Kamehameha Schools
Kāpaeloa Cultural Learning Project
Kawaiiloa Ahupua’a, Waialua District, O’ahu, Hawai‘i
TMK (1) 6-1-003: por. 56

Draft Environmental Assessment and Application for Special Management Area Use Permit

Applicant:
Kamehameha Schools

Approving Agency:
City and County of Honolulu
Department of Planning and Permitting

Prepared by:

GROUP 70 INTERNATIONAL
Sustainable Development • Architecture • Planning & Environmental Services • Civil Engineering
Interior Design • Technology

July 2011
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This environmental document is prepared pursuant to Chapter 200 of Title 11, Administrative Rules,

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Sustainable Development • Architecture • Planning & Environmental Services • Civil Engineering
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E. Archaeological Inventory Survey for an Approximately 3.5-Acre Project Area, Kawaiola Ahupua‘a, Waialua District, O‘ahu. (Cultural Surveys Hawai‘i, Inc., May 2011).

F. Cultural Impact Assessment for the Kamehameha Schools Kapaeloa Cultural Learning Project, Kawaiola (Kapaeloa) Ahupua‘a, Waialua District, O‘ahu. (Cultural Surveys, Hawai‘i, Inc. May 2011).
1.0 INTRODUCTION
1.0 INTRODUCTION

1.1 PROJECT INFORMATION SUMMARY

Type of Application: Environmental Assessment
Special Management Area Use Permit (SMA)

Project Name: Kamehameha Schools Kāpaeloa Cultural Learning Project

EA Trigger: Project located in SMA

Applicant / Recorded Fee Owner: Trustees of the Estate of Bernice Pauahi Bishop
Kamehameha Schools
567 South King Street
Honolulu, Hawaii 96813
Contact Person: Kalani Fronda, Senior Land Asset Manager
Endowment Group, Land Assets Division
Telephone: 808-523-6244

Planning Consultant: Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813
Contact Person: Jeff Overton
Telephone: 808-523-5866 x104
Email: KapaeloaEA@group70int.com

Approving Agency: Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Project Location: 61-149 Kamehameha Highway
Kawailoa Ahupua’a, Waialua District, Island of O’ahu
(Figure 1-1)

Tax Map Key: (1) 6-1-003: por. 56

Landowner: Trustees of the Estate of Bernice Pauahi Bishop dba
Kamehameha Schools

Project Area: 151,924 square feet (SF) or 3.48 acres (ac.)

Existing Zoning (LUO): R-5, Residential District

Existing Use: Property is primarily vacant. The property was previously
leased for recreational use.
Proposed Use: Kamehameha Schools Kāpaeloa Cultural Learning Project will include an outdoor activity lawn, an educational pavilion, dormitory structures, two caretaker’s residences, an educational native plant garden, off-street parking, and support infrastructure. The primary use will be a school facility for school-aged children (grades K-12) participating in Kamehameha Schools programs.

State Land Use District: Urban (Figure 1-2)

Sustainable Communities Plan (SCP): North Shore

SCP Land Use Designation: Rural Residential

SCP Public Facilities Map Designation: None

Special Management Area: Yes (Figure 1-3)

Flood Zone Designation: Firm Zone D and VE

Historic Register: No

Required Applications/Approvals: Environmental Assessment (EA) Special Management Area (SMA) Use Permit Conditional Use Permit (CUP minor) for School Use

1.2 OVERVIEW OF PROPOSED PROJECT

The proposed Kāpaeloa Cultural Learning Project will include development of the existing vacant property owned by the Trustees of the Estate of Bernice Pauahi Bishop doing business as (dba) Kamehameha Schools (KS). The proposed project will consist of the following: an outdoor activity lawn, an educational pavilion, dormitory structures, two caretaker’s residences, an educational native plant garden, off-street parking, and support infrastructure. The primary use of the project will be school facility for school-aged children (grades K-12) participating in Kamehameha Schools programs.

The project site is located at 61-149 Kamehameha Highway, Waialua District, Island of O‘ahu. The property is bordered by the ‘Ili‘ohu subdivision, Kamehameha Highway, an open space beach access area, and the ocean.

The project site is approximately 3.48 ac., and was previously leased for recreational uses, and is currently zoned Residential District (R-5), under the City and County of Honolulu Land Use Ordinance (LUO). The project is located within the County Special Management Area (SMA). An Environmental Assessment (EA) is being prepared and will be submitted to supplement the application for the Special Management Area Use Permit (SMP).
The proposed Kāpaeloa Cultural Learning Project will support the KS North Shore regional plan and projects including Loko Ea fishpond, Uko’a marsh, and Kupopolo Heiau. The proposed facilities will serve as an educational venue for Kamehameha Schools educational programs.

A portion of the property was condemned by the City and County of Honolulu to establish a small area for passive park (as and addition to the Kawailoa Beach Park) under the City Council Condemnation Resolution 94-273. The surveyed parcel is in the process of being subdivided into two lots. The resolution lists the Kawailoa Beach Park parcel as TMK: 6-1-003:027 (por.) and provides a parcel map and legal description. However, the conveyance documents for Resolution 94-273 have not yet been completed. Therefore, the property boundaries and resulting TMKs have not been assigned. For this report, it is assumed that the remainder of TMK: 6-1-003:027, which consist of 151,924 SF, is the project boundary. TMK (1) 6-1-003: por. 56 will be used for application purposes for the proposed project.

1.3 CONTENT OF ENVIRONMENTAL ASSESSMENT

This report serves dual functions of an Environmental Assessment (EA) and Special Management Area Use Permit (SMA Use Permit or SMP) application for the proposed Kamehameha Schools Kāpaeloa Cultural Learning Project. It has been prepared in accordance with the provisions of the Revised Ordinances of Honolulu (ROH) Chapter 25, Special Management Area, and the “Content Guide for Preparing an EA required with a SMP Application” (City Department of Planning and Permitting (DPP)). The contents of the EA and processing will comply with the requirements set forth in Chapter 343 Hawaii Revised Statutes (HRS), and in the State of Hawaii Administrative Rules, Title 11, Department of Health.

This EA report is presented in eight sections. General information on the Kamehameha Schools Kāpaeloa Cultural Learning Project is summarized in this section. Section 2 presents a detailed description of the project which includes site characteristics, proposed construction, anticipated levels of use and occupancy, estimated project costs, anticipated construction schedules, and required land use approvals. Section 3 describes the environment setting, potential impacts and mitigation measures. Description and an analysis of alternatives are provided in Section 4. Section 5 relates the project to existing State and City and County of Honolulu (City) plans and policies, including the State of Hawaii Coastal Zone Management (CZM) Program. The anticipated determination of no significant impact and reasons in support of this finding are given in Section 6. Section 7 lists the agencies, and organizations that were consulted in connection with the preparation and/or received copies of the Draft EA. A list of references is provided in Section 8.
1.4 CONSULTED AGENCIES, ORGANIZATIONS AND INDIVIDUALS

As part of the pre-consultation process, small informal meetings were held with members of the North Shore community who have been involved with the planning of the Kamehameha Schools North Shore Regional Plan. In addition, the following government agencies, elected officials, and community organizations were contacted as part of the EA pre-assessment consultation process:

State of Hawai‘i Agencies and Elected Officials

- State Senator, District No. 22
- State Representative, District No. 46
- Department of Business, Economic Development & Tourism – Planning Office
- Department of Health- Environmental Planning Office
- Department of Land and Natural Resources
- DLNR, Historic Preservation Division
- Department of Transportation
- Office of Environmental Quality Control
- Office of Hawaiian Affairs

City and County of Honolulu Agencies and Elected Officials

- Mayor’s Office
- Councilmember, District No. 2
- Board of Water Supply
- Department of Community Services
- Department of Design and Construction
- Department of Environmental Services
- Department of Facility Maintenance
- Department of Planning and Permitting
- Department of Parks and Recreation
- Department of Transportation Services
- Fire Department
- Police Department

Federal Agencies

- US Fish and Wildlife Service
- US Army Corps of Engineers

Community Groups and Associations

- North Shore Neighborhood Board No. 27
- Betty Jenkins
- Thomas Shirai
- Janell Chun Silva
- Gladys Awai-Lennox
- Emmaline Plemer Causey
- Marlene Keao Abrigo
(Source: USGS, 2005)

**PROJECT LOCATION**
KÄPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

**FIGURE 1-1**
STATE LAND USE DISTRICT
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

FIGURE 1-2
SPECIAL MANAGEMENT AREA
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

(Source: City and County of Honolulu, Dept. of Planning and Permitting GIS)
2.0 DESCRIPTION OF THE PROPOSED ACTION

'O Waialua, kai lelo nui,
Ua lono ka uka o Lihuë
Ke wâ la Wahiawâ e,
Kuli wale, kuli wale i ka leo,
He leo no ke kai e

Waialua, place where the sea is loud,
Heard in the uplands of Lihu‘e
The voice that reaches Wahiawâ,
A voice that is deafening to the ears,
The voice of the ocean

Chanted by Hi‘iakaikapioiolepe during her arduous journey through the Ko‘olau, these words capture the essence of Waialua’s most prominent natural force, the resound of the pounding surf, understood in Hawaiian culture as the spiritual presence and voice of the ancestors.

