this assessment.

8.1 Gathering for Plant Resources

In the Māhele records it was documented that taro was primarily abundantly grown on the eastern edge of the Project Area (see Figure 9 & 10). Also, according to a documentation included in a study of land use in Honouliuli, it was mentioned that Kukui trees were abundant in the area, "...and of an 'old kukui tree' which was one of the boundary markers between Honouliuli and Hoaeae. This boundary runs along the present Kunia Road, and the tree is another indication that there was once a forest at this point" (Frierson 1972:12).

Given the ecosystem diversity of coastal lowland, transition, and upland forest zones in Honouliuli Ahupua'a, it is likely that one of the primary traditional cultural practices associated with the present project area would have been the gathering of native plant resources. Table 4 lists Honouliuli lowland plants and uses with columns for "common/Hawaiian name", "scientific name" and "use" based on research conducted by Barbara Frierson (1973) on native plant species present in Honouliuli before 1790, in addition to plant use recorded by Isabella Abbott (1992).

Table 4. Native Plants in Honouliuli

Hawaiian/Common Name	Scientific Name	Use
Hala, pandanus	*Pandanus odoratissimus*	Weaving
Hau, hibiscus	*Hibiscus tiliaceus*	Cordage
Milo	*Thespesia paradisiaca*	Wood used for bowls
Neneleau, Sumac	*Rhus sandwicensis* *Rhus chinensis*	Unknown
'Ilima	*Sida cordifolia*	Leis, medicine

Hawaiian/Common Name	Scientific Name	Use
Kou	*Cordia subcordata*	Bowls
Makaloa, sedge	*Cyperus laevigatus*	Mats (Abbott)
Pili grass	*Heteropogon contortus*	Thatch
Kakonakona, grass	*Panicum torridum*	Unknown
Honohonowai	*Commelina nudiflora*	Unknown
Ma'o, cotton	*Gossypium tomentosum* *Abutilon incanum*	Flowers used as dye for kapa (Abbott)
'Ūlei	*Osteomeles anthyllidifolia*	Branches used for fishing nets (Abbott)
'Uhaloa	*Waltheria americana*	Medicine (Abbott)
Koali'ai	*Ipomoea cairica*	Cordage (Abbott)
Pā'ū o Hiiaka	*Jacquemontia sandwicensis*	Unknown
Ko'oko'olau	*Bidens* sp.	Used as tea (Abbott)
'Ulu, breadfruit	*Artocarpus incisus*	Food
Taro	*Colocasia esculenta*	Food
Niu, coconut	*Cocos nucifera*	Food, liquid

The accessibility of Honouliuli lands, including the present Project Area, to the Hawaiians for gathering or other cultural purposes would be radically curtailed during the second half of the nineteenth century. As noted above in this evaluation, by the 1870s, herds of cattle grazing across the 'Ewa Plain likely denuded the landscape of much of the native vegetation. Subsequently, during the last decade of the nineteenth century, the traditional Hawaiian landscape was further altered by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century sugar cane cultivation was the dominating land use activity within the Project Area. Cane cultivation. –and the sense that the Project Area was private property– made it difficult for employees of the 'Ewa Plantation to get access inside the Project Area, restricting right of entry. .

Based on the evidence gathered for this evaluation, at present no contemporary or continuing cultural practices occur within the Project Area specifically.

8.2 Taro in Hawaiian Culture in Regards to the Project Area

It has been documented that taro was grown in the wetlands adjacent to the Project Area and a few interviewees remembered those times as well. In this section, the cultural connections of Hawaiians to taro will be discussed.

Taro has an intimate connection to the Hawaiian culture. Taro (*kalo*; *Colocassia esculenta*) was probably brought to Hawai'i by the earliest Polynesian voyagers and has been a staple crop on the islands ever since. Taro is intimately connected through myth to the origins of Hawaiians as a people. There are different versions of this myth, but all of them make the connection between the first-born Hawaiian and the taro plant, according to Mary Kawena Pukui:

> The first Hāloa, born to Wākea and Ho'ohoku-ka-lani, became a taro plant. His younger brother, also named Hāloa, became the ancestor of the people. In this way, taro was the elder brother and man the younger-both being children of the same parents [Handy and Handy 1972:80].

The physical attributes, the growth patterns, and the propagation of taro all reflect the structure of Hawaiian kinship and an obvious relationship to the human body. The main plant in the center is the *makua* (parent), the smaller plants budding out of the *makua* are the *'ohā* (offspring). The center of the leaf where it connects to the stem is the growth center of the veins of the leaf and is called the *piko* (belly button). The stem is called *ha*, which is also a word for breath, the basis of life. The cycle of planting is a reflection of the human life cycle. When the taro is harvested the *kalo* (corm) is cut right below the green top, the cut top is called the *huli* (turning, returning or transforming). The *huli* is replanted and the family of taro once again continues its growth cycle. The generations of taro are thought of interchangeably with the generations of Hawaiians as reflected in the saying "*Kalo kanu o ka 'āina*"-literally "taro planted on the land" but figuratively referring to successive generations of natives (Pukui 1983:157). Both the *'ohā* and the *makua* can be used as *huli*, but as in a family, the '*oha* (child) must be separated to become independent of the parent and – to become a parent itself. If it is not, it remains a dependent attachment, overshadowed by the leaves of the *makua*. Another saying, *I makika'I kekalo I ka 'ohā*-"the goodness of the taro is judged by the young plant it produces" (Pukui 1983:133), is a metaphor for the parents being judged by the behavior of their children.

All parts of the taro plant are used for food: the corm is cooked and eaten as table taro or steamed and pounded into *poi*; the stem can be steamed and used in various soup and stew dishes; the young leaves are used for *laulau* and *lū'au* dishes mixed with fish, squid, pork, chicken or beef. Generally, the leaves are not harvested from the plants designated for corm production because continuous cutting makes the corms soft and tasteless (*loli*). Taro growers who grow leaf for home use or commercial purpose always have specially designated *lū'au* patches. It is traditional Hawaiian practice to use all the coarse green cuttings that are the by-product of the harvesting of the corns as food for the pigs. This green material, when cooked and fed to the animals, is highly nutritious. For this reason, raising pigs is traditionally is symbiotic relationship to taro production. In a traditional taro field, no space is wasted. The *lo'i* are used for the taro and any extra space on the banks is used for subsistence, utilitarian and medicinal plants, such as bananas, *noni*, and *ti*.

The practice of taro cultivation most resembles gardening in its scale and methods. Much of the work is undertaken by an individual or family, and is performed by hand. The *lo'i* and banks are beautifully manicured, ostensibly for weed control but the result is aesthetically like a garden. Yet, taro production remains viable even on this small scale because of its high per-acre productivity.

Nowhere else in the world was taro cultivation more developed than in Hawai'i (Kirch 1985:215). It was the staple for the hundreds of thousands of Hawaiians before European contact. It was grown in areas with sufficient rainfall (above 30-50 inches per annum) or under dryland management. In areas of suitable water sources extensive and sophisticated irrigated systems were developed for its cultivation. The social requirement for the planning, development, and maintenance of theses irrigated systems was a stable political system and community cooperation. Although the cultivation and maintenance of individual fields could be the purview of single families or individuals, the maintenance of the water supply system on which the entire system depended had to be organized on a community level.

Although less than 100 varieties of taro survive today, there may have been, at one time, as many as 300 varieties in the islands, distinguished by leaf shape, corm, morphology, color and use. The labels of wetland and dryland taro do not refer to different taro varieties, but only to different cultivation practices. All varieties of taro can be grown in dryland fields and all but a few in *lo'i* (flooded fields). Today there are only a few widely-grown commercial varieties. Mechanical devices are used, such as tillers and small tractors; in some cases PVC pipes have replaced earthen or stone lined *'auwai* or waterways, and commercial fertilizers are routinely used. A typical taro crop will take from 10 to 14 months to mature. With modern farming methods taro is one of the most productive per-acre staple crops in the world. However, in spite of these modern overlays, the bulk of the labor is done by hand in the context of the family and the essence of a traditional taro growing community. Cooperation in management of water and land resources remains an integral part of this lifestyle.

In pre-contact Hawaii, during the late prehistoric era, as documented by archaeological studies, taro cultivation was practiced in virtually every suitable locality, including floodplains in windward valleys with perennial streams, open lava and beach flats near stream systems, and moist leeward slopes. Taro was such an important crop it was even grown in artificial microenvironments created by mulching pits in lava fields.

Since European contact there has been a slow but steady decline in taro cultivation. In the late nineteenth and early twentieth centuries, many of the large taro growing areas were given over to rice planting. Taro cultivation returned on a smaller scale to these areas after development of the California rice industry. Today, commercial Hawaiian taro cultivation is confined to a few areas in the islands: Hānalei/Waioli, Hanapēpē and Waimea on Kaua'i, Waikāne/Waiāhole and Haleiwa on O'ahu, Honokohau, Ke'anae/Wailuanui on Maui, and Waipi'o Valley on the island of Hawai'i.

Taro cultivation was a recurrent theme of the LCA testimonies for individual kuleana in Honouliuli. There were four individual kuleana LCAs in the Project Area. The testimonies indicated that these LCA's contained at least one *lo'i* as well as house lots, *kula* and fishponds (see Figure 10 and Table 1). The LCA's and assorted taro patches are depicted on a 1878 map of Honouliuli Taro Lands (see Figure 9)

'Ewa was well known for its rare *kai* variety of taro that was very flavorful as well as the ability to reproduce itself over a ten year span. The taro of 'Ewa was poetically referred to a man's love for a 'Ewa women that was so strong he would never leave:

> "The *kai* was native to 'Ewa and was often referred to as Kai o 'Ewa. . . . An 'Ewa *kama'āina* described this in 1899: When planted, it sends up shoots, more shoots and still more shoots. Again and again it will send up new shoots, filling the mounds until they mixed with the taro of other mounds. . . . This description (*Ka Loea Kalani'āina*), June 3, 1899) indicates that in the flat, wet lowlands of 'Ewa this famous taro was grown in mounds (*pu'epu'e*) as in marshy localities. The article quoted above says that '*Kai koi* multiplies itself over and over with one planting and often last as long as ten years. No other variety or locality can equal this. This fragrant taro was likened to a woman with whom a man falls in love, and it was said that anyone who married a native of 'Ewa would come and settle there and would never leave, because of the *kai koi* of 'Ewa. Our Hawaiian writer describes two other varieties of *kai: Kai 'ele'ele*, black *kai*, has a black stalk, with dark skin on stems and leaves; its corm was tough and hard to pound. *Kai kea*, white *kai*, had a light-colored stem and leaves; the skin (of the corm) was red, but the flesh was dark like that of black *kai*, the corm likewise tough. In 1931 we collected four varieties of *kai: kai koi*, whose corm was white, vase of stalk pink, petiole pink, with a pink edge on the leaf; *kai kea* or *keokeo* with white corm, white base, whitish stalk with red margin, and a leaf with white edge and white center and pinkish veins; *kai 'ula'ula* (red *kai*) with corm flesh purplish white, and cortex of corm reddish purple, base red, stalk green with black streaks becoming light green and pink above, and finally, *kai-uliuli* (dark-*kai)* with white corm and lavender cortex, red to pink base, whitish and dusky green petiole with red and white margin, and leaf with a slightly reddish center. It was the *kai keokeo* which was described as being fragrant *('ala)*. From this was made the *poi* reserved for the chiefs (*poi ali'i)* [Handy and Handy 1972:471].

As indicated earlier the traditional settlement patterns as depicted in mid 1800s, *Mahele* documents was focused on taro cultivation in the wetlands of Honouliuli Ahupua'a.

Mr. Soma and Mr. Oshiro both mentioned a *lo'i* near Korean Camp (see Figure 19), which was adjacent to the south end of the Project Area. Aunty Arline Eaton shared her memories of gathering taro in the Honouliuli taro lands while looking at an 1825 (see Figure 7) map during the interview:

> AE: Oh, well then I wasn't even born but I know it (taro) was there, because even up to my time we had to go up there. Even though they had over there, they also had it down here, this was dry land taro. And everybody said, taste good to me. You know I never died, I'm still here. . . . All this has to do with water, fresh water, because this is where they used to have the *lo'i* . . . that's why these areas, were well water, but people don't use the names. Hey, have certain *kalo*, cause when you pick the ones over here it's a reddish color, and if you go up here (Project Area) it's a more purple color. It's the soil I think, and each one has a different taste. It's still *ono* [good], its *poi*! Yeah and the purple. I remember they having all these different *kine* [kinds] like *ulaula kalo, poneia*, I like the *poniponi* [taro varieties] one. But people never know, you tell them and they tell you its

> something else. I don't like to explain because people don't understand. But now that your coming with this stuff [maps], now you know that its there.

Currently there is no taro cultivation in the Honouliuli Taro Lands that is within the Project Area.

8.3 Pa'akai (Salt Making)

Pa'akai (salt) was one of the condiments used by Hawaiians for curing fish and other foods. Out of all Polynesia, Hawaiians were the only group of people to produce salt from the sea by properly constructing salt pans. These salt pans were noticed and described by Reverend William Ellis:

> We saw a number of their pans, in the disposition of which they display great ingenuity. They have generally one large pond near the sea, into which the water flows by a channel cut through the rocks, or is carried thither by natives in large calabashes. After remaining there some time, it is conducted into a number of smaller pans, about six to eight inches in depth, which are made with great care, and frequently lined with large evergreen leaves, in order to prevent absorption. Along the narrow banks or partitions between the different pans, we saw a number of large evergreen leaves placed. They were tied up at each end, so as to resemble a shallow dish, and filled with sea water, in which the crystals of salt were abundant [Ellis 1839 in Buck 1964:71].

Salt making was abundant through out the 'Ewa district as documented on old maps. Mr. Oshiro mentioned that there was a Chinese man that would gather salt near the shore, at Chocolate Beach. He stated "there were 12 salt beds, the man would let the water in and trap the salt, then the salt would dry up and he would shovel the salt." Aunty Arline Eaton also mentioned that they never had to worry about not having enough salt growing up as a child:

> AE: During that period of time they had salt works in the area (looking at the 1927 map see figure 16). . . . yeah that's what it was, and there's that flume. We used to ride on this thing . . .you go right under here . . . but they don't have the salt works anymore, sad yeah? Yeah, that had the salt pans, all the way down to Ku'alaka'i, all the way to Kalaeloa, the whole thing. From Pu'uloa, which is Pearl Harbor, working all the way around pass Keone'ula, all the way down past where Ku'alaka'i is. That's almost the ending, though they maybe had one or two close to Kalaeloa. Because a lot of the boats came in there. I think, like how they have, [on the map]. That's true, exactly what you have over there. See it has Ewa Plantation, but there was water all in this area. The salt pans are really, actually, no more pan, but its coral, and you can see. But they called it that ["salt pans"]. But now that's all made out of the reef, the coral, all in that area.
>
> CSH: *So your family would gather salt?*
>
> AE: Oh, yeah. We never worried about salt, because it's right there. And had the '*alaea* [type of ocherous earth, mixed with the salt] down at Keone'ula, we go

> pick that up too. Because the water comes all in here it [the map] doesn't show you that. But water used to come all in that area. I tell people, this whole area here had water before we even had the *paniolo* here.

The Project Area is just back from the coast therefore the environment is not conducive to the "old" style of salt making.

8.4 Marine Resources

The sea and West Loch was a rich resource and the Hawaiian people were traditionally expert fishermen. Fish, shellfish, and other invertebrates of all types supplied the Hawaiian diet with a rich source of protein. The gathering of seaweed and salt was practiced by Hawaiian women. Today many people continue to fish along the shoreline south of the Project Area. In traditional Hawaiian times, Hawaiians going to and from marine resources at the coast, fishery resources of West Loch and its fishponds, and the low-lying mud-flats used for salt production may have crossed the present Project Area.

All the interviewees shared information about the abundant marine life just east of the Project Area, at Pu'uloa. They (Arline Eaton, Richard Oshiro, Kenneth Soma, Charles Nakamatsu and Dickey Hirata and many others) all mentioned a beach called Chocolate Beach and a well-known place to go fishing called Three Stones (see figure 16). At these places, they would often catch *pāpio*, mullet, oysters, clams, and all types of crab such as Hawaiian crab and *haole* crab and *limu* as well. They would use shrimp for bait, or as Mr. Soma mentioned "we would often get guts from the slaughter house and use that for bait." Mr. Nakamatsu also added " we would go get meat or slop from Kahuā Ranch or the Hawaiian Meat Market then we would go catch crab, such as Haole Crab, Kanaka Crab which is the reddish brown Crab and we would dig for clams and oysters". Mr. Nakamatsu and Mr. Soma both mentioned that on the way to the beach they would cut the Koa Haole tree before they would go fishing to use as a fishing pole". Below, Aunty Arline Eaton expresses her *mana'o* (thoughts) on different fishing resources:

> . . .That was beautiful, because you can get like *'ō'io* [bonefish], *u'u* [soldierfish], *enenue* [pilotfish], *kala* [surgeonfish], *manini* [surgeonfish], *moano* [goatfish], *he'e* [octopus], *pāpa'i* [crabs], and many others. And it was clean, and nowadays I don't know about what you'd get. . . . Moku'ume'ume we called it, Ford Island. And had oysters, you know they said never had, but they had oysters over there. But you know we never went over there and took a lot, we'd just take what you want, that's all. Why you need plenty, you don't need them all. You want some more, then you could always go back over there and go get some more. Each area had its own certain kind. . . . It's different from the one over here, because of the kind of *limu* [seaweed] they eat. Cause over here is lots of *līpo'a* [brown seaweed], so you can smell them [in the fish, yeah?]. Yeah, and you could smell it at high tide too. But now, you no can smell the *limu*. And when you open up *manini* you can look inside what they eat. They only eat *limu*, they only eat certain kinds, and they're clean. That's why you can just take 'em and throw them on the fire, you no need clean 'em. *Manini* don't eat just any kind stuff, still *ono*.

CSH: *I remember last time I talked to you, you said your tutu papa would go to Waikiki in a canoe?*

AE: . . . and go out to Kou, to Waikiki, yeah, to Kahanamoku's place. Bernice Kahanamoku and I are good friends, that's Duke's only sister. He only had one sister out of all of them. When we went down there we couldn't come home, cause it would take time to get over there. So, we would sleep over night over there.

CSH: *He would paddle all the way over there in a four man canoe?*

AE: Well, I was young, but yeah I would just go with him, and he would paddle. I guess he would take stuff over there, not that they didn't have fish over there, but certain places get certain kinds. We have all different kinds of *limu* over here, any kind you could think of, but if you want to get *limu kohu*, good *kine*, you go Kaua'i. We have over here, but not as *ono*, you know what I'm saying? Like here the *'ō'io* was known to be one of the best in Pu'uloa, so that's why *tutu papa* would bring. That's what Duke's papa used to like.

Limu was very important in the Hawaiian diet and is defined by Pukui & Elbert (1971) "A general name for all kinds of plants living under water, both fresh and salt, also algae growing in any damp place in the air, as on the ground, on rocks and other plants." Aunty Arline spoke of the different types of *limu* in the 'Ewa area:

This whole area was known as the house of the *limu*. You can imagine the smell, but we never bothered. And now no more *limu*. Had plenty . . . and now no more. Well you know, there was a heavy influx of immigrants coming in. First they look at it, oh this is plenty, lets pick em (*limu*) all up, and they'd go and sell em. They'd never think about just pick their part, no they'd take the whole thing. So when they'd go, they'd pick up everything. Oh no, had in the locks, in Hō'ae'ae, had to have *limu* over here, all the way out. You know, maybe not as much as you see out there, but they did have *limu* in there because you had the fish. As long as you have the fish inside there, gotta have the *limu* inside there. That's why I said the *limu* is very important. That's why we were teaching the children. Had *līpo'a*, plentiful, but not as much as you would find in Pu'uloa, because of the changing of the ocean and the tide.

You need to have lots of running water back and forth, like waves coming in, going out. That's how that *limu* is strong and fresh. But we also had it in here too, all into this area. Mostly, the kind of *limu* you would find in here is *'ele'ele*. They had, cause of the water, there was a lot of fresh water that went in there. You would find it close up into an area where there is a lot of running water. That's how we knew there had fresh water coming out, can't live without fresh water, all of it needs it.

The Project Area is back from the coast therefore the marine resources will not be affected.

8.5 Burials

East of the Project Area, a pre-contact Native Hawaiian burial was found at Hō'ae'ae Point (Papapūhi Point) in West Loch Estates, and a historic Chinese crypt was found in a cave in the NAVMAG-West Loch area, (see Figure 22). Though none of the interviewees knew of any burials in the Project Area or in the vicinity, Aunty Arline did suggest that if people were living in the area, there is a possibility of burials:

My only thought is that for every person that lives in that area, that's where they bury their people . . .We never said anything. if people died, we'd go over there and they'd bury them right there where the house is. We'd never go four-hundred-million-miles away, its right there. All your *'ohana* stay right in the same area. We never went afar, not in the rural areas.

8.6 Historic Properties

CSH previously performed an assessment of 546-acres of the Project Area in 1990 as part of theWest Loch Bluffs project, which was postponed. During the previous survey CSH identified the following historic features:

Sites 50-80-12-4344 (plantation infrastructure), -4345 (railroad berm), -4346 (northern pumping station), -4347 (central pumping station), and -4348 (southern pumping station).

8.7 Stream Resources

William Puleloa of the DLNR, Division of Aquatic Resources summarizes the importance of streams as a traditional Native Hawaiian cultural resource:

From the earliest days, streams were among the most important natural resources sought after by native Hawaiians. Battles were fought and lives sacrificed for the right to use stream water. The Hawaiians called freshwater wai, and considered it to be sacred. People using wai from streams took only what was absolutely necessary. They were expected to share the wai with others. This was done without greed or selfishness. Such practices gave Hawaiians their word for law, which is kanawai, or the "equal sharing of water." Water was so valuable to Hawaiians that they used the word "wai" to indicate wealth. Thus to signify abundance and prosperity, Hawaiians would say waiwai.

The Honouliuli Stream passes through the northeastern side of the Project Area (north of Farrington Highway), extends through the Honouliuli Taro Lands east of the Project Area and then empties into Pearl Harbor. The stream was the main water source for the lo'i in the Honouliuli Taro Lands. Aunty Arline spoke about the days that her *tutupa* and herself would go up stream in his four-man canoe. The canoe was filled with *i'a* (fish) and *limu* to trade with the people who lived near Honouliuli Stream who cultivated taro. She mentioned that as children they would often gather *'ōpae* and *'o'opu* from the stream. Aunty Arline also stated, "my *tutupa* would visit these people and he would chant in Hawaiian and the people on shore would chant back." This was a common practice of asking for permission to come ashore, visit, and trade. She

also mentioned that the same thing would happen when people would come and visit her and her family in Keahi (Keahi Point in Pu'uloa; see Figure 5). At this time we have not found evidence of any cultural activity currently being practiced within the stream.

8.8 Trails

Trails served to connect the various settlements throughout the District of 'Ewa. Based on nineteenth and twentieth century maps, the primary transportation routes *mauka/makai* and cross-*ahupua'a* correlated closely to the existing major roadways (see Figure 6). John Papa 'I'ī describes a network of Leeward O'ahu trails that in later historic times encircled and crossed the Wai'anae Range, allowing passage from West Loch to the Honouliuli lowlands, past Pu'uokapolei and Waimānalo Gulch to the Wai'anae coast and onward, circumscribing the shoreline of O'ahu ('I'ī 1959:96-98). It seems clear that a major east/west artery from 'Ewa and Kona O'ahu to Wai'anae was the pre-cursor trail that 'Ī'ī was referring to, and what could possibly be the current Farrington High Way. However, today no remnants of the trail remain. (Figure 6). Trails in relation to the Project Area

8.9 *Wahi Pana* (Storied Places)

The concept of *wahi pana* (a place with a story or legend attached to it) is very important in the Hawaiian culture because it is a connection to the past and, therefore, the ancestors. From the name of a place one can know intimate details about the people who lived there, the environment, cultural practices, and historical events that took place. In Hawaiian culture, if a particular spot is given a name, it is because an event occurred there that has meaning for the people of that time. Because Hawaiian culture was based on oral traditions, place names and their stories were an important way of remembering these traditions and ensuring these stories would be passed on to future generations. In Hawaiian thinking, the fact that a place has a name deems it important. Often, spiritual power or *mana* is attached to a place, which increases its importance. On the subject of *wahi pana*, Edward Kanahele writes:

> As a native Hawaiian, a place tells me who I am and who my extended family is. A place gives me my history, the history of my clan, and the history of my people. I am able to look at a place and tie in human events that affect me and my loved ones. A place gives me a feeling of stability and of belonging to my family, those living and dead. A place gives me a sense of well-being and of acceptance of all who have experienced that place [Kanahele, in James 1995:6].