2.1 PURPOSE AND NEED FOR PROPOSED PROJECT

Kamehameha Schools (KS) was founded in 1887 by the will of Bernice Pauahi Bishop, great-granddaughter and last royal descendent of Kamehameha the Great. The mission of KS is to fulfill Pauahi’s desire to educational opportunities in perpetuity to improve the capability and well being of people of Hawaiian ancestry.

On the North Shore of O‘ahu, KS owns and has kuleana of 26,200 ac. of land that was bequeathed to KS by Bernice Pauahi Bishop. KS’ North Shore properties are located within the moku o Waialua which stretches from Ka‘ena Point to Kapaeloa (just before Waimea). These lands present a tremendous opportunity for honoring her legacy, and the legacy of other ali‘i who graced these lands, by choosing and utilizing sustainable methods of land management grounded in a Hawaiian worldview.

The Kamehameha Schools (KS) is proposing a Cultural Learning Project at the Kapaeloa makai parcel, also known as Kapaeloa Kai. Educational programs at the project will be associated with KS North Shore Plan projects including the cultural landscape restoration of Kupopolo Heiau, the stewardship of Loko Ea fishpond, and restoration of Uko‘a marsh archaeological sites. Kapaeloa Kai was chosen, in part, due to its proximity to the Kupopolo Heiau. Development on the makai parcel will minimize potential impacts on the mauka parcel where Kupopolo Heiau is located.

The proposed project will also fulfill KS Land Assets Division (LAD)’s 2010-2011 Strategic Plan Goal #6 - Practice ethical, prudent and cultural appropriate stewardship of lands and resources. Key criteria for culturally-appropriate stewardship, according to LAD Strategic Plan Goal #6 include:

- Mo‘okūauhau: Forge and foster kinship with lands and resources
- Kuleana: Fulfill responsibility to care for lands and resource
• **Mana**: Improve capabilities and well-being through fulfilling responsibilities of our relationship to lands and resources

In summary, the Kāpaeloa Cultural Learning Project will educate students in the following program areas:

1) Bolster KS’s mission on natural and cultural resources management by educating youth about culturally appropriate stewardship of natural resources, ecosystems, and cultural landscapes
2) Foster kinship with land and resources, fulfill **kuleana** of stewardship, and build community leadership capacity through education
3) Provide sustainability lessons in support of the KS North Shore Plan projects
4) Support KS archaeology youth field school
5) Care for the cultural resources of Kupopolo Heiau
6) Reintegrate traditional places and names of Kāpaeloa Ahupua’a
7) Demonstrate **mauka** to **makai** approach of land stewardship by providing agricultural training for the agricultural resources **mauka** of the site through the educational native plant garden and providing marine-based educational programs for the coastal resources

### 2.2 PROJECT LOCATION AND CHARACTERISTICS

#### 2.2.1 Location, Ownership and Legal Land Description

The project site is located at 61-149 Kamehameha Highway, Kāpaeloa, near Waimea Bay, in Kawaiola Ahupua’a, Waialua District, on the Island of O’ahu.

The project site is owned by the Trustees of the Estate of Bernice Pauahi Bishop, doing business as Kamehameha Schools.

The parcel is currently listed as Tax Map Key (1) 6-1-003:56, consisting of 203,497 SF or approximately 4.672 ac. See Figure 2-1.

A portion of the property was condemned by the City and County of Honolulu to establish a small area for passive park under the City Council Condemnation Resolution 94-273. The parcel is in the process of being subdivided into two lots. The resolution lists the Kawaiola Beach Park parcel as TMK: 6-1-03:27 (por.) and provides a parcel map and legal description.

The conveyance documents for Resolution 94-273 have not yet been completed. Therefore, the property boundaries and resulting TMKs have not been assigned.

For application purposes, TMK (1) 6-1-003: por. 56 consisting of 151,924 SF or approximately 3.48 ac., will be used for the proposed project.
TAX MAP KEY
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

(Source: City and County of Honolulu, Dept. of Planning and Permitting GIS)
2.2.2 Surrounding and Existing On-Site Land Uses

Land uses adjacent to the project site include Kamehameha Highway, a vacant parcel, the ocean, and a residential subdivision along ‘Ili‘ohu Place to the north.

The parcel was previously leased for recreational use with a single level beach cottage. The lease has since been terminated and the cottage was removed. The project site is currently vacant. A majority of the property is overgrown with vegetation. A portion of the property adjacent to the lots in the ‘Ili‘ohu subdivision has been landscaped, and is used unofficially by the neighbors.

2.3 DESCRIPTION OF PROPOSED PROJECT

The Kamehameha Schools Kāpae’loa Cultural Learning Project will include an outdoor activity lawn, an educational pavilion, dormitory structures, two caretaker’s residences, an educational native plant garden, off-street parking, and support infrastructure. The primary use of the project will be a school facility for school-aged children (grades K-12) participating in Kamehameha Schools programs. Details of the educational program for the Kāpae’loa Cultural Learning Project are still being refined. For planning purposes, the preliminary program is presented in this report.

The Kāpae’loa Cultural Learning Project will be used by KS program students year-round but most actively during the school year. Students will engage in multi-day educational program activities. Each program will have approximately 70 participants including students, advisors, and faculty members. The groups will conduct learning sessions lasting up to one week. The programming will make use of the full-day cycle, including nighttime sky studies, sunrise, and sunset. The largest events may have up to approximately 100 people per week during intercession periods. The facility may be utilized by students from other private and public schools affiliated with the KS educational programs, however, this has not been determined at this time.

Transportation of students and faculty to the site will include both buses and single-occupant vehicles, depending on the associated program or event. However, programs will primarily utilize bus transportation of students to the site.

The following components of the Kāpae’loa Cultural Learning Project are illustrated in the Conceptual Site Plan, Figure 2-2, which represents the maximum proposed use. The building areas may be reduced during the design and construction phase.

**Outdoor Activity Lawn.** The outdoor activity lawn area located between the dormitories and the educational pavilion will serve as an instructional and educational area. The activity lawn will also provide access to the shoreline and accommodate educational activities associated with night sky. Views of the mountains and the ocean can be appreciated from this area. The outdoor activity lawn will be landscaped with native plant.

**Educational Pavilion.** The educational pavilion will compose of approximately 2,000 SF of assembly area, approximately 1,400 SF of wrap-around covered lanai, and approximately 1,200 SF of support areas which include storage/utility room, food preparation area, and restrooms. The educational pavilion will support educational activities at the project site. The pavilion will be semi-outdoor with weather enclosure capabilities, such as folding or sliding doors.
CONCEPTUAL SITE PLAN
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

Figure 2-2

(SOURCE: GROUP 70 INTERNATIONAL, INC.)
Two outdoor showers will also be provided at the educational pavilion. The facility will have a maximum height of 25 ft.

**Dormitories.** Dormitories will provide overnight stay capability that is essential to the educational programs such as night sky star gazing and navigation curriculum. The accommodations will also support other KS North Shore stewardship programs including the archaeological youth field school and Loko Ea fishpond restoration project. The four dormitories can provide a maximum of 32 bunk beds, which can accommodate up to 64 students. Each dormitory will be single-story with restrooms/showers facility and a covered porch. Two accessible dormitories will be provided, one for each gender. The maximum height of the dormitories will not exceed 25 ft.

**Caretaker’s Residences.** Two residential units will support property management function of the on-site caretakers. The caretakers’ presence is necessary to secure the site due to known trespassing and other unwanted activities on the land due to the current lack of presence. The residential units will “bookend” the property. Each residence will have up to 2,500 SF of interior space with a maximum of five bedrooms, three bathrooms, a kitchen, an open dining/living area, and a small covered lanai. The residences will be two stories (25 ft. max. height) and each will have a 2-car carport.

**Educational Native plant Garden.** A native plant garden at the Kāpaeloa Cultural Learning Project will be located at the north end of the property (minimum 400 SF). The garden will serve as an important learning tool that educates youths about native coastal plants and will also support propagation of native plant and restoration of cultural landscapes.

**Off-Street Parking and Loading Area.** Off-street parking will be provided within the Kāpaeloa Cultural Learning Project. The caretaker’s residences can accommodate at least four cars in the two carports. There will be permanent spaces that can support 27 vehicles, including two accessible stalls. In addition, there will be space to accommodate up to four buses used to transport students to and from this center. These vehicle and bus parking spaces will support the parking demand of the largest educational gatherings of approximately 100 participants. A loading space will be provided near the dormitories and the educational pavilion.

2.3.1 **Shoreline Setback and Coastal Flood Zone**

No structures will be constructed within the 40-foot shoreline setback area. Structures that will be located in the coastal flood zone (VE) will be raised above the 18 ft. base flood elevation.

2.3.2 **Estimated Development Costs**

The costs for design and construction of the Kāpaeloa Cultural Learning Project are estimated at approximately $4 million.

2.3.3 **Sustainable Design Aspirations**

The KS Kāpaeloa Cultural Learning Project’s building design and construction aims to implement sustainable building design and practices where applicable. Design strategies will include the following:
incorporating natural lighting to illuminate interior spaces,
installing energy-efficient electrical systems to maximize energy savings,
installing efficient plumbing systems to save water,
installing Volatile Organic Compound (VOC)-free building materials and finishes to provide healthy working environments,
incorporating architectural design features such as building orientation to maximize view, land and sea breezes, and minimize sun exposure for maximum comfort, and
no artificial means of cooling (mechanical AC)

2.4 PROJECT UTILITIES AND INFRASTRUCTURE

Group 70 International, Inc. (June 2011) prepared a Preliminary Engineering Report (PER) to address roadway, wastewater, water and drainage systems at the Kāpaeloa Cultural Learning Project. The full report is included in Appendix C, which presents the infrastructure improvements planned for the property.