Aunty Arline agrees that it is very important to use the old place names that were given by Hawaiian people because it gives meaning to a specific area (see Figure 5):

> CSH: *How come they don't have Kūpaka on the map? Here's Ke'ahi and Kūpaka, so you lived near the beach then?*
>
> AE: [showing on map] right here, in this area, 'Ewa beach road. Kūpaka goes all the way up to where Parish Drive is. And it was named after Mr. Dowsett and the Parish's, cause they're related, they were the ones that came with Kamehameha. So he lived here, in Ke'ahi, and it was him who gave that name, Kūpaka, for that

> area. So that's why he named that area, and yet there was nothing [nothing there], These people came and they gave all that land to the Dowsetts and the Parish's. [CSH: Liholiho] Yeah, he gave it to them.
>
> CSH: *What did you call this beach?*
>
> AE: Keone O Keahi and Keone O Kūpaka, all of this is Pu'uloa. All the way down till you come to Keone'ula. Actually, it's Keone'ula because that's where that *'alaea* was. A lot of people don't know, but that's the reason why it was named that. It should not be One'ula, it should be Keone'ula. I keep saying that over and over they say, why you have to put that, Keone'ula?
>
> CSH: *So, it's the beach-that-is-red, the red beach?*
>
> AE: Yeah. But of course it doesn't show it now, but at that time, even when I was young, I remember seeing that big mound. Because all of this was fishponds. All in this area, this whole place all the way going down to, I don't like to say, Pearl Harbor the name should be Pu'uloa, until even Manana, all of that had fishponds. This whole area was like that, and salt pans.

Kapapapūhi is a point just east of the Project Area and Aunty Arline Eaton shared a story about this special place that was told to her as a child:

> Oh yeah, you talking about the outside area. Had *pūhi* [eel] all over, but mainly they used that point. There's a *mo'olelo* [story] that goes with that. There was this *pūhi* who is supposed to be, like, king of the area, and the *Tutukane* and the *Tutuwahine* came over there, and the *pūhi* looked and said oooh that *wahine*, I like that one. Well so the *pūhi* make sure plenty *i'a* [marine creatures] around, and one day the *Tutukane* never came, only her went over there, and she was picking *'opihi* [limpets]. Pretty soon she went underneath the water, and he saved her. . . . He loved her, he fell in love with her [*pūhi* king]. And he didn't want to let her go. And she said, Oh please I want to go home, and he said, no you stay with me, don't go, I'll give you everything you want, and you don't have to worry. And she cried, and she cried. Then he found out that boy that came down was not her sweet heart or anything, that was her brother. But you know Hawaiian style! And together they would always go out and go fishing because the father had gone out fishing and got lost, and only had the mama. And the mama wasn't feeling well. So these two [the brother and sister] would help out the grandmama and grandfather and go out. And the *pūhi* felt so sorry, so he said okay but anytime you need help I will always be here. And so every time I see this place and see this name I think of that. I could imagine him just standing over there and looking at her and thinking, oh how he loved her. Yeah that's one of the stories that they had about that. And that was told to me, I don't see it in a book. My papa told me that so I always remembered that. Then there was a song . . . that they would sing, it was so pretty.

Section 9 Conclusion and Recommendations

9.1 Conclusion

Honouliuli is associated with a number of legendary accounts. Many of these concern the actions of gods or demi-gods such as Kāne, Kanaloa, *Māui*, Kamapua'a, the reptile deity (*mo'o*) Maunauna, the shark deity Ka'ahupāhau, and the demigod hero Palila. While there are several references to chiefly lineages and references to the ruling chiefs Hilo-a-Lakapu and Kūali'i, there is no clear reference to powerful chiefs living permanently in Honouliuli.

The accessibility of Honouliuli lands, including the proposed Project Area, to the Hawaiians for gathering or other cultural purposes was radically curtailed during the second half of the nineteenth century. As noted above in this assessment, by the 1870s, herds of cattle grazing across the 'Ewa Plain likely denuded the landscape of much of the native vegetation. Subsequently, during the last decade of the nineteenth century, the traditional Hawaiian landscape was further distorted by the introduction and rapid development of commercial sugar cane cultivation. Throughout the twentieth century, sugar cane cultivation was the dominating land use activity within the Project Area. Cane cultivation – and the sense that the Project Area was private property – restricted access inside the Project Area to employees of 'Ewa Plantation.

Hawaiian organizations, government agencies, community members, and cultural and lineal descendants with ties to 'Ewa were contacted to: (1) identify potentially knowledgeable individuals with cultural expertise and knowledge of the Project Area and its surroundings, and (2) identify cultural concerns and potential impacts within the Project Area. An effort was made to locate informants with ties to 'Ewa and neighboring *ahupua'a* who live, or had lived in the region or who, in the past, used the area for traditional and cultural purposes. For this assessment, Arline Eaton, Richard Hirata, Richard Oshiro, Kenneth Soma, Charles Nakamatsu and other *kūpuna* were interviewed. They mentioned that in the past there was traditional gathering of taro and salt, along with fish such as *pāpio*, mullet, as well as oysters, clams and a variety of crab near the Project Area. They all referred to this area of rich marine resources as Chocolate Beach and Three Stones. The people contacted were not aware of any on-going cultural practices, archaeological sites, trails, or burials within the Project Area. Most of the people contacted mentioned that the Project Area was heavily altered by plantation activities.

Based on what was gathered from the consultation process and the evidence of LCA's and lack of resources, the vast majority of the Project Area was utilized less intensively during traditional times. Additionally the years of sugar cane cultivation left no reason for access. Most of the resources such as taro farming and gathering of marine resources were on the fringing edge or outside of the Project Area. Based on the evidence gathered for this evaluation, at present no contemporary or continuing cultural practices occur within the Project Area specifically.

9.2 Recommendations

No contemporary or continuing cultural practices currently occur within the proposed Project Area. It should be noted that subsurface historic properties associated with former traditional Hawaiian activities in the project area, such as artifacts and cultural layers, may be present despite the decades of modern activities such as ranching and sugar cane. As a precautionary measure, personnel involved in future development should be informed of the possibility of inadvertent cultural finds, and should be made aware of the appropriate notification measures to follow.

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Appendix G

Reserved for Traffic Impact Assessment

Appendix H

Pre-Assessment Consultation Letters for Hawai‘i Revised Statutes, Chapter 343.

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Alan Downer, Administrator, Deputy State Historic Preservation Officer (SHPO)
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room.555
Kapolei, HI 96707

Dear Mr. Downer:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
- Services available 7-days-a-week to support the needs of the community
- Adoption services and facilities
- Spay and neutering services
- Volunteer opportunities for youth and adults
- A dog park for the community

The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary

services will take place. The first floor will contain the animal admissions receiving area, temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

An adoptions lanai will be located on the first floor and consist of a sheltered, open-air space, that contains adoption information, a help desk, and a retail shop. A classroom on this floor will be provided for educational programming, youth camp, and field trips, orientation for new staff members and volunteers, public-animal related activities, and staff meetings. A volunteer check-in area on the first floor will be provided for volunteers to store belongings and check-in with staff and other volunteers. The first floor will also contain offices for staff, computer stations, storage rooms, maintenance rooms, supply rooms, a food preparation room, a grooming room, a laundry room, a reception area, and bathrooms. Patios and lanais will also be provided on the ground floor. The second floor will contain office space and a breakroom for HHS employees and volunteers.

South of the main building, the HHS Ho'opili campus will have six adoption pavilions, including three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, and an approximately 554 sf small animal pavilion. Two approximately 324 sf dog acquaintance areas for potential adopters to meet and greet dogs on a one on one basis will also be provided.

South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into the box culvert northeast of the project site. This swale will need to be enlarged to convey potential runoff from upstream properties. A detention basin is proposed near the north-eastern corner of the project site. The detention basin would be sized to capture runoff from the proposed development, conveying excess runoff to the nearby box culvert.

Access to the HHS Ho'opili Campus will be via an interim driveway constructed off of Old Fort Weaver Road along the northern side of the project site. An interim driveway will be used because this segment of the Old Fort Weaver Road will be removed and realigned as part of the Ho'opili Master Plan. The interim driveway and its future permanent replacement will be designed to comply with CCH regulations. Parking and loading areas along the north and west sides of the project site, connections to utilities, and landscaping consisting of grass, trees, and tropical foliage will also be installed at the project site.

Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new

Ho'opili campus will provide core services and accommodate the needs of approximately half the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

Similar to the HHS Mō'ili'ili campus, the HHS Ho'opili campus will be open for animal admissions, including lost and found services, daily from 7 am to 8 pm, with emergency services available 24/7. Adoption center hours will be Monday through Friday from 11 am to 7 pm, and Saturday and Sunday 10 am to 6 pm. The HHS Ho'opili campus will be closed most major holidays.

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Construction of the HHS Ho'opili Campus is expected to commence in early 2021 with a duration of approximately 2 years. Construction activities are planned to take place during the daytime hours with no night work anticipated to be required.

Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

Please also be advised that you will be provided a 30-day public comment period following the publication of the Draft EA in the State Department of Health, Office of Environmental Quality Control's *The Environmental Notice*.

Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Russell Tsuji, Administrator
Department of Land and Natural Resources
Land Division-Oahu District
1151 Punchbowl Street, Room 220
Honolulu, HI 96813

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Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 03, 2020

LD 1193

Brian Takeda, Planning Project Manager
R.M. Towill Corporation
2024 North King Street, Suite 200 *Via email: rmtowill@hawaii.rr.com*
Honolulu, HI 96819-3470

Dear Sirs:

SUBJECT: **Hawaiian Humane Society Ho'opili Campus**
Request for Pre-Assessment Consultation for
Draft Environmental Assessment
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
TMK: (1) 9-1-181:042

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR's various divisions for their review and comment.

Enclosed are responses received from our (a) Engineering Division, and (e) Land Division, Oahu District. (Comments from our Division of Forestry and Wildlife were submitted previously by them in response to a direct request.) Should you have any questions about the attached responses, please feel free to contact Barbara Lee via email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 24, 2020

LD 1193

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
__Div. of State Parks
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
__Office of Conservation & Coastal Lands
X Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*
X Historic Preservation *(via email: DLNR.Intake.SHPD@hawaii.gov)*

FROM: Russell Y. Tsuji, Land Administrator Russell Tsuji
SUBJECT: **Hawaiian Humane Society Ho'opili Campus, Pre-Assessment Consultation for Draft Environmental Assessment**
LOCATION: 'Ewa Beach, 'Ewa District, Island of Oahu, Hawaii; TMK: (1) 9-1-181:042 (portion)
APPLICANT: **R.M. Towill Corporation on behalf of the Hawaiian Humane Society**

Transmitted for your review and comment is information on the above-referenced subject. Please submit any comments via email to the Land Division at DLNR.Land@hawaii.gov, copied to barbara.j.lee@hawaii.gov by the extended due date of **December 03, 2020**.

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Barbara Lee directly at barbara.j.lee@hawaii.gov. Thank you.

( ) We have no objections.
(☑) We have no comments.
( ) Comments are attached.

Signed: [signature] BC
Print Name: Patti Miyashiro
Division: DLNR-LD-ODLO
Date: Dec 1, 2020

Attachments
Cc: Central Files

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Carty Chang, P.E., Chief Engineer
Department of Land and Natural Resources
Engineering Division
Kalanimoku Building
1151 Punchbowl Street, Room 221
Honolulu, Hawaii 96813

Dear Mr. Chang:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
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Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 03, 2020

LD 1193

Brian Takeda, Planning Project Manager
R.M. Towill Corporation
2024 North King Street, Suite 200 *Via email: rmtowill@hawaii.rr.com*
Honolulu, HI 96819-3470

Dear Sirs:

SUBJECT: **Hawaiian Humane Society Ho'opili Campus**
Request for Pre-Assessment Consultation for
Draft Environmental Assessment
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
TMK: (1) 9-1-181:042

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR's various divisions for their review and comment.

Enclosed are responses received from our (a) Engineering Division, and (e) Land Division, Oahu District. (Comments from our Division of Forestry and Wildlife were submitted previously by them in response to a direct request.) Should you have any questions about the attached responses, please feel free to contact Barbara Lee via email at barbara.j.lee@hawaii.gov. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files

DAVID Y. IGE
GOVERNOR OF HAWAII

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 24, 2020

LD 1193

MEMORANDUM

FROM:

~~TO:~~ **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
__Div. of State Parks
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
__Office of Conservation & Coastal Lands
X Land Division – Oahu District *(via email: DLNR.Land@hawaii.gov)*
X Historic Preservation *(via email: DLNR.Intake.SHPD@hawaii.gov)*

TO:

~~FROM:~~ Russell Y. Tsuji, Land Administrator Russell Tsuji
SUBJECT: **Hawaiian Humane Society Ho'opili Campus, Pre-Assessment Consultation for Draft Environmental Assessment**
LOCATION: 'Ewa Beach, 'Ewa District, Island of Oahu, Hawaii; TMK: (1) 9-1-181:042 (portion)
APPLICANT: **R.M. Towill Corporation on behalf of the Hawaiian Humane Society**

Transmitted for your review and comment is information on the above-referenced subject. Please submit any comments via email to the Land Division at DLNR.Land@hawaii.gov, copied to barbara.j.lee@hawaii.gov by the extended due date of **December 03, 2020**.

If no response is received by the above date, we will assume your agency has no comments. Should you have any questions about this request, please contact Barbara Lee directly at barbara.j.lee@hawaii.gov. Thank you.

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed: CSC
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: Dec 1, 2020

Attachments
Cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref: Hawaiian Humane Society Ho'opili Campus, Pre-Assessment Consultation for Draft Environmental Assessment
Location: 'Ewa Beach, 'Ewa District, Island of Oahu, Hawaii
TMK(s): (1) 9-1-181:042 (portion)
Applicant: R.M. Towill Corporation on behalf of the Hawaiian Humane Society

COMMENTS

The rules and regulations of the National Flood Insurance Program (NFIP), Title 44 of the Code of Federal Regulations (44CFR), are in effect when development falls within a Special Flood Hazard Area (high risk areas). State projects are required to comply with 44CFR regulations as stipulated in Section 60.12. Be advised that 44CFR reflects the minimum standards as set forth by the NFIP. Local community flood ordinances may stipulate higher standards that can be more restrictive and would take precedence over the minimum NFIP standards.

The owner of the project property and/or their representative is responsible to research the Flood Hazard Zone designation for the project. Flood Hazard Zones are designated on FEMA's Flood Insurance Rate Maps (FIRM), which can be viewed on our Flood Hazard Assessment Tool (FHAT) (http://gis.hawaiinfip.org/FHAT).

If there are questions regarding the local flood ordinances, please contact the applicable County NFIP coordinating agency below:

- Oahu: City and County of Honolulu, Department of Planning and Permitting (808) 768-8098.
- Hawaii Island: County of Hawaii, Department of Public Works (808) 961-8327.
- Maui/Molokai/Lanai County of Maui, Department of Planning (808) 270-7253.
- Kauai: County of Kauai, Department of Public Works (808) 241-4896.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: Dec 1, 2020

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Curt Cottrell, Administrator
Department of Land and Natural Resources
Division of State Parks
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Cottrell:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
- Services available 7-days-a-week to support the needs of the community
- Adoption services and facilities
- Spay and neutering services
- Volunteer opportunities for youth and adults
- A dog park for the community

The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary

services will take place. The first floor will contain the animal admissions receiving area, temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

An adoptions lanai will be located on the first floor and consist of a sheltered, open-air space, that contains adoption information, a help desk, and a retail shop. A classroom on this floor will be provided for educational programming, youth camp, and field trips, orientation for new staff members and volunteers, public-animal related activities, and staff meetings. A volunteer check-in area on the first floor will be provided for volunteers to store belongings and check-in with staff and other volunteers. The first floor will also contain offices for staff, computer stations, storage rooms, maintenance rooms, supply rooms, a food preparation room, a grooming room, a laundry room, a reception area, and bathrooms. Patios and lanais will also be provided on the ground floor. The second floor will contain office space and a breakroom for HHS employees and volunteers.

South of the main building, the HHS Ho'opili campus will have six adoption pavilions, including three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, and an approximately 554 sf small animal pavilion. Two approximately 324 sf dog acquaintance areas for potential adopters to meet and greet dogs on a one on one basis will also be provided.

South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into the box culvert northeast of the project site. This swale will need to be enlarged to convey potential runoff from upstream properties. A detention basin is proposed near the north-eastern corner of the project site. The detention basin would be sized to capture runoff from the proposed development, conveying excess runoff to the nearby box culvert.

Access to the HHS Ho'opili Campus will be via an interim driveway constructed off of Old Fort Weaver Road along the northern side of the project site. An interim driveway will be used because this segment of the Old Fort Weaver Road will be removed and realigned as part of the Ho'opili Master Plan. The interim driveway and its future permanent replacement will be designed to comply with CCH regulations. Parking and loading areas along the north and west sides of the project site, connections to utilities, and landscaping consisting of grass, trees, and tropical foliage will also be installed at the project site.

Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new

Ho'opili campus will provide core services and accommodate the needs of approximately half the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

Similar to the HHS Mō'ili'ili campus, the HHS Ho'opili campus will be open for animal admissions, including lost and found services, daily from 7 am to 8 pm, with emergency services available 24/7. Adoption center hours will be Monday through Friday from 11 am to 7 pm, and Saturday and Sunday 10 am to 6 pm. The HHS Ho'opili campus will be closed most major holidays.

Minor construction-related traffic, noise, and air quality (dust) disturbances are anticipated. Construction equipment used for this project may include, but are not limited to: loaders, bulldozers, dump trucks, loader-backhoes, a trencher, grader, water trucks, concrete hauler pumpers, and flatbed trucks. The contractor will be required to observe and comply with all Federal, State, and local laws required for the protection of public health, safety, and the environment.

The contractor will prepare a Best Management Practices (BMPs) Plan for this project. The BMPs Plan will consist of erosion control measures such as planting or hydromulching grass seedling, erecting silt fencing/curtains, berms, and/or other applicable erosion control devices to prevent construction-related soils and silt from mixing with storm water runoff.

Upon the completion of work, areas surrounding the project site that have been affected by construction will be restored as much as practicable to pre-existing conditions. The following will be required:

- All construction-related debris, including excavated material, fill material, and refuse shall be removed from the project site and disposed of properly by the contractor.
- All construction equipment shall be removed from the project site promptly after construction is complete.
- Any temporary modification to existing utilities, such as power or communications lines, shall be repaired to their pre-existing condition.
- Roadways providing access to the site shall be cleared of construction debris and any damage from construction traffic repaired.
- All areas damaged by construction staging shall be restored as much as practicable to preexisting conditions. Exposed ground areas shall be seeded or hydromulched as appropriate.

- Temporary utility lines will be removed from the site and all surplus excavation material and construction debris will be removed and disposed of off-site in compliance with applicable State and County regulations.

Construction of the HHS Ho'opili Campus is expected to commence in early 2021 with a duration of approximately 2 years. Construction activities are planned to take place during the daytime hours with no night work anticipated to be required.

Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

Please also be advised that you will be provided a 30-day public comment period following the publication of the Draft EA in the State Department of Health, Office of Environmental Quality Control's *The Environmental Notice*.

Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. David Smith, Administrator
Department of Land and Natural Resources
Division of Forestry and Wildlife
Kalanimoku Building
1151 Punchbowl St. Room 325
Honolulu, HI 96813

Dear Mr. Smith:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

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The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area, temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

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The contractor will prepare a Best Management Practices (BMPs) Plan for this project. The BMPs Plan will consist of erosion control measures such as planting or hydromulching grass seedling, erecting silt fencing/curtains, berms, and/or other applicable erosion control devices to prevent construction-related soils and silt from mixing with storm water runoff.

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Construction of the HHS Ho'opili Campus is expected to commence in early 2021 with a duration of approximately 2 years. Construction activities are planned to take place during the daytime hours with no night work anticipated to be required.

Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

Please also be advised that you will be provided a 30-day public comment period following the publication of the Draft EA in the State Department of Health, Office of Environmental Quality Control's *The Environmental Notice*.

Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DAVID Y. IGE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET, ROOM 325
HONOLULU, HAWAII 96813

SUZANNE D. CASE
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
FIRST DEPUTY

M. KALEO MANUEL
DEPUTY DIRECTOR - WATER

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

November 23,2020

Log no. 2881

R.M. Towill Corporation
2024 N. King Street, Suite 200
Honolulu, HI 96819
Attn: Mr. Brian Takeda

Dear Mr. Takeda:

The Department of Land and Natural Resources, Division of Forestry and Wildlife (DOFAW) has received your inquiry regarding the Environmental Assessment for the Hawaiian Humane Society's Hoʻopili Campus in ʻEwa Beach on Oʻahu, Hawaiʻi, TMK: (1) 9-1-181:042. The proposed project consists of: constructing a 20,745 square foot two-story building; six adoption pavilions; a dog park; two gazebos; a detention basin; enlarging an existing swale; an interim driveway; parking and loading areas; and landscaping.

State listed waterbirds such as the Hawaiian Duck (*Anas wyvilliana*), Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian Coot (*Fulica alai*) and Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*) have the potential to occur in the vicinity of the proposed project site. It is against State law to harm or harass these species. If any of these species are present during construction activities, then all activities within 100 feet (30 meters) should cease, and the bird should not be approached. Work may continue after the bird leaves the area of its own accord. If a nest is discovered at any point, please contact the Oʻahu DOFAW Office at (808) 973-9778.

DOFAW is concerned about attracting vulnerable birds to areas that may host nonnative predators such as cats, rodents, and mongoose. Additionally, improvements to the facility are likely to increase human activity and may generate more trash and other predator attractants. We recommend taking action to minimize predator presence; remove cats, place bait stations for rodents and mongoose, and provide covered trash receptacles.

The State endangered Hawaiian Short-eared Owl or pūeo (*Asio flammeus sandwichensis*) has the potential to occur in the project site vicinity. Pūeo are a crepuscular species, most active during dawn and dusk twilights. DOFAW recommends twilight pre-construction surveys by a qualified biologist prior to clearing vegetation. If pūeo nests are present, a buffer zone should be established in which no clearing occurs until nesting ceases, and DOFAW staff should be notified.

The State listed Hawaiian Hoary Bat or ʻŌpeʻapeʻa (*Lasiurus cinereus semotus*) has the potential to occur in the vicinity of the project area and may roost in nearby trees. If any site clearing is required this should be timed to avoid disturbance during the bat birthing and pup rearing season (June 1 through September 15). If this cannot be avoided, woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed, or trimmed without consulting DOFAW.

DOFAW recommends minimizing the movement of plant or soil material between worksites, such as in fill. Soil and plant material may contain invasive fungal pathogens, vertebrate and invertebrate pests (e.g. Little Fire Ants, Coconut Rhinoceros Beetles), or invasive plant parts that could harm our native species and ecosystems. We recommend consulting the Oʻahu Invasive Species Committee at (808) 266-7994 in planning, design, and construction of the project to learn of any high-risk invasive species in the area and ways to mitigate spread. All equipment, materials, and personnel should be cleaned of excess soil and debris to minimize the risk of spreading invasive species.

We note that artificial lighting can adversely impact seabirds that may pass through the area at night by causing disorientation. This disorientation can result in collision with manmade artifacts or grounding of birds. For nighttime lighting that might be required, DOFAW recommends that all lights be fully shielded to minimize impacts. Nighttime work that requires outdoor lighting should be avoided during the seabird fledging season from September 15 through December 15. This is the period when young seabirds take their maiden voyage to the open sea. For illustrations and guidance related to seabird-friendly light styles that also protect the dark, starry skies of Hawaiʻi please visit: https://dlnr.hawaii.gov/wildlife/files/2016/03/DOC439.pdf.

DOFAW recommends surveying for rare and endangered plants that may occur in the area. If any of these species are found, please notify DOFAW at (808) 587-0166.

We appreciate your efforts to work with our office for the conservation of our native species. Should the scope of the project change significantly, or should it become apparent that threatened or endangered species may be impacted, please contact our staff as soon as possible. If you have any questions, please contact Koa Matsuoka, Protected Species Habitat Conservation Planning Associate at (808) 587-4149 or koa.matsuoka@hawaii.gov.