2.4.1 Water

The Board of Water Supply provides service to the project via a 16-inch supply main. The existing water system is presently adequate to accommodate the proposed development. The proposed water infrastructure on the site will include the installation of a water meter, water service lateral, and service connections to the new buildings. KS will be required to pay BWS Water System Facilities Charges for resource development, transmission and daily storage. Non-potable water is not available as a water source from BWS.

On-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department. Four additional fire hydrants will be installed on the project frontage along Kamehameha Highway to provide fire protection for the buildings on-site, and will conform to the Uniform Fire Code (UFC) and Board of Water Supply’s Water System Standards.

2.4.2 Wastewater

There is no existing municipal wastewater collection system serving the project site. The existing cesspool that served the previously demolished cottage will be removed or abandoned. It is anticipated that five separate Individual Wastewater Systems (IWS) will be required to serve the project site. Each IWS will consist of a septic tank and leach field system to provide treatment and disposal of wastewater. Wastewater flow is projected at a maximum of 6,525 gallons per day (gpd). This estimated flow rate is within the maximum allowable for IWS. The wastewater systems at the project will conform to the State Department of Health requirements. Refer to Appendix C, Preliminary Engineering Report (Group 70 International, Inc).

2.4.3 Drainage System

There are no existing drainage systems onsite, but there is an 18-inch culvert that discharges runoff onto the project site from Kamehameha Highway. Runoff from the culvert will be routed through the site and appropriate BMPs will be used as required by drainage standards. The post development drainage patterns will continue to follow pre-development drainage patterns, and
runoff will typically sheet flow from the highway across the site through landscaping and into the ocean.

2.4.4 Solid Waste Disposal

Solid waste from the project site will be transported to an approved City and County of Honolulu refuse disposal site by a private refuse collection company. A recycling program will also be implemented at the Cultural Learning Project.

2.4.5 Other Utilities

The project will require installation of electrical supply infrastructure and communication lines (telephone, cable).

2.4.6 Access, Roadways, and Parking

Kamehameha Highway in the vicinity of this project is a two-lane, two-way highway with a posted speed limit of 35 miles per hour. Kamehameha Highway provides the only regional access to the communities of the O‘ahu North Shore. Vehicular access to the Kāpaeloa Cultural Learning Project will be from Kamehameha Highway. Driveway, accessible parking, bus parking, and loading area will be asphalt-paved. Other parking spaces may be grass- or gravel-paved. The proposed driveway is anticipated to be located within the vicinity of the existing driveway, which may require reconfiguring to conform to the driveway access requirements as specified in the State of Hawai‘i, Department of Transportation, Highways Division, Standards for Access Driveways into State Highways, (1975).

The project is anticipated to generate a maximum of 30 peak hour trips at the largest educational event (approximately 100 participants). A peak use event assumes 27 single-occupant vehicles and three buses that will be able to transport 75 to 90 participants (approximately 25 to 30 persons per bus). Daily vehicle trip generation will typically be limited to the caretakers’ vehicles. Event-oriented vehicle traffic will not occur on a daily basis. The 30 peak hour trips is far less than the 100 peak hour directional trips which the State DOT uses as a threshold for requiring preparation of a Traffic Impact Assessment Report.

2.5 CONSTRUCTION CHARACTERISTICS

The development of the project site will require vegetation clearing, grubbing, minor grading and excavation (cut and fill), general construction, and landscaping.

2.5.1 Earthwork

The project will require general excavation and ground disturbance related to the construction of the proposed project. The estimated earthwork quantity for the Kāpaeloa Cultural Learning Project is approximately 6,000 cubic yards. Excess material from on-site excavation will be redistributed on-site for landscaping and embankment uses. The project is located along the shoreline and in areas where Jaucus sands exists. Although no subsurface cultural resources were identified in the archaeological investigation, care must be taken in earthwork to avoid potential disturbance of buried cultural resources. Excavation at the project site will be conducted in accordance to the
archaeological inventory survey report’s mitigation methods approved by the State Historic Preservation Division (SHPD).

2.5.2 General Construction

The construction of the facility will include the formation and placement of concrete foundations, the installation of mechanical and electrical equipment and wiring, general carpentry, structural framing and roofing, painting, and other trades and work associated with typical construction activities.

2.6 PERMITS

The following land use and construction permits are anticipated to be required for the project. Additional permits and approvals may also be required.

2.6.1 State of Hawai‘i

Department of Health
• National Pollutant Discharge Elimination System (NPDES)
• Individual Wastewater System (IWS)

Department of Transportation
• Highway Division Driveway Permit

2.6.2 City and County of Honolulu

Department of Planning and Permitting
• Conditional Use Permit - The school project site is currently zoned R-5 Residential District. The intent of the R-5 Residential District is to allow for urban residential development. Non-dwelling uses that support and complement residential neighborhood activities are also permitted. School use is allowed in the R-5 Residential District as a conditional use. The proposed project will include school and supporting facilities which will serve as a hands-on cultural learning center for school-age children (Grades K-12) participating in KS programs. The dormitories and the caretaker’s residences will be part of the school facilities. Per the LUO, a Conditional Use Permit (CUP) Minor will be required to allow for school uses.
• Special Management Area (SMA) Use Permit - The project is located within the County Special Management Area. The school and support facilities will require a SMA Use Permit. The estimated construction budget of the proposed project is over $125,000, which requires approval of a Special Management Area Use Permit-Major.
• Building permit for building, electrical, plumbing, driveway, and demolition work
• Grubbing, grading, and stockpiling permit
• Permit to excavate public right-of-way

Board of Water Supply
• Water Use Permit
3.0 DESCRIPTION OF THE ENVIRONMENTAL SETTING, POTENTIAL IMPACTS AND MITIGATION MEASURES
3.0 DESCRIPTION OF THE ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This section describes the existing environmental setting and identifies possible short-term and long-term impacts of the proposed project. Strategies to mitigate potential impacts are also identified.

3.1 CLIMATE

Existing Conditions
The climate at the project site, on the North Shore of O‘ahu, is mild and semi-tropical with slight seasonal variations. The average maximum daily temperature ranges from 78 °F to 87 °F, with an average minimum temperature ranging from 60 °F to 68 °F. Rainfall for this area is between 39 to 59 inches annually, with most of it occurring between November and April.

Northeasterly winds prevail much of the time throughout the state of Hawai‘i. Typical wind velocities range from 3 to 14 knots. During the summer months stronger, more persistent trade winds result with the location of the North Pacific high pressure system. Light and variable westerly “kona” winds occasionally replace this pattern, most often in the winter.

Anticipated Impacts and Mitigation Measures
The proposed action will have no short-term or long-term effect on climatic conditions, therefore, no mitigation measures are required.

3.2 GEOLOGY AND TOPOGRAPHY

Existing Conditions
The Island of O‘ahu is comprised of two major extinct volcanoes, Wai‘anae and Ko‘olau. The project site is situated on the Schofield Plateau, an alluvial fan of erosional unconformity created by the Wai‘anae Range to the west and the Ko‘olau Range to the east. This specific area of the North Shore is generally characterized by gently sloping topography. Gentle topography exists on the lowland makai parcel, rising dramatically at the coastal bluff to the higher level agricultural slopes.

The project area is located within the ahupua’a of Kawailoa (the long water) in the district of Waialua on the northern side of O‘ahu. This traditional land unit is bordered by the ahupua’a of Waimea to the northeast, the ahupua’a of Pa‘alaa’a to the southwest, the Ko‘olau Range to the east, and the ocean to the northwest. From the Ko‘olau Mountains, Kawailoa extends down slope with the southern boundary at Opae‘ula Stream and the northeastern boundary along the ridge between Kamananui and Kaiwiko‘ele Streams.

The project site varies in elevation but generally slopes from the highway toward the shoreline. Elevations range from approximately 18 feet to 25 feet above mean sea level (MSL) along the highway right-of-way, to an elevation of 8 feet to 14 feet near the shoreline (vegetation/debris line). Along the majority of the highway frontage, there is a natural earth berm preventing road runoff from entering the site.
Anticipated Impacts and Mitigation Measures

Short-term impacts to the site will include small quantities of earth movement required for implementation of this project. There will be no substantial alteration to the existing topography of the project site. The development areas on the project site will be leveled including the educational pavilion, dormitories, outdoor activity areas, caretaker’s residences, driveway and parking areas. The site will be graded to allow the majority of runoff to sheet flow from the highway across the driveway and parking lot, slowed through the vegetation in the landscaping, to allow for infiltration. There will be stormwater flow discharge into the ocean during peak flow periods. The site grading will also closely follow the existing grades to the extent possible. More extensive grading will be required where the existing 18-inch culvert discharges onto the site. Mitigation measures related to soils and grading are described in the next section.

3.3 Soils

Existing Conditions

According to the U.S. Department of Agriculture Soil Conservation Services (USDA) soil survey data (Figure 3-1) the sediments within the project area consists of Waialua Stony Silty Clay (WIB) and Kaena Very Stony Clay (KanE). Soils of the Waialua series consists of “moderately well drained soils on alluvial fans... developed in alluvium weathered from basic igneous rock... used for sugarcane, truck crops, orchards and pasture”. Soils of the Kaena series consist of “very deep, poorly drained soils on alluvial fans and talus slopes... developed in alluvium and colluvium from basic igneous material... used for sugarcane, truck crops, pasture, and homesites.”

Portions of the project area consists of the Jaucas series which are described as “excessively drained, calcareous soils that occur as narrow strips on coastal plains, adjacent to the ocean... developed in wind and water deposited sand from coral and seashells.” A representative profile of this soil type is single grain, pale brown to very pale brown, sandy, and more than 60 inches deep. Permeability is rapid, runoff is very slow to slow, and the hazard of water erosion is slight. Wind erosion is a severe hazard where vegetation has been removed. Listed uses for this soil type include pasture, sugarcane, truck crops and urban development.

Anticipated Impacts and Mitigation Measures

Preparation of the land for construction will involve short-term impacts associated with clearing and minor grading operations. Given the limited nature and low habitat value of existing vegetation, clearing operations will have little affect on the amount of quality habitat present on-site. Clearing and grubbing activities during construction will temporarily disturb the soil retention values of existing vegetation and expose the soils to erosion forces. Primary fugitive dust control methods that will be implemented include regular watering of exposed soil areas, good housekeeping on the job site, and prompt landscaping, covering or paving of bare soils areas where construction is completed. Despite construction site watering programs and temporary ground cover, wind erosion will cause some limited soil loss. Once construction is complete, ground cover planting, hardscape and other landscaping will be in place, effectively ending the short-term soil loss.

Measures will be taken to protect against soil runoff and wind erosion during site preparation. Runoff will be controlled in compliance with the City and County of Honolulu’s “Rules Relating to Storm Drainage Standards,” the City’s Grading Ordinance, and NPDES construction stormwater permit conditions. Typical mitigation measures will include appropriately stockpiling materials
NATURAL RESOURCES CONSERVATION SERVICE SOIL SURVEY MAP
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

FIGURE 3-1

(Source: United States Natural Resources Conservation Service Survey)
on-site to prevent run-off and establishing landscaping as early as possible on graded areas. There will be no long-term adverse effects to soils at the site due to landscape management.

### 3.4 SURFACE WATER AND DRAINAGE

**Existing Conditions**
The project site varies in elevation but generally slopes from the highway toward the shoreline from an elevation of approximately 18 feet to 25 feet MSL along the right-of-way to an elevation of 8 feet to 14 feet at the shoreline (vegetation/debris line). Along the majority of the road frontage, there is a natural earth berm preventing road runoff from entering the site.

Runoff within the project vicinity generally drains from mauka to makai and is intercepted by the highway, which runs parallel to the shoreline. The highway drainage system consists of drainage swales, drain inlets and culverts that convey runoff from the mauka side of the highway and onto the project site. The drainage outlet from the highway is located on the KS property near the existing bus stop at the north end of the project site near Ili‘ohu Place. Runoff from the culvert discharges onto the site and disperses across the property.

Surface water quality in Hawai‘i is generally excellent. Coastal waters are susceptible to point-source pollution (from a discrete or distinct source) and non-point source pollution (from a diffuse or widely spread, scattered unconcentrated source). During high rainfall events, the project area drains towards the beach and ocean. Ocean waters off the project site are designated Class A waters. Beneficial uses of Class A waters are fishing, swimming, surfing, recreational water activities, aesthetic enjoyment, and beach going, which are all very popular in the area. An additional discussion on coastal waters and marine ecology is provided in Section 3.8.

**Anticipated Impacts and Mitigation Measures**
There will be short-term impacts to drainage due to construction activities, which will be managed under the Grading, Drainage and NPDES approvals. The drainage pattern with the completed project will continue to follow the pre-development flow pattern. The site will be graded to allow the majority of runoff to sheet flow from the highway across the driveway and parking lot through the landscaping. During very high rainfall events, stormwater runoff crosses this site and enters the ocean. Site grading will closely follow the existing grades, to the extent possible, and an existing berm along the highway will be maintained. More extensive grading will be required where the existing 18-inch highway drainage culvert discharges onto the site. Runoff from the culvert will be routed through the site landscape, and released to the ocean during peak runoff events.

The State Department of Transportation (DOT) has indicated that there are no drainage studies, reports or as-built drawings for the area to identify the quantity of runoff discharged from this culvert. The quantity of runoff that discharges onto the site will be calculated in the site civil engineering design, and runoff will be routed through the site landscaping.

City and County of Honolulu Storm Drainage Standards (January 2000) stipulate that all development projects applying for building permits must address storm water quality through Best Management Practices (BMPs). Since the proposed project is less than five (5) acres, water quality treatment of storm water runoff does not require specific sizing requirements of specific BMPs. However, the project will be subject to approval of a site-specific BMP plan. Although the standards do not necessarily apply to offsite runoff being conveyed through a project, site specific
BMPs are incorporated in the conceptual plan to address storm water quality. Permanent BMPs will include a flow spreader, rock filter berm, and sediment trap surrounding the native plant garden.

3.5 FLOOD AND TSUNAMI HAZARDS

Existing Conditions
The project site is located on the ocean on the North Shore of O‘ahu, which experiences high surf during the North Pacific current high surf season (October to April). A shoreline setback of 40 ft. applies to all structures to avoid natural structural and shoreline dynamics.

The proposed project site is located in flood Zones D and VE as shown on the Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) 15003C0020F for the City and County of Honolulu dated September 30, 2004. See Figure 3-2. Areas within Zone VE are subject to flooding by the 1.0% annual chance flood. Zone VE is described by the FIRM as a coastal flood zone with a velocity hazard (wave action) with a determined base flood elevation. The Hawai‘i National Flood Insurance Program’s (NFIP) Flood Hazard Assessment Map indicates base flood elevation within the project area at 18' elevation. The FIRM describes flood Zone D as an area where the flood hazards are undetermined, but possible. The project shall conform to the appropriate Building Code and City and County of Honolulu rules and regulations for development within the described flood zones.

The project site is also located within the Tsunami Inundation Zone as demarcated on the maps for the Island of O‘ahu, and would need to be evacuated during a tsunami threat. During periods of seasonal high surf, wave wash is known to extend into the makai edge of the project site.

Anticipated Impacts and Mitigation Measures
The project will not develop structures in the shoreline setback area (40 ft. from certified shoreline). This will minimize the potential for storm wave and erosion impacts. In general, flood and tsunami conditions impose no major constraints on the project. There will be no significant short-term impacts due to construction activities. Development at the site will be required to meet applicable building code standards for non-habitable structures in a tsunami zone. Structures that will be located in the coastal flood zone (VE) will be raised above the 18’ base flood elevation. In addition, the long-term site and facility improvement plans will be required to comply with regulations related to structures designed for flood zones. The project will comply with the amended Section 21-9.10, Revised Ordinances of Honolulu 1990, including development standards identified in Sections 21-9.10-4 and 21-9.10-7 applicable to the coastal high hazard district.

3.6 FLORA

Existing Conditions
The flora at the project site largely consists primarily of invasive shrubs, grasses, haole koa, a few kiawe, chirstmasberry trees, and weed plants. The natural vegetation of the project site and surrounding area has mostly been destroyed or heavily degraded by previous development and past agricultural practices. The old O‘ahu Railway Line ran through the project site. In areas of the project site that were previously improved, the flora includes coconut trees, turf grass and
FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP (FIRM)
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

(Source: City and County of Honolulu, Dept. of Planning and Permitting GIS)
palms. Along the coastal shoreline of the property *naupaka, kamani, hau,* and *popolo* grow along the sand and rocky shoreline. No endangered or threatened plant species are known to exist at the property.

**Anticipated Impacts and Mitigation Measures**

Short-term benefits will include the removal of invasive vegetation and weed species. The majority of the current vegetation species on the project site are exotic to Hawai‘i. The project area is typical of highly disturbed lands in the area. The development and operation of the proposed project is not expected to result in adverse impacts to native plant species. Most of the invasive scrub vegetation will be removed. The project landscape improvements and the native plant garden will enhance the natural vegetation on the site and overall appearance.

The long-term benefits includes the native plant garden and site landscaping which will consist of a variety of species including native, non-invasive, and xeriscape in design and placement. Some native dune plants include *Naupaka – Morning Glory (Scaevola taccada)*, the ‘Aki ‘Aki Native Grass (*Sporobolis virginicus*), *Pa‘u o Hi‘iaka – Skirt of Pele’s Sister (Jacquemontia ovalifolia)*, *Ilima (Sida fallax)*, *Alena (Boerhavia repens)*, *HinaHina Ku-Kahakai - Beach Heliotrope (Heliotropium anomalum)*.

The native plant garden and landscaping will incorporate non-invasive, drought-tolerant species to minimize irrigation requirements and water needs. Some of the existing trees will be removed to allow for the construction of improvements.

### 3.7 FAUNA

**Existing Conditions**

Fauna species at the project site include many common introduced birds and mammals. No species currently listed as endangered, threatened or proposed for listing under either the Federal or the State of Hawai‘i’s endangered species programs were detected on the site.