Sincerely,

for
DAVID G. SMITH
Administrator

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Kaleo Manuel, Deputy Director
Department of Land and Natural Resources
Commission on Water Resource Management
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Manuel:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
- Services available 7-days-a-week to support the needs of the community
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Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
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Construction Management

November 9, 2020

Mr. Samuel J. Lemmo, Administrator
Department of Land and Natural Resources
Office of Conservation & Coastal Lands
Kalanimoku Building
1151 Punchbowl St., Room 131
Honolulu, HI 96813

Dear Mr. Lemmo:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

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Enclosure

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R. M. TOWILL CORPORATION
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Photogrammetry
Surveying
Construction Management

November 9, 2020

Ms. Colette Machado, Chair
Office of Hawaiian Affairs
560 N. Nimitz Hwy., Suite 200
Honolulu, HI 96817

Dear Ms. Machado:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

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November 9, 2020

Mr. Keith Kawaoka, Deputy Director for Environmental Health Administration
Department of Health
Environmental Planning Office
919 Ala Moana Blvd., Room 312
Honolulu, HI 96814

Dear Mr. Kawaoka:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

From: R M Towill Corporation
To: Brian Takeda
Subject: Fw: DOH Clean Air Branch Comments on EA for Hawaiian Humane Society Ho"opili Campus
Date: Tuesday, November 24, 2020 5:49:57 AM

From: Cab General <Cab.General@doh.hawaii.gov>
Sent: Friday, November 20, 2020 3:33 PM
To: rmtowill@hawaii.rr.com <rmtowill@hawaii.rr.com>
Subject: DOH Clean Air Branch Comments on EA for Hawaiian Humane Society Ho'opili Campus

CAUTION: External Email

Aloha

Thank you for the opportunity to provide comments on the subject project.
Please see our standard comments at:

https://health.hawaii.gov/cab/files/2019/08/Standard-Comments-Clean-Air-Branch-2019.pdf

Please let me know if you have any questions.

Lisa M.M. Wallace
EHS QA Officer
Clean Air Branch
Environmental Health Office
Hilo, Hawaii 96720
(808) 933-0403

This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Standard Comments for Land Use Reviews
Clean Air Branch
Hawaii State Department of Health

If your proposed project:

Requires an Air Pollution Control Permit

You must obtain an air pollution control permit from the Clean Air Branch and comply with all applicable conditions and requirements. If you do not know if you need an air pollution control permit, please contact the Permitting Section of the Clean Air Branch.

Includes construction or demolition activities that involve asbestos

You must contact the Asbestos Abatement Office in the Indoor and Radiological Health Branch.

Has the potential to generate fugitive dust

You must control the generation of all airborne, visible fugitive dust. Note that construction activities that occur near to existing residences, business, public areas and major thoroughfares exacerbate potential dust concerns. It is recommended that a dust control management plan be developed which identifies and mitigates all activities that may generate airborne, visible fugitive dust. The plan, which does *not* require Department of Health approval, should help you recognize and minimize potential airborne, visible fugitive dust problems.

Construction activities must comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. In addition, for cases involving mixed land use, we strongly recommend that buffer zones be established, wherever possible, in order to alleviate potential nuisance complaints.

You should provide reasonable measures to control airborne, visible fugitive dust from the road areas and during the various phases of construction. These measures include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of airborne, visible fugitive dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing airborne, visible fugitive dust from shoulders and access roads;
e) Providing reasonable dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling airborne, visible fugitive dust from debris being hauled away from the project site.

If you have questions about fugitive dust, please contact the Enforcement Section of the Clean Air Branch

Clean Air Branch (808) 586-4200 cab@doh.hawaii.gov	Indoor Radiological Health Branch (808) 586-4700

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Alec Wong, P.E., Chief
Department of Health
Clean Water Branch
2827 Waimano Home Road
Hale Ola Building, Room 225
Pearl City, HI 96782-1487

Dear Mr. Wong:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Leo R. Asuncion Jr., AICP, Director
Department of Business, Economic Development and Tourism
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Asuncion Jr.:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Enclosure

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R. M. TOWILL CORPORATION
SINCE 1930

Planning
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Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Roderick Becker, Comptroller
Department of Accounting and General Services
Public Works Division
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Becker:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DAVID Y. IGE
GOVERNOR

CURT T. OTAGURO
COMPTROLLER

AUDREY HIDANO
DEPUTY COMPTROLLER

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

(F)20.194

NOV 20 2020

Brian Takeda, Planning Project Manager
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3470

Dear Mr. Takeda:

Subject: Hawaiian Humane Society (HHS) Hoopili Campus
Ewa Beach, Ewa District, Island of Oahu, Hawaii
Tax Map Key (TMK): (1) 9-1-181:042
Request for Pre-Assessment Consultation, Hawaii Revised Statutes (HRS), Chapter 343, and Hawaii Administrative Rules (HAR), Chapter 11-200.1

Thank you for the opportunity to provide comments for the subject project. The proposed project does not impact any of the Department of Accounting and General Services' existing facilities in the area, and we have no comments to offer at this time.

If you should have any questions, please call Dennis Chen of the Planning Branch at 586-0491.

Sincerely,

CHRISTINE L. KINIMAKA
Public Works Administrator

DC:mo

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Jade Butay, Director
Department of Transportation
Aliiaimoku Building
869 Punchbowl Street
Honolulu, HI 96813

Dear Mr. Butay:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
- Services available 7-days-a-week to support the needs of the community
- Adoption services and facilities
- Spay and neutering services
- Volunteer opportunities for youth and adults
- A dog park for the community

The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary

services will take place. The first floor will contain the animal admissions receiving area, temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

An adoptions lanai will be located on the first floor and consist of a sheltered, open-air space, that contains adoption information, a help desk, and a retail shop. A classroom on this floor will be provided for educational programming, youth camp, and field trips, orientation for new staff members and volunteers, public-animal related activities, and staff meetings. A volunteer check-in area on the first floor will be provided for volunteers to store belongings and check-in with staff and other volunteers. The first floor will also contain offices for staff, computer stations, storage rooms, maintenance rooms, supply rooms, a food preparation room, a grooming room, a laundry room, a reception area, and bathrooms. Patios and lanais will also be provided on the ground floor. The second floor will contain office space and a breakroom for HHS employees and volunteers.

South of the main building, the HHS Ho'opili campus will have six adoption pavilions, including three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, and an approximately 554 sf small animal pavilion. Two approximately 324 sf dog acquaintance areas for potential adopters to meet and greet dogs on a one on one basis will also be provided.

South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into the box culvert northeast of the project site. This swale will need to be enlarged to convey potential runoff from upstream properties. A detention basin is proposed near the north-eastern corner of the project site. The detention basin would be sized to capture runoff from the proposed development, conveying excess runoff to the nearby box culvert.

Access to the HHS Ho'opili Campus will be via an interim driveway constructed off of Old Fort Weaver Road along the northern side of the project site. An interim driveway will be used because this segment of the Old Fort Weaver Road will be removed and realigned as part of the Ho'opili Master Plan. The interim driveway and its future permanent replacement will be designed to comply with CCH regulations. Parking and loading areas along the north and west sides of the project site, connections to utilities, and landscaping consisting of grass, trees, and tropical foliage will also be installed at the project site.

Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new

Ho'opili campus will provide core services and accommodate the needs of approximately half the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

Similar to the HHS Mō'ili'ili campus, the HHS Ho'opili campus will be open for animal admissions, including lost and found services, daily from 7 am to 8 pm, with emergency services available 24/7. Adoption center hours will be Monday through Friday from 11 am to 7 pm, and Saturday and Sunday 10 am to 6 pm. The HHS Ho'opili campus will be closed most major holidays.

Minor construction-related traffic, noise, and air quality (dust) disturbances are anticipated. Construction equipment used for this project may include, but are not limited to: loaders, bulldozers, dump trucks, loader-backhoes, a trencher, grader, water trucks, concrete hauler pumpers, and flatbed trucks. The contractor will be required to observe and comply with all Federal, State, and local laws required for the protection of public health, safety, and the environment.

The contractor will prepare a Best Management Practices (BMPs) Plan for this project. The BMPs Plan will consist of erosion control measures such as planting or hydromulching grass seedling, erecting silt fencing/curtains, berms, and/or other applicable erosion control devices to prevent construction-related soils and silt from mixing with storm water runoff.

Upon the completion of work, areas surrounding the project site that have been affected by construction will be restored as much as practicable to pre-existing conditions. The following will be required:

- All construction-related debris, including excavated material, fill material, and refuse shall be removed from the project site and disposed of properly by the contractor.
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- Roadways providing access to the site shall be cleared of construction debris and any damage from construction traffic repaired.
- All areas damaged by construction staging shall be restored as much as practicable to preexisting conditions. Exposed ground areas shall be seeded or hydromulched as appropriate.

- Temporary utility lines will be removed from the site and all surplus excavation material and construction debris will be removed and disposed of off-site in compliance with applicable State and County regulations.

Construction of the HHS Ho'opili Campus is expected to commence in early 2021 with a duration of approximately 2 years. Construction activities are planned to take place during the daytime hours with no night work anticipated to be required.

Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

Please also be advised that you will be provided a 30-day public comment period following the publication of the Draft EA in the State Department of Health, Office of Environmental Quality Control's *The Environmental Notice*.

Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DAVID Y. IGE
GOVERNOR

JADE T. BUTAY
DIRECTOR

Deputy Directors
LYNN A.S. ARAKI-REGAN
DEREK J. CHOW
ROSS M. HIGASHI
EDWIN H. SNIFFEN

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

IN REPLY REFER TO:
DIR 1026
STP 8.3074

November 19, 2020

Mr. Brian Takeda
Planning Project Manager
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Mr. Takeda:

Subject: Pre-Assessment Consultation
Hawaiian Humane Society (HHS) Hoopili Campus
Ewa, Oahu, Hawaii
Tax Map Key: (1) 9-1-181: 042

The State of Hawaii, Department of Transportation (HDOT) has reviewed the subject pre-assessment consultation letter and understands HHS is proposing to construct a new Hoopili Campus on an approximately 5.473-acre parcel located to the southwest of the intersection of Old Fort Weaver Road (County jurisdiction) and Fort Weaver Road (State Route 65). The project will consist of an approximately 20,745 square foot (sf) two-story building, three approximately 1,629 sf dog pavilions, two approximately 825 sf cat pavilions, two approximately 324 sf dog acquaintance areas, a small animal pavilion, two gazebos, and an onsite detention basin. Parking and loading areas, as well as utility work will also be included.

HDOT also understands an interim access is being proposed on Old Fort Weaver Road. A future permanent access driveway will be designed and constructed to City and County of Honolulu standards once the Old Fort Weaver Road segment fronting the project site is realigned as part of the Hoopili Master Plan.

HDOT has the following comments:

Airports Division (HDOT-A)

1. The HHS Hoopili Campus is approximately 3.28 miles from the property boundary of Kalaeloa Airport (JRF). All projects within 5 miles from Hawaii State airports are advised to read the Technical Assistance Memorandum (TAM) for guidance with development and activities that may require further review and permits. The TAM can be viewed at this link: http://files.hawaii.gov/dbedt/op/docs/TAM-FAA-DOT-Airports_08-01-2016.pdf.

2. The HHS Hoopili Campus is approximately 19,694 feet from the end of Runway 22R at JRF. Federal Aviation Administration (FAA) regulation requires the submittal of FAA Form 7460-1 Notice of Proposed Construction or alteration pursuant to the Code of Federal Regulations, Title 14, Part 77.9, if the construction or alteration is within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet. Construction equipment and staging area heights, including

heights of temporary construction cranes, shall be included in the submittal. The form and criteria for submittal can be found at the following website: https://oeaaa.faa.gov/oeaaa/external/portal.jsp.

3. Due to the proximity to the airport, HHS should be aware of potential single event noise from aircraft operations. There is also a potential for fumes, smoke, vibrations, odors, etc., resulting from occasional aircraft flight operations over the project location.

4. Although the project is located outside of the 55 DNL (Day-Night Average Sound Level) noise contours on the 2008 Noise Exposure Map for the Daniel K. Inouye International Airport, and the 55 DNL noise contours on the 1998 Noise Exposure Map for JRF, HHS should be aware of the proximity of the airport flight paths and potential single event noise from aircraft operations.

5. Detention basins have the potential to attract wildlife to standing water. The HDOT-A is concerned about the potential of wildlife attracted to the proposed detention basin and recommends that HHS incorporates appropriate measures to address wildlife. Furthermore, the FAA recommends a distance of five miles between the closest point of the airport's aircraft operations area and the hazardous wildlife attractant.

   Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48-hour detention period after the design storm and to remain completely dry between storms. Please review the FAA Advisory Circular 150/5200-33C, Hazardous Wildlife Attractants On Or Near Airports for guidance.

   If the project results in a wildlife attractant, these effects shall be immediately mitigated by HHS upon notification by the HDOT-A and/or FAA.

Highways Division (HDOT-HWY)

1. HDOT-HWY provided comments on the subdivision application 2016/Sub-44 (July 20, 2016, HWY-PS 2.2781). In summary, we did not anticipate the subdivision or HHS use of the parcel would significantly impact State highways, subject to the following conditions that remain applicable:

   a. HSS coordinates with HDOT-HWY with respect to necessary permits and approvals for sidewalks and other improvements that would affect the State right-of-way (ROW).

   b. HSS provides a fence or appropriate barrier around their facility, in particular along the Fort Weaver Road frontage, to keep animals from entering the State highway.

2. No additional discharge of surface water run-off onto the State highway ROW is permitted. This includes the use of existing State drainage culverts and channels. All additional stormwater runoff from the project site shall be managed and mitigated onsite.

3. The Hoopili Master Plan required land use permits and approvals, including a Land Use District Boundary Amendment (Docket No. A06-771). The conditions attached to these approvals are typically transferred to new landowners. The Draft Environmental Assessment (EA) should include the following:

   a. A description of the difference between the Hoopili Master Plan proposed use of the site and the HHS proposed land use.

b. A summary of Hoopili Master Plan commitments that are applicable to the HHS land use. The property conveyance documents should describe the conditions applicable to HHS.

4. The Draft EA traffic impact discussion should include the following:

   a. Location of roadways, bike paths, sidewalks and bus stops in the vicinity.

   b. Location of existing and proposed (interim and permanent) site access driveways and roadway realignments.

   c. Best available information regarding existing (pre-Covid-19) traffic conditions in the vicinity of the site.

   d. Project description, including the use of new or existing infrastructure within the HDOT ROW; operations and construction activities; hours of operation; the estimated number of vehicle trips to/from the site during peak traffic hours; and the potential use of pedestrian and bicycle routes to access the site, especially the community dog park.

   e. An assessment of the project's potential direct, secondary and cumulative impacts to State roadways, sidewalks, and bike routes (level of service and safety).

   f. A discussion of the project's impact on the assumptions and findings of the most recent Hoopili Master Plan Traffic Impact Assessment Report (TIAR).

5. If the qualitative traffic assessment suggests a potential for adverse impact to State highways, include a TIAR prepared by a licensed Professional Engineer for HDOT review.

If there are any questions, please contact Mr. Blayne Nikaido of the HDOT Statewide Transportation Planning Office at (808) 831-7979 or via email at blayne.h.nikaido@hawaii.gov.

Sincerely,

JADE T. BUTAY
Director of Transportation

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

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Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Dr. Christina M. Kishimoto, Superintendent
Department of Education
1390 Miller Street
Honolulu, HI 96813

Dear Dr. Kishimoto:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

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the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DAVID Y. IGE
GOVERNOR

DR. CHRISTINA M. KISHIMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF FACILITIES AND OPERATIONS

November 23, 2020

Mr. Brian Takeda, Planning Project Manager
R.M. Towill Corporation
2014 North King Street, Suite 200
Honolulu, Hawaii 96819-3470

Re: Pre-Assessment Consultation for the Preparation of a Draft Environmental Assessment for the Hawaiian Humane Society Hoopili Campus
Ewa Beach, Oahu, Hawaii, TMK 9-1-181:042

Dear Mr. Takeda:

The Hawaii State Department of Education (HIDOE) has the following comments for the preparation of a Draft Environmental Assessment for the proposed Hawaii Humane Society Hoopili Campus of approximately 5.4 acres of land located at Ewa Beach, Island of Oahu, TMK 9-181:042.

The proposed action is not anticipated to impact HIDOE schools or facilities.

Thank you for the opportunity to comment. Should you have questions, please contact Robyn Loudermilk of the Facilities Development Branch, Planning Section, at 784-5093 or via email at robyn.loudermilk@k12.hi.us.

Respectfully,

for

Kenneth G. Masden II
Public Works Manager
Planning Section

KGM:rll

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
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Construction Management

November 9, 2020

Mr. Garett Kamemoto, HCDA Interim Executive Director
Hawai'i Community Development Authority
Department of Business, Economic Development & Tourism
547 Queen Street
Honolulu, HI 96813

Dear Mr. Kamemoto:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
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R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Ms. Jobie Masagatani, Chair
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, HI 96805

Dear Ms. Masagatani:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
- Services available 7-days-a-week to support the needs of the community
- Adoption services and facilities
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- A dog park for the community

The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area,

temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

An adoptions lanai will be located on the first floor and consist of a sheltered, open-air space, that contains adoption information, a help desk, and a retail shop. A classroom on this floor will be provided for educational programming, youth camp, and field trips, orientation for new staff members and volunteers, public-animal related activities, and staff meetings. A volunteer check-in area on the first floor will be provided for volunteers to store belongings and check-in with staff and other volunteers. The first floor will also contain offices for staff, computer stations, storage rooms, maintenance rooms, supply rooms, a food preparation room, a grooming room, a laundry room, a reception area, and bathrooms. Patios and lanais will also be provided on the ground floor. The second floor will contain office space and a breakroom for HHS employees and volunteers.

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South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into the box culvert northeast of the project site. This swale will need to be enlarged to convey potential runoff from upstream properties. A detention basin is proposed near the north-eastern corner of the project site. The detention basin would be sized to capture runoff from the proposed development, conveying excess runoff to the nearby box culvert.

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Sincerely,

Brian Takeda

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Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

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R. M. TOWILL CORPORATION
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Planning
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Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Ms. Kathy Sokugawa, Acting Director
Department of Planning & Permitting
650 South King Street
Honolulu, HI 96813

Dear Ms. Sokugawa:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

November 23, 2020

2020/ELOG-2238 (lli)
1948383

Mr. Brian Takeda
Planning Project Manager
R.M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3470

Dear Mr. Takeda:

SUBJECT: Hawaii Revised Statutes Chapter 343 Pre-Assessment Consultation
Hawaiian Humane Society, Hoopili Campus
Tax Map Key 9-1-181: 042
Ewa Beach, Oahu, Hawaii

Thank you for your letter dated November 9, 2020, notifying us of a proposed new campus for the Hawaiian Humane Society in Hoopili and the intent to prepare a Draft Environmental Assessment (EA).

We have reviewed the proposal and note that the Draft EA should include discussions on the proposed project's conformance with the following:

1. Objectives and policies of the General Plan;

2. Policies and guidelines of the Ewa Development Plan and how it will assist in fulfilling the long-term vision for the Ewa region;

3. Guidelines of the Hoopili Urban Design Plan, especially, but not limited to, building design, building siting, landscaping, and street trees. This discussion may have to include coordination with the developer's (D.R. Horton) plans to improve Old Fort Weaver Road and the extension of Keahumoa Parkway to Old Fort Weaver Road; and

4. Permitted uses and development standards of underlying zoning district.

The Draft EA should also include a discussion on the potential traffic impact to the roadways in the region, as well as bicycle and pedestrian access to the project site.

Should you have any questions, please contact Lisa Leonillo Imata at 768-8041 or lisa.imata@honolulu.gov, or Lin Wong at 768-8018 or lwong@honolulu.gov.

Very truly yours,

Eugene H. Takahashi
Deputy Director

EHT:tc

2024 North King Street
Suite 200
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R. M. TOWILL CORPORATION
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Planning
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Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Ms. Dina Wong, Manager
Department of Planning & Permitting
Planning Division
651 South King Street
Honolulu, HI 96814

Dear Ms. Wong:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
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Planning
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Construction Management

November 9, 2020

Mr. Mario Siu-Li, CFM, Floodplain Manager
Department of Planning & Permitting
City and County of Honolulu
650 South King Street 8th Floor
Honolulu, Hawaii 96813

Dear Mr. Siu-Li:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

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The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary

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South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

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Brian Takeda

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Planning Project Manager

Enclosure

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R. M. TOWILL CORPORATION
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Planning
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Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Lance Watanabe, Manager
Department of Planning and Permitting
Traffic Review Branch
650 South King Street 8th Floor
Honolulu, Hawaii 96813

Dear Mr. Watanabe:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
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R. M. TOWILL CORPORATION
SINCE 1930

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Surveying
Construction Management

November 9, 2020

Mr. Ross S. Sasamura, P.E., Director
Department of Facility Maintenance
1000 Uluohia Street, Suite 215
Kapolei, HI 96707

Dear Mr. Sasamura:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

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Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

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R. M. TOWILL CORPORATION
SINCE 1930

Planning
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November 9, 2020

Mr. Robert J. Kroning, P.E., Director
Department of Design and Construction
650 South King Street, 11rd Floor
Honolulu, HI 96813

Dear Mr. Kroning:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Access to the HHS Ho'opili Campus will be via an interim driveway constructed off of Old Fort Weaver Road along the northern side of the project site. An interim driveway will be used because this segment of the Old Fort Weaver Road will be removed and realigned as part of the Ho'opili Master Plan. The interim driveway and its future permanent replacement will be designed to comply with CCH regulations. Parking and loading areas along the north and west sides of the project site, connections to utilities, and landscaping consisting of grass, trees, and tropical foliage will also be installed at the project site.

Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new Ho'opili campus will provide core services and accommodate the needs of approximately half

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Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

Please also be advised that you will be provided a 30-day public comment period following the publication of the Draft EA in the State Department of Health, Office of Environmental Quality Control's *The Environmental Notice*.

Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

MARK YONAMINE, P.E.
DIRECTOR

HAKU MILLES, P.E.
DEPUTY DIRECTOR

December 16, 2020

R.M. Towill
ATTN: Brian Takeda
2024 North King Street Suite 200
Honolulu, Hawaii 96819-3470

Dear Mr. Takeda,

Subject: Hawaiian Humane Society Hoopili Campus, 'Ewa Beach, Hawaii
TMK: (1)9-1-181:042
Request for Pre-Assessment Consultation, Hawaii Revised Statutes Chapter 343, and Hawaii Administrative Rules, Chapter 11-200.1

Thank you for the opportunity to review and comment. The Department of Design and Construction does not have any comments at this time.

Should you have any further questions, please contact me at 768-8480.

Sincerely,

FOR Mark Yonamine, P.E.
Director

MY:ms(832522)

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
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Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Ernest Y. W. Lau, P.E., Manager
Honolulu Board of Water Supply
630 S. Beretania Street
Honolulu, HI 96843

Dear Mr. Lau:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

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The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area,

temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

December 7, 2020

KIRK CALDWELL, MAYOR

BRYAN P. ANDAYA, Chair
KAPUA SPROAT, Vice Chair
RAY C. SOON
MAX J. SWORD

ROSS S. SASAMURA, Ex-Officio
JADE T. BUTAY, Ex-Officio

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

ELLEN E. KITAMURA, P.E.
Deputy Manager and Chief Engineer

Mr. Brian Takeda
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Mr. Takeda:

Subject: Your Letter Dated November 9, 2020 Requesting Pre-Assessment Comments on the Draft Environmental Assessment of the Proposed Hawaii Humane Society Hoopili Campus Located Along Old Fort Weaver Road – Tax Map Key: 9-1-181: 042

Thank you for the opportunity to comment on the proposed Hoopili Hawaiian Humane Society.

The existing water system cannot provide adequate off-site fire protection to the proposed development. The Board of Water Supply (BWS) Water System Standards (WSS) require a fire hydrant spacing of 250 feet in the vicinity of the veterinarian/medical facilities and provide a flow of 2,000 gallons per minute (gpm). The nearest fire hydrant, Fire Hydrant No. L-00701, is approximately 300 linear feet away from the project site. Therefore, in accordance with our BWS WSS, the developer will be required to install fire hydrants with 250 foot spacing in the vicinity of the proposed project that can provide a flow of 2,000 gpm.

The construction drawings shall be submitted for our review and approval, and the construction schedule shall be coordinated with BWS to minimize impact on our water system.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

Water conservation measures are required for all proposed developments. These measures include utilization of nonpotable water for irrigation using rain catchment, drought tolerant plants, xeriscape landscaping, efficient irrigation systems, such as a drip system and moisture sensors, and the use of Water Sense labeled ultra-low flow water fixtures and toilets.

The BWS has a R-1 waterline running along the east boundary of the parcel, along Fort Weaver Road. The BWS will require a waterline easement to be granted in favor of the BWS. Any structures should be adequately set back from the waterline easements for the safety of the homeowners and public and to prevent damage to the structures in the event of main breaks, repair, and maintenance.

The BWS Rules and Regulations Section 1-112 requires nonpotable water for the irrigation of large landscaped areas. The proposed humane society development is adjacent to the BWS Recycled Water System. Thus, nonpotable water in the form of recycled water, which is designated R-1, must be used and the BWS agrees to provide R-1 recycled water to the development.

Connection to the BWS Recycled Water System is available along the east boundary of the parcel, along Fort Weaver Road.

In order to use recycled water, the user shall comply with Chapter 11-62, Hawaii Administrative Rules, Wastewater Systems. The user shall be required to prepare and submit to the Department of Health (DOH) Wastewater Branch a recycled water application form found in Appendix C of the DOH Volume 2 of the Reuse Guidelines dated January 2016. The user shall be responsible for any permitting, training, and on-site improvements, and any associated costs, as may be required by the DOH. The delivery of recycled water is contingent on the user obtaining DOH approval to use recycled water at the subject project and submitting a copy of the DOH approval to BWS. Once the application is reviewed and deemed satisfactory, the DOH will issue an approval to construct. The user must send the approval to construct letter to BWS before the plans can be approved.

The availability of recycled water will be confirmed when the Recycled Water Service Agreement (RWSA) between the BWS and the user is executed, and construction plans have been approved by the BWS. BWS reserves the right to change any position or information stated herein up until the execution of the RWSA and approval of the construction plans. When recycled water is made available the user shall be required to pay any applicable costs for its use.

A water meter will be required for recycled water service. Meter sizing and installation shall be coordinated with the BWS as described in the RWSA. If applicable, the user shall be responsible for obtaining the necessary easements, permits, and clearances and preparing any construction plans for the connection to the BWS recycled water system.

The BWS R-1 Effluent system utilizes a variable speed pumping system with no elevated storage reservoirs at this time. Therefore, pump running times and water pressures will vary depending on climate, water demand, and efficient pumping operation strategies and time of day. The Customer shall be placed on a time schedule, usually at night, and shall make reasonable accommodations to allow for a defined range of system pressures. A receiving tank and booster pump may be required to supply adequate pressures to the irrigation system; however, this should be verified with the BWS.

The proposed project is subject to BWS Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun, Project Review Branch of our Water Resources Division at 748-5443.

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

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Construction Management

November 9, 2020

Ms. Lori M. K. Kahikina, P.E., Director
Department of Environmental Services
1000 Uluohia Street, Suite 308
Kapolei, Hawaii 96707

Dear Ms. Kahikina:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

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2024 North King Street
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R. M. TOWILL CORPORATION
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Surveying
Construction Management

November 9, 2020

Ms. Michele K. Nekota, Director
Department of Parks and Recreation
1000 Ulu'ōhi'a Street, Suite 309
Kapolei, Hawai'i 96707

Dear Ms. Nekota:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

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Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new Ho'opili campus will provide core services and accommodate the needs of approximately half

the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

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Upon the completion of work, areas surrounding the project site that have been affected by construction will be restored as much as practicable to pre-existing conditions. The following will be required:

- All construction-related debris, including excavated material, fill material, and refuse shall be removed from the project site and disposed of properly by the contractor.
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- Temporary utility lines will be removed from the site and all surplus excavation material and construction debris will be removed and disposed of off-site in compliance with applicable State and County regulations.

Construction of the HHS Ho'opili Campus is expected to commence in early 2021 with a duration of approximately 2 years. Construction activities are planned to take place during the daytime hours with no night work anticipated to be required.

Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

Please also be advised that you will be provided a 30-day public comment period following the publication of the Draft EA in the State Department of Health, Office of Environmental Quality Control's *The Environmental Notice*.

Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

MICHELE K. NEKOTA
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

November 30, 2020

Mr. Brian Takeda
Planning Project Manager
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3470

Dear Mr. Takeda:

SUBJECT: Environmental Assessment, Pre-Assessment Consultation
Hawaiian Humane Society Hoopili Campus
Tax Map Key (1) 9-1-181:042

Thank you for the opportunity to review and comment at the Pre- Assessment consultation stage of the subject Environmental Assessment.

The Department of Parks and Recreation strongly supports this project as an important resource for the community and region.

Should you have any questions, please contact Mr. John Reid, Planner, at 768-3017.

Sincerely,

Michele K, Nekota
Director

MKN:jr
(832469)

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Ms. Sheri T. Kajiwara, Director
Department of Customer Services
550 South King Street
Honolulu, Hawai'i 96813

Dear Ms. Kajiwara:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Wes Frysztacki, Director
Department of Transportation Services
Frank F. Fasi Municipal Building
650 South King Street, Third Floor
Honolulu, Hawai'i 96813-3017

Dear Mr. Frysztacki:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • web: www.honolulu.gov

KIRK CALDWELL
MAYOR

JON Y. NOUCHI
ACTING DIRECTOR

DREANALEE KALILI
DEPUTY DIRECTOR

TP11/20-832607

November 23, 2020

Brian Takeda, Planning Project Manager
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Brian Takeda:

SUBJECT: Hawaiian Humane Society (HHS) Hoopili Campus
Ewa Beach, Ewa District, Island of Oahu, Hawaii
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawaii Administrative Rules (HAR), Chapter 11-200.1

Thank you for the opportunity to provide written comments regarding the subject project. We have the following comments.

1. **Transportation Impact Assessment (TIA).** The applicant should perform a TIA to examine the vehicle, pedestrian, bicycle, and public transit stress and comfort levels at the nearby intersections and driveways with corresponding improvements to mitigate these impacts by applying Complete Streets principles. The applicant shall discuss the future year growth rate, trip distribution, mode split, and route assignment assumptions used in the TIA. The applicant shall submit all native files (e.g., Synchro, Excel, etc.) for the raw multi-modal counts and accompanying analyses to the Regional Planning Branch at dtsplanningdiv@honolulu.gov. Please refer to the Department of Transportation Services (DTS) TIA Guide for multimodal assessment tools and recommended analyses. The TIA Guide can be found at http://www4.honolulu.gov/docushare/dsweb/View/Collection-7723.

2. **Street Usage Permit**. A street usage permit from the DTS should be obtained for any construction-related work that may require the temporary closure of any traffic lane or pedestrian mall on a City street.

3. **Neighborhood Impacts**. The area representatives, neighborhood board, as well as the area residents, businesses, emergency personnel (fire, ambulance, and police), Oahu Transit Services, Inc. (TheBus and TheHandi-Van), etc., should be kept apprised of the details and status throughout the project and the impacts that the project may have on the adjoining local street area network.

4. **Bus Stops**. The project site is in the immediate vicinity of bus stops. Submit project plans to DTS – Transportation Mobility Division (TMD) for review and approval. Contact DTS-TMD at TheBusStop@honolulu.gov.

5. **Disability and Communication Access Board (DCAB)**. Project plans (vehicular and pedestrian circulation, sidewalks, parking and pedestrian pathways, vehicular ingress/egress, etc.) should be reviewed and approved by DCAB to ensure full compliance with Americans with Disabilities Act (ADA) requirements.

Thank you for the opportunity to review this matter. Should you have any questions, please contact Mike Motoki, of my staff, at 768-6684.

Very truly yours,

Jon Y. Nouchi
Acting Director

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
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Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Kirk Caldwell, Mayor
Office of the Mayor
530 South King Street, Room 300
Honolulu, Hawaii 96813

Dear Mr. Caldwell:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
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Similar to the HHS Mō'ili'ili campus, the HHS Ho'opili campus will be open for animal admissions, including lost and found services, daily from 7 am to 8 pm, with emergency services available 24/7. Adoption center hours will be Monday through Friday from 11 am to 7 pm, and Saturday and Sunday 10 am to 6 pm. The HHS Ho'opili campus will be closed most major holidays.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Jim Howe, Director
Emergency Services Department
3375 Koapaka Street, Suite H450
Honolulu, Hawaii 96819

Dear Mr. Howe:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

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- Services available 7-days-a-week to support the needs of the community
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The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area,

temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

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Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
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R. M. TOWILL CORPORATION
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Planning
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Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Ms. Susan Ballard, Chief of Police
Honolulu Police Department
801 South Beretania Street
Honolulu, Hawaii, 96813

Dear Ms. Ballard:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

KIRK CALDWELL
MAYOR

SUSAN BALLARD
CHIEF

JOHN D. McCARTHY
CLYDE K. HO
DEPUTY CHIEFS

OUR REFERENCE EO-DK

November 18, 2020

Mr. Brian Takeda
Planning Project Manager
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3470

Dear Mr. Takeda:

This is in response to your letter of November 9, 2020, requesting input on the Pre-Assessment Consultation, Environmental Assessment, for the proposed Hawaiian Humane Society Hoopili Campus project in Ewa Beach.

Based on the information provided, the Honolulu Police Department (HPD) does not have any comments or concerns at this time. However, the HPD would like to be notified of any updates to the project to reassess its impact on police operations.

If there are any questions, please call Major Craig Uehira of District 8 (Kapolei, Waianae) at 723-8400.

Thank you for the opportunity to review this project.

Sincerely,

RADE K. VANIC
Assistant Chief of Police
Support Services Bureau

Serving and Protecting With Aloha

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Manuel P. Neves, Fire Chief
Honolulu Fire Department
636 South Street
Honolulu, HI 96813

Dear Mr. Neves:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

KIRK CALDWELL
MAYOR

MANUEL P. NEVES
FIRE CHIEF

LIONEL CAMARA JR.
DEPUTY FIRE CHIEF

November 18, 2020

Mr. Brian Takeda
Planning Project Manager
R. M. Towill Corporation
2024 North King Street, Suite 200
Honolulu, Hawaii 96819-3470

Dear Mr. Takeda,

Subject: Preassessment Consultation
Hawaiian Humane Society Hoopili Campus
Ewa Beach, Hawaii
Tax Map Key: 9-1-181: 042

In response to your letter dated November 9, 2020, regarding the abovementioned subject, the Honolulu Fire Department (HFD) reviewed the submitted information and requires that the following be complied with:

1. Fire department access roads shall be provided such that any portion of the facility or any portion of an exterior wall of the first story of the building is located not more than 150 feet (45 meters) from fire department access roads as measured by an approved route around the exterior of the building or facility. (National Fire Protection Association [NFPA] 1; 2012 Edition, Sections 18.2.3.2.2 and 18.2.3.2.2.1.)

   A fire department access road shall extend to within 50 feet (15 meters) of at least one exterior door that can be opened from the outside and that provides access to the interior of the building. (NFPA 1; 2012 Edition, Section 18.2.3.2.1.)

2. A water supply approved by the county, capable of supplying the required fire flow for fire protection, shall be provided to all premises upon which facilities or buildings, or portions thereof, are hereafter

constructed, or moved into or within the county. When any portion of the facility or building is in excess of 150 feet (45,720 millimeters) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains capable of supplying the required fire flow shall be provided when required by the AHJ [Authority Having Jurisdiction]. (NFPA 1; 2012 Edition, Section 18.3.1, as amended.)

3. The unobstructed width and unobstructed vertical clearance of a fire apparatus access road shall meet county requirements. (NFPA 1; 2012 Edition, Sections 18.2.3.4.1.1 and 18.2.3.4.1.2, as amended.)

4. Submit civil drawings to the HFD for review and approval.

Should you have questions, please contact Acting Battalion Chief Douglas Bennett of our Fire Prevention Bureau at 723-7155 or dbennett@honolulu.gov.

Sincerely,

JASON SAMALA
Assistant Chief

JS/TC:bh

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Brian Schatz, U.S. Senator
U.S. Senator
300 Ala Moana Blvd., Rm 7-212
Honolulu, HI 96850

Dear Mr. Schatz:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

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The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area,

temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

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South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into the box culvert northeast of the project site. This swale will need to be enlarged to convey potential runoff from upstream properties. A detention basin is proposed near the north-eastern corner of the project site. The detention basin would be sized to capture runoff from the proposed development, conveying excess runoff to the nearby box culvert.