There are several other types of avian species inhabiting the area as well, but none are an endangered species. Because of the geographical mobility of birds, they can appear in the area at any time. Cattle Egrets (*Bubulcus ibis*) and pigeons are common in the project area. Other birds often found in the area may include the Spotted or Lace-necked Dove (*Streptopelia chinensis*); the Barred or Zebra Dove (*Geopelia maugei*); and the Melodious Laughing-thrush (*G.c. canorus*). The Pacific Golden Plover (*Pluvialis fluva*) is a migratory bird found in the area during the winter season. This bird frequents open areas such as lawns in residential areas and feeds along the coastline. Shorebirds also utilize the rocky intertidal zone along the site to feed on invertebrates.

The project site is mainly vacant of mammal species. Dogs (*Canis f. familiaris*), cats (*Felis cattus*) and mongoose (*Herpestes a. auropunctatus*) have been seen on the project site. It is also likely that the Roof Rat (*Rattus r. rattus*), Norway Rat (*Rattus norvegicus*), European House Mouse (*Mus domesticus*) and possibly Polynesian Rat (*Rattus exulans hawaiiensis*), use resources within the general project area. These introduced rodents are deleterious to native ecosystems and the native faunal species that are dependent on them.

The Kawailoa shoreline area to the south of the project site, provides habitats for the protected Wedge-tailed Shearwater (*Puffinus pacificus chlororhynchus*), also known as ‘Ua‘u Kani. These
seabirds nest for four months each year starting around June. Returning to the same nest each year, Wedge-tails nest in shallow burrows one to two meters in length. No individuals or burrows were observed at the project site, likely due to the very rocky shoreline which provides few burrowing opportunities.

**Anticipated Impacts and Mitigation Measures**

Short term impacts to existing fauna habitat will be affected by the cultural learning project. The removal of the existing non-native flora will disrupt the upland habitat during construction. This will displace the avian and mammal species. In the long term, landscaping will create a renewed habitat for the avian and mammal species common to the area.

To reduce the potential for interactions between nocturnally flying shearwaters with external lights and man-made structures, shields will be installed for construction lighting and permanent lighting. This would minimize the threat of disorientation of shearwaters.

### 3.8 COASTAL WATERS AND MARINE ECOLOGY

An assessment of the marine environment offshore was conducted by Marine Research Consultants in October 2010. A full report is in Appendix D.

**Existing Conditions**

Near shore coastal waters in the area of the site are classified as Class A waters by the State Department of Health (DOH). The objective for Class A waters is: "...use for recreational purposes and aesthetic enjoyment be protected. These waters shall not act as receiving waters for any discharge which has not received the best degree of treatment or control compatible with the criteria established for this class." (DOH Water Quality Standards, Title 11, Ch. 54, HRS). Drainage plans for coastal land uses require detention within the property to minimize surface water runoff to coastal waters, in compliance with City and County of Honolulu Drainage Standards.

Marine water quality assessments that have been completed for sites along the North Shore of O‘ahu have shown high quality conditions for standard water quality indicators. Very high mixing conditions exist along this shoreline due to persistent trade winds and surf conditions, which results in the rapid dispersion of suspended sediment and other pollutants contributed to the nearshore waters. During heavy rainfall runoff periods, this coastline experiences suspended sediment loading, however, the strong ocean mixing conditions help to disperse this material within several days.

Marine life in the nearshore region includes benthic reef ecology and a typical Hawaiian reef fish community. Common benthic habitat includes algae and coral sand and a wide range of invertebrate species. There are several threatened and endangered species which occur in the north shore marine environment. Marine animals that frequent the Kāpapela ocean shoreline include *honu*, Green Sea Turtle (*Chelonia mydas*) which is designated as a threatened species. The Hawksbill Turtle (*Eretmochelys imbricata*), less frequently seen than the Green Sea Turtle, is considered endangered. The endangered Hawaiian Monk Seal (*Monachus schauinslandi*) has also been observed of the beaches along the north shore. Federal laws and agencies project these animals and representatives are typically alerted when there is disturbance or abuse.
Species of "food fish" (taken by subsistence and/or recreational fishermen) were rarely observed during the survey, although several small jacks (papio, Caranx melamphygus) were observed on the outer reef. Orange-eyed surgeonfish (kole, Ctenochaetus strigosus), while abundant, were generally not large enough to be considered suitable as "food fish". Numerous spear fishermen were observed throughout the survey area, which is a likely factor in the paucity of observed fish.

The results of the marine assessment of the Kamehameha Schools Kāpaeloa project area indicate that water chemistry analysis and marine biotic communities are controlled primarily by physical forces associated with large surf that occurs seasonally. With the exception of fishing pressure, the area appears largely unaffected by human activities on land. The planned maintenance and improvements to the area planned by Kamehameha Schools should not change water quality of the offshore marine area to any discernible extent.

**Anticipated Impacts and Mitigation Measures**

The proposed project at Kāpaeloa will not have a significant negative or likely even measurable, effect on water quality or marine biota in the coastal ocean offshore of the property. Should the project result in small projected groundwater subsidies due to the disposal of treated wastewater, the strong mixing characteristics of the nearshore environment will rapidly dispose these nutrients. Changes to the marine environment as a result of Kāpaeloa Cultural Learning Project will likely be undetectable, with no change from the present nearshore water quality conditions.

Beneficial uses of Class A water activities will be enhanced by the completion of the planned improvements. The proposed project does not include plans for alteration of the shoreline or offshore areas. The project will have short term effects to water quality during construction, which will be mitigated by runoff and erosion controls as required under the County and State permitting.

In the long term, project operations will not adversely affect ocean water quality and marine species. The project will have on-site drainage controls consistent with County Grading Permit and NPDES Permit requirements. The proposed wastewater treatment and disposal system will meet or exceed State Department of Health standards designed to minimize pollutant discharge to the environment.

### 3.9 ROADWAYS AND TRAFFIC

A Traffic Assessment was conducted by Austin, Tsutsumi & Associates, Inc. in June 2011. A copy of the full report is in Appendix B.

**Existing Conditions**

Access to the project will be through a new driveway directly from Kamehameha Highway. Kamehameha Highway in the vicinity of the project is a two-lane highway with a posted speed limit of 35 miles per hour. Kamehameha Highway provides the only regional access to the communities of the North Shore of O‘ahu.

Public Transit to the project site is available through the City and County of Honolulu The Bus system. There are three bus routes available to the project site: Bus Route 52 - Wahiawa Circle Isle, Route 55 – Kaneohe Circle Isle and 88A North Shore Express. There is a bus stop within walking distance of the project site.
**Anticipated Impacts and Mitigation Measures**

Short-term traffic associated with construction activities will be managed to avoid disruption of highway operations. Long-term operations of the project will be limited to a maximum of 150 participants per week. Since the center is a learning extension of Kamehameha Schools, students will utilize school buses for transportation to the project site. It is also assumed that the majority of participants will be bused to the project site.

The anticipated maximum use includes 27 single-occupant cars and three buses to transport approximately 100 participants. This results in a maximum of 30 vehicle and bus trips.

With a maximum of 30 peak hour trips, the project is not anticipated to create a significant traffic impact on Kamehameha Highway. Once the group has arrived at the property, no significant vehicle and bus movement to and from the property is anticipated to occur on a daily basis.

The preparation of a formal Traffic Impact Assessment Report is not required, as the project’s anticipated trip generation is less than 1/3 of the minimum trip generation criteria warranting Traffic Impact Assessment Report (TIAR) preparation. The Institute of Transportation Engineers’ (ITE) criterion for preparation of a TIAR is a minimum of 100 new trips in the peak direction.

### 3.10 AIR QUALITY

**Existing Conditions**

In Hawaii, both Federal and State environmental health standards pertaining to outdoor air quality are generally met due to prevalent trade winds and the absence of major stationary sources of pollutant emissions. The relative absence of stationary pollutant sources in the area keep air quality in the project area at levels well within the air quality standards. Air emissions occur due to traffic traversing through the area.

**Anticipated Impacts and Mitigation Measures**

Currently, no air quality monitoring stations exist on the North Shore of O’ahu. The proposed project will not negatively impact air quality since no new facility with stationary air emissions is proposed.

There will be short-term impacts to air quality during the construction period in the form of exhaust from construction equipment and fugitive dust from job site activity. A dust control management plan will be implemented to control activities that have a potential to generate fugitive dust. The short-term effects on air quality during construction will be mitigated by compliance with provisions of Hawai’i Administrative Rules, Section 11-60.1-33 on Fugitive Dust. Potential control measures to reduce fugitive dust, particularly with respect to residential neighbors will include:

- Minimizing the amount of dust generating materials and activities by locating dusty equipment in areas of the least impact;
- Providing water source at the site during construction activities;
- Landscaping and coverage of bare areas, through the grading phase;
- Controlling of dust from debris being hauled away from the project site.

Long term air quality effects of the project are minimal. Vehicle and bus emissions will result from transporting of students and faculty and workers associated with operation of the project.
3.11 NOISE

Existing Conditions
The primary noise sources in the area of the project site are related to traffic and urban activities. Kamehameha Highway is the most significant source of man made noise in the project area. Noise levels at the site and surrounding area are generally quiet due to the rural uses for residential and rural land use activities. However, the sound of the ocean is notably loud. As mentioned in the *mele*...“O Waialua, kai leo nui” the prominent natural force in Waialua is the resound of the pounding surf. While this saying has other meanings, its’ literal translation does describe the spirit of the ocean along this coastline.

Anticipated Impacts and Mitigation Measures
Short term noise receptors in the area are the residences in the adjacent ‘Ili’ohu subdivision. Adjoining neighbors will notice noise from the increased activity at the project site. Most of the uses will not generate extended unacceptable levels of noise and will be mitigated by program operation and management. No long-term adverse noise impacts are expected to result from the proposed project.

Construction work at the project site will involve activities that may generate an increase in noise levels. However, such exposures will be only a short-term condition, occurring during specific daylight hours. Construction vehicles and activities must comply with State Department of Health Administrative Rules. The State of Hawai‘i Department of Health’s noise control regulation requires a permit for construction activities that emit noise in excess of 95 decibels. Mitigation measures to minimize construction noise will include the use of mufflers to suppress loud equipment and limitations on the hours of heavy equipment operation.

Long-term noise associated with the operation of the project will primarily be associated with vehicle traffic and group activities. Noise from daytime and nighttime activities will be limited within allowed noise levels to avoid disrupting the adjoining neighborhood.

3.12 UTILITIES

A Preliminary Engineering Report was completed by Group 70 International, Inc. (June 2011). A copy of the full report is in Appendix C.

Electrical and Telephone: Existing overhead Hawaiian Electric Company (HECO) power lines, Hawaiian Telecom telephone lines and Oceanic Cable transmission lines extend along the makai side right of way along Kamehameha Highway.

Anticipated Impacts and Mitigation Measures
The Kāpaeloa Cultural Learning Project will have a small electrical demand for the educational facilities and caretaker’s residences. Electric and communication utility services will not be affected by the implementation of the proposed improvements.

Water: The existing water system is presently adequate to accommodate the proposed development. The Board of Water Supply (BWS) has an existing 16-inch water main extending along Kamehameha Highway fronting the project site. The water meter records also identify an
active water meter assigned to 61-149 Kamehameha Highway, and identify the owner as Kamehameha Schools. The existing water meter is located at the south end of the condemned Kawailoa Beach Park parcel and was probably installed prior to the condemnation to provide water for the entire property.

**Fire Support:** On-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department. The existing 16-inch water main also provides fire protection to the project site. There is an existing fire hydrant fronting the condemned park parcel and another fire hydrant located within the adjacent ‘Ili‘ohu subdivision to the north. However, there are no fire hydrants immediately fronting the project site. The existing fire hydrants spacing along Kamehameha Highway does not conform to the BWS standards with the distance between exiting fire hydrants being greater than 1,200 feet. Under the existing R-5 residential zoning for the existing project parcel, the spacing requirements for single-family residential land use is 350-feet (BWS’s Water System Standards, 2002).

The fire flow requirements for Single-Family (Residential) are 1,000 GPM for a duration of one hour. Four additional fire hydrants will be installed on the project frontage along Kamehameha Highway to comply with the Board of Water Supply’s Water System Standards (2002) and the Uniform Fire Code (UFC).

**Anticipated Impacts and Mitigation Measures**
A new water meter and water service lateral will be installed along the project site. The water service will be sized to serve the domestic and irrigation demand for the project. The water meter size will vary depending on the domestic water demand and the irrigation demand which will need to be evaluated during design once fixture unit counts are available. Due to water resource limitations in the area, the irrigation water supply will be limited to the size of service required to provide domestic flows, and it is assumed that irrigation would be done during off peak hours at night. KS will be required to pay BWS Water System Facilities Charges for resource development, transmission and daily storage. In addition, the project is subject to Board of Water Supply Cross-Connection Control and Backflow Prevention requirements prior to the issuance of the Building Permit Applications.

**Wastewater Disposal:** There is no existing municipal wastewater collection system serving the property at the present time. Moreover, the City and County of Honolulu does not have plans to construct collection and treatment systems for the North Shore area within the proposed development schedule.

Based on consultation with the Department of Health (DOH), Wastewater Branch, no record of cesspool or septic tank installation on the property was found. However, during a site visit in July 2010, an exposed riser pipe was located near the existing driveway to the property close to probable location of the previously demolished house. It is possible that the riser pipe may lead to some type of septic tank or cesspool. The existence and location of the cesspool should be verified and the cesspool should be removed or abandoned as required by DOH regulations.

It is anticipated that five separate Individual Wastewater Systems (IWS) will be required to serve the project site. Each IWS will consist of a septic tank and leach field system to provide treatment and disposal of wastewater. Wastewater flow is projected at a maximum of 6,525 gallons per day (gpd). This estimated flow rate is within the maximum allowable 15,000 GPD for IWS.
**Anticipated Impacts and Mitigation Measures**

The long-term benefits include installation of a wastewater system to support the wastewater needs of the project. The wastewater systems will conform to the State Department of Health requirements and will provide acceptable treatment of wastewater generated by the project uses. Due to the intermittent use of the school facility, typical wastewater volumes will be low, and peak wastewater flows will occur infrequently.

### 3.13 Socio-Economic Characteristics

#### Existing Conditions

The site is located in proximity to the coastal lowlands and popular North Shore beaches of the Hale‘iwa, Waimea Bay and Sunset Beach areas. Several world famous surfing spots, including Waimea Bay and Pipeline, are located in close proximity to the site. Hale‘iwa town is the closest commercial center.

The regional character of the north shore is typified by pockets of low-rise, small scale rural centers and residential communities surrounded by large expanses of agricultural lands, open space and scenic view planes. According to the State of Hawai‘i Data Book (2009), North Shore has 17,724 residents, which is a decrease of 3.6% from 2002. Within Hale‘iwa zip code (96712) area, the median age is 34 years with approximately 9% over the age of 65. Two out of three people are in the labor force and travel on 38 minutes on average to work. The dominant occupation of residents in the area involves education, health and social services at 17%. Approximately 15% of the residents work in the areas of art, entertainment, recreation, accommodation and food.

KS is particularly interested in the native Hawaiian population. Within the census tracts around KS lands, 1,582 persons, or 19% of the total population are native Hawaiian. This is slightly above the O‘ahu average of 17% native Hawaiians. Native Hawaiians on the North Shore have a higher unemployment rate (11%, compared to other North Shore residents at nearly 7%) and have a higher percentage of public assistance (25%, compared to 8% for other North Shore residents). Income, household size and educational statistics are provided below. While household income for native Hawaiian households is above the average North Shore total, when calculated based on average household size, the per person income for native Hawaiian is less than for the total population. The median household size for native Hawaiians on the North Shore is 3.96 persons per household (pph). This is greater than the O‘ahu-wide average of 2.95 pph and for the O‘ahu native Hawaiian population of 3.47. This statistic may relate to the limited opportunities for native Hawaiian families to purchase additional housing for the next generation. It may also relate to the relative higher unemployment numbers and limited resources and purchasing power for the native Hawaiian demographic group on the North Shore. The percentage of native Hawaiian preschool age children on North Shore at 10%, is far below the island-wide percentage of 27%. However, the percentage of North Shore native Hawaiians who are 5 to 18 year old, at 31% is above for island-wide percentage of 27%. Higher education levels differ for native Hawaiians versus total population on the North Shore; while nearly 32% of native Hawaiians have attended and or graduated from college, the percentage is over 55% for all North Shore residents.

**Anticipated Impacts and Mitigation Measures**

Development of the KS project is not expected to result in negative impacts to socioeconomic conditions. The project intends to improve the socio economic conditions at a small scale through the provision of educational programs. The project will create new employment opportunities
directly and indirectly. A few employees will be needed to maintain the school facility and the native plant garden. The educational programs will be conducted by KS personnel.

3.14 Archaeological Resources

An Archaeological Inventory Survey (AIS) was completed for the project by Cultural Surveys Hawaii, Inc. in May 2011. A copy of the full report is included in Appendix E. The following section provides a description of the AIS and findings for the project area.

Existing Conditions

Previous archaeological investigations have identified numerous pre-contact historic properties in the immediate vicinity of the project area including: heiau, a fishing shrine, a sacred stone, subsurface cultural deposits (midden & artifacts), and platforms (McAllister 1933; Athens & Shun 1982). Previous archaeological investigations have also identified post-contact historic properties in the vicinity of the project area primarily associated with OR&L railroad infrastructure (bridges, railroad beds, etc.).

The current investigation identified two post-contact habitation sites (SIHP 50-80-01-7144 & 50-80-01--7145) and a remnant of the O.R. & L. railroad berm (SIHP -50-80-01-2489). The locations of these sites on the property are shown in Figure 3-3. It is very likely that subsurface historic properties, associated with both pre- and post-contact land use, are present within the project area in the form of cultural layers and/or structural remnants buried by modern and/or historic fill layers.

Anticipated Impacts and Mitigation Measures

Land disturbing activities may uncover burials or other cultural resources. Should historic, cultural or burial sites or artifacts be identified during ground disturbance, all work should immediately cease and the appropriate agencies notified pursuant to applicable law.

In order to mitigate the potential damage to these potential historic properties within the project area, it is recommended that project construction proceed under an archaeological monitoring program. The specifics of this monitoring program will be reviewed and approved by the State Historic Preservation Division. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project’s non-burial archaeological deposits, should any be discovered.

No further historic preservation work is recommended for SIHP #'s 50-80-01-2489, 50-80-01-7144, and 50-80-01-7145. Sufficient information regarding the location, function, age, and construction methods of these historic properties has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities.
LOCATION OF DOCUMENTED HISTORIC PROPERTIES WITHIN THE PROJECT AREA
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

(Source: Cultural Surveys Hawaii, Inc.)