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Sincerely,

Brian Takeda

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Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

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R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Ms. Mazie Hirono, U.S. Senator
U.S. Senator
300 Ala Moana Blvd. Rm. 3-106
Honolulu, HI 96850

Dear Ms. Hirono:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

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2024 North King Street
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R. M. TOWILL CORPORATION
SINCE 1930

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Surveying
Construction Management

November 9, 2020

Mr. Mike Gabbard, Senator
State Senatorial District 20
415 S Beretania Street, Suite 201
Honolulu, HI 96813

Dear Mr. Gabbard:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

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SINCE 1930

Planning
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November 9, 2020

Mr. Rob McDermott, Representative
Representative District 40
415 S Beretania Street, Suite 330
Honolulu, HI 96813

Dear Mr. McDermott:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

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The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area,

temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

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South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into the box culvert northeast of the project site. This swale will need to be enlarged to convey potential runoff from upstream properties. A detention basin is proposed near the north-eastern corner of the project site. The detention basin would be sized to capture runoff from the proposed development, conveying excess runoff to the nearby box culvert.

Access to the HHS Ho'opili Campus will be via an interim driveway constructed off of Old Fort Weaver Road along the northern side of the project site. An interim driveway will be used because this segment of the Old Fort Weaver Road will be removed and realigned as part of the Ho'opili Master Plan. The interim driveway and its future permanent replacement will be designed to comply with CCH regulations. Parking and loading areas along the north and west sides of the project site, connections to utilities, and landscaping consisting of grass, trees, and tropical foliage will also be installed at the project site.

Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new Ho'opili campus will provide core services and accommodate the needs of approximately half

the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

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Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Ron Menor, Councilmember
City Council District 9
City Council Office, Honolulu Hale, Room 203
Honolulu, HI 96813

Dear Mr. Menor:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

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the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

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Sincerely,

Brian Takeda

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Enclosure

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R. M. TOWILL CORPORATION
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Planning
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November 9, 2020

Mr. Alan Oshima, CEO
Hawaiian Electric Company, Inc.
820 Ward Avenue
Honolulu, HI 96814

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Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
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Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

From: R M Towill Corporation
To: Brian Takeda
Subject: Fw: RM Towill Pre-Assessment Consultation - Hawaiian Humane Society Ho"opili Campus
Date: Friday, December 18, 2020 6:35:01 AM

From: Liu, Rouen <rouen.liu@hawaiianelectric.com>
Sent: Thursday, December 17, 2020 3:49 PM
To: rmtowill@hawaii.rr.com <rmtowill@hawaii.rr.com>
Cc: Kuwaye, Kristen <kristen.kuwaye@hawaiianelectric.com>
Subject: RM Towill Pre-Assessment Consultation - Hawaiian Humane Society Ho'opili Campus

CAUTION: External Email

Dear Mr. Takeda

Thank you for the opportunity to comment on the subject project. Hawaiian Electric Company has no objection to the project. Hawaiian Electric has existing easements and facilities on the subject property, we will need continued access for maintenance of our facilities. Please show the existing electrical facilities on your design plans. We appreciate your efforts to keep us apprised of the subject project in the planning process. As the proposed Hawaiian Humane Society Ho'opili Campus project comes to fruition, please continue to keep us informed.

Should there be any questions, welcome to contact me at 543-7245

Rouen Liu
Permit Engineer
Hawaiian Electric Company

CONFIDENTIALITY NOTICE: This e-mail message, including any attachments, is for the sole use of the intended recipient(s) and may contain confidential and/or privileged information. Any unauthorized review, use, copying, disclosure or distribution is prohibited. If you are not the intended recipient, please contact the sender immediately by reply e-mail and destroy the original message and all copies.

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2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
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R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

November 9, 2020

Mr. Mitchell Tynanes, Chair
Ewa Neighborhood Board No. 23
91-3074 Makalea Loop
Ewa Beach, HI 96706

Dear Mr. Tynanes:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
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Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new Ho'opili campus will provide core services and accommodate the needs of approximately half

the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@hawaii.rr.com

R. M. TOWILL CORPORATION
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November 9, 2020

Ms. Kiersten Faulkner
Historic Hawaii Foundation
680 Iwilei Road, Suite 690
Honolulu, HI 96817

Dear Ms. Faulkner:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

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Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
Fax 808 842 1937
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November 9, 2020

Mr. Donald R. Horton, Chairman of the Board
D. R. Horton
130 Merchant Street
Suite 112
Honolulu, HI 96813

Dear Mr. Horton:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
Honolulu Hawaii 96819-3470
Telephone 808 842 1133
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R. M. TOWILL CORPORATION
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November 9, 2020

Ms. Mailani Barnett, Site Manager
West Loch Fairways Association
c/o Hawaiiana Management Company
Pacific Park Plaza
711 Kapiolani Blvd., Suite 700
Honolulu, HI 96813

Dear Ms. Barnett:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

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Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society

2024 North King Street
Suite 200
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R. M. TOWILL CORPORATION
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Surveying
Construction Management

November 9, 2020

Ms. Karen Tan, LCSW, President & CEO
Child and Family Services
91-1841 Fort Weaver Road
Ewa Beach, HI 96706

Dear Ms. Tan:

Subject: Hawaiian Humane Society (HHS) Ho'opili Campus
'Ewa Beach, 'Ewa District, Island of O'ahu, Hawai'i
Tax Map Key (TMK): (1) 9-1-181: 042
Request for Pre-Assessment Consultation, Hawai'i Revised Statutes (HRS), Chapter 343, and Hawai'i Administrative Rules (HAR), Chapter 11-200.1

On behalf of the HHS, we are providing public notification that an Environmental Assessment (EA) in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1, is under preparation for the planned establishment of a new HHS Ho'opili Campus. The specific action that requires the preparation of the EA includes the use of state or county funds for construction.

The Ho'opili campus will be constructed on an approximately 5.473-acre parcel (TMK (1) 9-1-181: 042) within the Ho'opili master-planned community in 'Ewa Beach, O'ahu, Hawai'i (**Figure 1, Project Location**). The campus layout is shown on **Figure 2, Proposed HHS Ho'opili Campus Location, Figure 3, Proposed HHS Ho'opili Campus,** and **Figure 4, HHS Ho'opili Site Plan.** The new campus is planned to be an important resource for the community and region, and when constructed will provide:

- A "new generation" shelter designed to optimize the behavioral, medical, and socialization needs of the animals and the people who visit them, and for ease of cleaning, maintenance, and disease control
- Services available 7-days-a-week to support the needs of the community
- Adoption services and facilities
- Spay and neutering services
- Volunteer opportunities for youth and adults
- A dog park for the community

The new campus will include an approximately 20,745 square feet (sf) two-story building on the northern portion of the project site where administrative, programmatic, adoption, and veterinary services will take place. The first floor will contain the animal admissions receiving area,

temporary holding rooms, examination rooms, treatment rooms, surgery rooms, recovery rooms, cat holding rooms for the separation of feral, friendly and sick cats, and kittens, individual dog wards, dog holding runs, dog/cat kennels, and an area dedicated to our foster program. Veterinary services will include a range of procedures not limited to, vaccinations, health examinations, implantation of microchips, dental procedures, minor to major surgical procedures, and spay and neutering of animals prior to adoption.

An adoptions lanai will be located on the first floor and consist of a sheltered, open-air space, that contains adoption information, a help desk, and a retail shop. A classroom on this floor will be provided for educational programming, youth camp, and field trips, orientation for new staff members and volunteers, public-animal related activities, and staff meetings. A volunteer check-in area on the first floor will be provided for volunteers to store belongings and check-in with staff and other volunteers. The first floor will also contain offices for staff, computer stations, storage rooms, maintenance rooms, supply rooms, a food preparation room, a grooming room, a laundry room, a reception area, and bathrooms. Patios and lanais will also be provided on the ground floor. The second floor will contain office space and a breakroom for HHS employees and volunteers.

South of the main building, the HHS Ho'opili campus will have six adoption pavilions, including three approximately 1,620 sf dog pavilions, two approximately 825 sf cat pavilions, and an approximately 554 sf small animal pavilion. Two approximately 324 sf dog acquaintance areas for potential adopters to meet and greet dogs on a one on one basis will also be provided.

South of the adoption pavilions and acquaintance areas, a spacious dog park will be provided for use by HHS and the public for dogs to walk, run, play, and socialize. Two approximately 156 sf gazebos will be located on either side of the dog park to provide shade and comfort.

Along the east side of the project site, there is an existing swale that runs along Fort Weaver Road that discharges into the box culvert northeast of the project site. This swale will need to be enlarged to convey potential runoff from upstream properties. A detention basin is proposed near the north-eastern corner of the project site. The detention basin would be sized to capture runoff from the proposed development, conveying excess runoff to the nearby box culvert.

Access to the HHS Ho'opili Campus will be via an interim driveway constructed off of Old Fort Weaver Road along the northern side of the project site. An interim driveway will be used because this segment of the Old Fort Weaver Road will be removed and realigned as part of the Ho'opili Master Plan. The interim driveway and its future permanent replacement will be designed to comply with CCH regulations. Parking and loading areas along the north and west sides of the project site, connections to utilities, and landscaping consisting of grass, trees, and tropical foliage will also be installed at the project site.

Overall, the development of the new HHS Ho'opili campus will help to meet the growing demand for HHS services on O'ahu and in the growing 'Ewa region. Once constructed, the new Ho'opili campus will provide core services and accommodate the needs of approximately half

the population of O'ahu. The thoughtful and pro-active design of the HHS facilities will not only result in healthier, happier animals but lower operational costs while improving the quality of life for every animal under the HHS's care. The proposed facility is expected to welcome upwards of 10,000 animals each year and will work in concert with the existing HHS Mō'ili'ili campus where the administrative functions will continue to be housed.

Similar to the HHS Mō'ili'ili campus, the HHS Ho'opili campus will be open for animal admissions, including lost and found services, daily from 7 am to 8 pm, with emergency services available 24/7. Adoption center hours will be Monday through Friday from 11 am to 7 pm, and Saturday and Sunday 10 am to 6 pm. The HHS Ho'opili campus will be closed most major holidays.

Minor construction-related traffic, noise, and air quality (dust) disturbances are anticipated. Construction equipment used for this project may include, but are not limited to: loaders, bulldozers, dump trucks, loader-backhoes, a trencher, grader, water trucks, concrete hauler pumpers, and flatbed trucks. The contractor will be required to observe and comply with all Federal, State, and local laws required for the protection of public health, safety, and the environment.

The contractor will prepare a Best Management Practices (BMPs) Plan for this project. The BMPs Plan will consist of erosion control measures such as planting or hydromulching grass seedling, erecting silt fencing/curtains, berms, and/or other applicable erosion control devices to prevent construction-related soils and silt from mixing with storm water runoff.

Upon the completion of work, areas surrounding the project site that have been affected by construction will be restored as much as practicable to pre-existing conditions. The following will be required:

- All construction-related debris, including excavated material, fill material, and refuse shall be removed from the project site and disposed of properly by the contractor.
- All construction equipment shall be removed from the project site promptly after construction is complete.
- Any temporary modification to existing utilities, such as power or communications lines, shall be repaired to their pre-existing condition.
- Roadways providing access to the site shall be cleared of construction debris and any damage from construction traffic repaired.
- All areas damaged by construction staging shall be restored as much as practicable to preexisting conditions. Exposed ground areas shall be seeded or hydromulched as appropriate.
- Temporary utility lines will be removed from the site and all surplus excavation material and construction debris will be removed and disposed of off-site in compliance with applicable State and County regulations.

Construction of the HHS Ho'opili Campus is expected to commence in early 2021 with a duration of approximately 2 years. Construction activities are planned to take place during the daytime hours with no night work anticipated to be required.

Thank you for your participation in the pre-assessment consultation for this project. Should you have any concerns or issues that you feel should be addressed with the publication of the Draft EA for this project, please submit your written comments to the undersigned by U. S Postal Service, to R. M. Towill Corporation, 2024 North King Street, Suite 200, Honolulu, Hawaii, 96819.

Please ensure that your comments are received or postmarked by **Monday, November 23, 2020**. All relevant concerns shall be considered in accordance with HRS, Chapter 343, and HAR, Chapter 11-200.1.

Please also be advised that you will be provided a 30-day public comment period following the publication of the Draft EA in the State Department of Health, Office of Environmental Quality Control's *The Environmental Notice*.

Should you have any questions please contact the undersigned at (808) 842-1133. Thank you for your assistance.

Sincerely,

Brian Takeda

Brian Takeda,
Planning Project Manager

Enclosure

cc: Anna Neubauer, President and CEO Hawaiian Humane Society