FIGURE 3-3
3.15 Historic and Cultural Resources

A Cultural Impact Assessment (CIA) was completed for the project by Cultural Surveys Hawaii, Inc. in May 2011. A copy of the full report is included in Appendix F. Hawaiian organizations, agencies, and community members have been contacted for the CIA study.

The CIA study interviewed several knowledgeable individuals with cultural expertise and/or knowledge of the project areas and vicinity. The following section provides a description of the CIA and findings for the project area.

Existing Conditions

In pre-Contact and early historic times, the project area was part of a fishing village, or a scattering of small fishing villages, extending from the west side of Waimea Bay back towards Waialua. This area along the coast – today the northernmost extent of Kawailoa Ahupua‘a – was known as Kāpaeloa.

Cultivation in and around the project area would have been limited to small gardens rather than extensive irrigated complexes. Project area inhabitants likely exchanged marine resources, which they obtained and managed for other foodstuffs, such as taro, with their more agriculturally invested neighbors.

The project area is uniquely situated in close proximity to four significant native Hawaiian religious sites:

1. A large heiau (temple), Kupopolo, which is associated with Ka‘opulupulu, the last O‘ahu born Kahuna Nui (high priest and counselor to a high chief) of the island;
2. The famous fish-attracting shrine of Keahuohāpu‘u on a celebrated rocky point, which appears in the famous song-cycle narrative of Hi‘iaka’s travels, and is also associated with mo‘olelo (stories, oral traditions) about Kāne‘aukai, a fish (or sometimes shark) god;
3. A sacred pōhaku (stone), Kaahakii, a tongue-shaped stone marking the ahupua‘a (land division) boundary between Waimea and Kawailoa; and
4. Pu‘u o Mahuka Heiau at Pūpūkea, which Ka‘opulupulu reportedly ordered it to be built after Kupopolo failed to serve its primary purpose of serving as a place where he could have visions.

Beginning in the early 1800s, the sandalwood trade initiated economic and cultural transformations in Waialua Moku. The demands put on the maka‘āinana (commoners) to harvest wood for trade caused many taro fields to become fallow. As the sandalwood trade collapsed in the 1830s, Protestant missionaries were establishing their presence in Waialua. In the later half of the 1800s, Chinese immigrants began to cultivate rice in areas where taro once thrived. In 1892, there were 180 acres under rice cultivation in Waialua Moku, including Kawailoa, but not Kāpaeloa, which is too dry.

During the Māhele in 1848, nearly the entire ahupua‘a of Kawailoa was awarded to Victoria Kamāmalu. Following the death of Kamāmalu in 1866, Kawailoa Ahupua‘a was passed on to
successive members of the aliʻi. The Bernice Pauahi Bishop Estate Trust presently retains ownership of most of the ahupuaʻa of Kāpaeloa.

LCA documentation indicates a wide range of indigenous Hawaiian subsistence activities being practiced in the vicinity of the project area. The coastal ʻāpana (section) was used for fishing and habitation and the mauka ʻāpana as kula (field) to cultivate sweet potatoes. The pali (cliff) were a source of wauke and hala.

The Oʻahu Railway and Land (OR&L) Company, which connected outlying areas of Oʻahu to Honolulu, reached Waialua in 1898 and ran through the northern half of the project area. In 1899, Dillingham capitalized on the increasing number of visitors to the North Shore of Oʻahu, opened the two-story Haleʻiwa Hotel at Waialua Bay in 1899. The railroad also spurred large scale sugar farming in Waialua. From about 1900 to the 1950s, the Waialua Agricultural Company, later named the Waialua Sugar Company, expanded to eventually reach more than 12,000 acres, including a large portion of Kawaiola Ahupuaʻa, which was leased from the Bishop Estate. The OR&L Company ceased operating its rail line in 1947.

Interviews indicate that kamaʻaina associate Kāpaeloa with several wahi pana or storied places and moʻolelo (myth). Kamaʻaina also maintain a strong connection to the environs surrounding the project area by lived experiences with its marine and freshwater resources. The area is well known for its abundance of fish and marine resources like urchins. The plants in the area were also valuable resource for food, medicine and other uses.

**Anticipated Impacts and Mitigation Measures**

The project is focused on expanding cultural learning with direct experience at Kāpaeloa Cultural Learning Project. The project will further the preservation of cultural traditions and educate KS students about the rich cultural elements of Kāpaeloa and the Waialua region.

The project is anticipated to generate beneficial impacts to native Hawaiian and other ethnic groups. Access to the site and resources for cultural practices customarily and traditionally exercised for subsistence, cultural or religious purposes will be retained and enhanced by the proposed project.

Native Hawaiians and others practice their cultural activities (e.g. limu (seaweed) gathering, shore and reef fishing, marine recreation, worship) in and near the project area and immediate vicinity. Shoreline access on the Waialua side of the property will be available and maintained through the planned City and County of Honolulu park parcel. Kamehameha Schools will continue to consult with local community members and organizations as the Kāpaeloa Cultural Learning Project progresses.

**3.16 VISUAL RESOURCES**

**Existing Conditions**

The project site is located on the edge of the North Shore coastline surrounded by developed urban residential neighborhoods to the east and west, and agricultural pasture land towards the mountains. The existing makai parcel views consist of the surrounding residential neighborhood and of the coastline, as displayed in Figure 3-4. Currently, the invasive overgrown vegetation on the site block most of the views of the ocean from the Kamehameha Highway, except at the
driveway. A small residential structure was removed from this property in 2009.

**Anticipated Impacts and Mitigation Measures**
The existing views of the North Shore coastline will be preserved and enhanced by the proposed improvements. The proposed project will not significantly affect visual resources. However, some new structures will be partially visible from Kamehameha Highway. The project site is currently undeveloped and the improvements will enhance the appearance. Landscaping will be used to improve the visual character of the project site and views of the property from Kamehameha Highway will be enhanced by new landscape vegetation.

### 3.17 Hazardous Materials

**Existing Conditions**
There is no evidence or past reports of hazardous material use, disposal or spill events at this property.

**Anticipated Impacts and Mitigation Measures**
There are no impacts anticipated to result from use of hazardous materials at the property. Use of chemicals in agriculture and facility maintenance will be strictly controlled.

### 3.18 Potential Cumulative and Secondary Impacts

Cumulative effects are impacts which result from the incremental effects of an activity when added to other past present, and reasonably foreseeable future actions, regardless of what agency or person undertake such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. The Kāpaeloa Cultural Learning Project is not anticipated to generate substantial cumulative impacts.

The use of the property for the planned improvements and educational activities will cause minor short-term increases in soil runoff, and minor long-term effects on water use, wastewater generation and traffic. The development of new facilities at the project site will add new structures that will be partially visible from Kamehameha Highway, and extending the area’s built environment. These impacts will not significantly increase the regional cumulative impacts on water resources, water quality and roadway operations.

Secondary effects are impacts that are associated with, but do not result directly from, an activity. The environmental analysis of the proposed project addresses full development of the facilities in the context of known planned or approved land uses in the vicinity. The project is not anticipated to generate secondary impacts or induce growth.
KAMEHAMEHA SCHOOLS – KÄPAELOA CULTURAL LEARNING PROJECT
Draft Environmental Assessment and Application for SMA Use Permit

VISUAL RESOURCES
KÄPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

FIGURE 3-4
4.0 ALTERNATIVES TO THE PROPOSED PROJECT
4.0 ALTERNATIVES TO THE PROPOSED PROJECT

The Draft Environmental Assessment evaluates three alternatives to the proposed project described in Section 2.0. The following provides discussion of the alternatives to the proposed Cultural Learning Project.

4.1 NO-ACTION ALTERNATIVE

The “no-action” alternative would result in the continued use of the land for private residential purposes with higher density potential than the proposed project. In its current state, the land would remain in an undeveloped condition with overgrown non-native vegetation. There would be relatively little use of the property in its current state. Refuse dumping, homeless occupation, and unwanted illegal activities would continue due to lack of an onsite presence. In this alternative, construction of the proposed Kāpaeloa Cultural Learning Project would not occur. The added benefit to the students participating in KS programs would not be available. The no-action alternative would have no impact on soils, runoff, water use, wastewater, visual resources or traffic.

4.2 RESIDENTIAL DEVELOPMENT ALTERNATIVE

An alternative to the proposed project would be the development of the site as a residential development without the educational and cultural components. The project site is currently zoned R-5, Residential District. The subject property area is 151,924 sq. ft. or approximately 3.48 acres. R-5 zoning has a minimum lot size of 5,000 sq. ft., with allowances for roadways and setback, the R-5 residential development alternative could create between 12 to 15 new residential. A project of this scale would be significant and would likely draw community opposition.

In comparison to the neighboring Ili‘ohu subdivision, the residential development alternative would have a similar density as the adjoining neighborhood. In comparison with the proposed project, this alternative action would generate much greater impacts on a consistent basis, including greater water use, wastewater, traffic, noise, and visual impacts.

4.3 CULTURAL LEARNING CENTER/MEETING FACILITY WITHOUT DORMITORIES

A potential alternative use of the property could involve the use of the site as a cultural learning center/meeting facility without dormitories. This alternative would utilize the existing R-5 zoned land for a Meeting Facility under a Conditional Use Permit. Overnight stay will not occur, and students will have to travel to the project site on a daily basis. A night-time cultural education experience would not be available under this alternative, and therefore lack one of the essential educational program values.

The Meeting Facility use might result in greater potential impacts, such as traffic impact from varied daily use, including night time meetings. Kamehameha Schools’ goal is to educate youth about culturally-appropriate stewardship of natural resources. The learning center project objectives could not be achieved in this alternative, and the educational benefits would be significantly reduced. In terms of potential impacts, since the facility would function more broadly for general community use, it is anticipated that there would be greater traffic, energy consumption, water use, and wastewater generation.
5.0 APPLICABLE ENVIRONMENTAL AND LAND USE POLICIES AND PLANS
5.0 APPLICABLE ENVIRONMENTAL AND LAND USE POLICIES AND PLANS

The project’s consistency with applicable State of Hawai‘i and City and County of Honolulu planning and land use objectives, policies, principles and guidelines are discussed below. This is divided into nine (9) sections, based on the law or plan where the objectives and policies, etc. are presented, as follows:

**Federal**
- Americans with Disabilities Act (ADA)

**State of Hawai‘i**
- Hawai‘i State Plan (Chapter 226 HRS)
- Hawai‘i 2050 Sustainability Plan
- State Land Use Law (Chapter 205 HRS)
- Coastal Zone Management Program (Chapter 205A HRS)

**City and County of Honolulu**
- General Plan
- North Shore Sustainable Communities Plan
- Land Use Ordinance (Chapter 21 ROH)
- Special Management Area Review and Procedural Guidelines (Chapter 205 ROH)

5.1 AMERICANS WITH DISABILITIES ACT OF 1991

In 1991, the Federal government enacted the American with Disabilities Act (ADA) to provide equal accessibility for persons with disabilities. Part of this statute is having building design consider the needs of persons with disabilities. Chapter 103-50 of the HRS states, “….all plans and specifications for the construction of public buildings, facilities, and sites shall be prepared so that the buildings, facilities, and sites are accessible to and usable to persons with disabilities.” The disability and communication access board shall adopt rules for the design of buildings, facilities, and site, by or on behalf of the State and Counties.

**Discussion:** The proposed project will comply with ADA requirements.

5.2 HAWAI‘I STATE PLAN

The Hawai‘i State Plan establishes a statewide planning system that sets forth goals, objectives, policies, and priority directions to provide for the wise use of Hawai‘i’s resources and guide the future long-range development of the State. Discussed below is the project’s relationship to the goals and applicable objectives, policies and priority directions.

The goal of the State, as stated in the Hawaii State Plan, is to achieve the following:
- A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai‘i present and future generations.
• A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.

• Physical, social, and economic well-being, for individuals and families in Hawai‘i, that nourishes a sense of community responsibility, of caring, and of participation in community life.

The objectives and policies of the Hawai‘i State Plan that are pertinent to the proposed project are as follows:

**Physical Environment – Land-base, Shoreline, and Marine Resources**
It is the objective of the State to achieve “Prudent use of Hawai‘i’s land-based, shoreline, and marine resources.” A policy for achieving this objective that is applicable to this proposed project is to: “Take into account the physical attributes of areas when planning and designing activities and facilities.”

**Discussion:** The marine and shoreline resources of the project site are the featured assets for the proposed Kamehameha Schools Kāpaeloa Cultural Learning Project. Planning and design for the project included shoreline setbacks, highway setbacks, open space activity areas, and residential and dormitories designed to fit into the rural character of the community.

**Physical Environment – Land, Air, and Water Quality**
It is the objective of the State to achieve “Greater public awareness and appreciation of Hawai‘i’s environmental resources.” A policy for achieving this objective that is applicable to this proposed project is to: “Foster educational activities that promote a better understanding of Hawai‘i’s limited environmental resources.”

**Discussion:** A greater awareness and understanding of unique coastal resources will result from the Cultural Learning Project through the environmental educational programs.

**Socio-Cultural Advancement – Education**
It is the objective of the State to achieve “a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.” A policy for achieving this objective that is applicable to this proposed project is to: “Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.”

**Discussion:** The development of the Kāpaeloa Cultural Learning Project on the North Shore of O‘ahu expands educational opportunities for students of the Kamehameha Schools beyond the traditional urban campus. The Kāpaeloa Cultural Learning Project will provide outdoor and overnight educational program opportunities in a rural community setting.

**Socio-Cultural Advancement – Leisure**
It is the objective of the State to achieve “adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs.” A policy for achieving this objective that is applicable to this proposed project is to: “Foster and preserve Hawai‘i’s multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.”
Discussion: The project will provide additional cultural educational opportunities for the Kamehameha Schools students and community at Kāpaeo. The proposed project will expand access to a community of users, as opposed to the current limited use of the parcel. Kamehameha Schools will provide cultural and educational program activities at the project site.

**Socio-Cultural Advancement – Culture**

It is the objective of the State to achieve “the enhancement of cultural identities, traditions, values, customs, and arts of Hawaii’s people.” A policy for achieving this objective that is applicable to this proposed project is to: “Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawaii’s people and which are sensitive and responsive to family and community needs.”

Discussion: The Kamehameha Schools Kāpaeo Cultural Learning Project is intended to educate youth about culturally-appropriate stewardship of natural resources, ecosystems, and cultural landscapes. The facility is designed to offer outdoor opportunities and activities that connect students and users to the natural and cultural resources at Kāpaeo. The educational pavilion, dormitories, and native plant garden will support cultural learning programs.

**5.3 HAWAIʻI 2050 SUSTAINABILITY PLAN**

In 2005, the Hawaiʻi State Legislature determined that its government should be responsible not only for resolving daily and pressing issues and public needs, but also provide guidance to assure that the preferred future of our State is met. Recognizing that present and subsequent generations must address sustainability issues essential to Hawaiʻi’s quality of life, the State Legislature enacted Act 8 (SSLH 2005), which provided for the development of a Sustainability Plan to address the vital needs of Hawaiʻi through the year 2050. Act 8 then established the Hawaiʻi 2050 Sustainability Task Force to review the Hawaiʻi State Plan and the State’s comprehensive planning system, and eventually led to the creation of the Hawaiʻi 2050 Sustainability Plan (Hawaiʻi 2050).

The Hawaiʻi 2050 Sustainability Plan has as its main tenants respect for culture, character, beauty, and history of the state’s island communities; balance among economic, community, and environmental priorities; and an effort to meet the needs of the present without compromising the ability of future generations to meet their own needs. The Plan delineates five goals toward a sustainable Hawaiʻi accompanied by strategic actions for implementation and indicators to measure success or failure. Below is a summary evaluation of the project’s compatibility with Hawaiʻi 2050.

THE STATE’S FIRST DEFINITION OF SUSTAINABILITY-
A Hawaiʻi that achieves the following:
- Respects the culture, character, beauty and history of our state’s island communities
- Strikes a balance among economic, social and community, and environmental priorities
- Meets the needs of the present without compromising the ability of future generations to meet their own needs

Goal 1: Living sustainably is part of our daily practice in Hawaiʻi. Develop a sustainability ethic.
Goal 3: Our natural resources are responsibly and respectfully used, replenished and preserved for future generations. Provide greater protection for air, and land-, fresh water- and ocean-based habitats. Incorporate the values and philosophy of the ahupua’a resource management system as appropriate.

Goal 4: Our community is strong, healthy, vibrant and nurturing, providing safety nets for those in need. Strengthen social safety nets. Provide after-school and extra-curricular programs to enable Hawai'i’s youth to broaden their life experiences.

Goal 5: Our Kanaka Maoli and island cultures and values are thriving and perpetuated. Honor Kanaka Maoli culture and heritage. Ensure the existence of and support for public and private entities that further the betterment of Kanaka Maoli. Enable Kanaka Maoli and others to pursue traditional Kanaka Maoli lifestyles and practices. Provide Kanaka Maoli mentors with opportunities to pass on Hawaiian culture and knowledge to the next generation of Kanaka Maoli and others. The power of wisdom comes from communication. Perpetuate Kanaka Maoli food production associated with land and ocean traditions and practices.

Discussion: The Kamehameha Schools Käp aeloa Cultural Learning Project promotes the goals of the Hawai‘i 2050 Sustainability Plan by providing a unique educational program year-round to school-aged children (grade K-12). The program is intended to educate youth about sustainability and culturally-appropriate stewardship of natural resources, ecosystems, and cultural landscapes. The facility will allow Kanaka Maoli mentors to pass on Hawaiian culture and knowledge to the next generation. The educational programs will help perpetuate Kanaka Maoli food production associated with land and ocean traditions and practices.

5.4 HAWAI‘I STATE LAND USE DISTRICT BOUNDARIES

State Land Use Districts are established by the State Land Use Commission in accordance with the State of Hawai‘i Land use Law, Chapter 205 HRS. The basic intent of the law is to regulate the classification and uses of lands in the State in order to accommodate growth and development as needed, and to retain and protect important agricultural and natural resources areas. All State lands are classified as Urban, Rural, Agricultural, or Conservation, with consideration given to county general and development plans in determining the classification.

Discussion: The project site is situated within the State Urban District. Under State Law the counties have sole jurisdiction to determine the types of uses permitted in this district. As will be discussed later, the Urban classification for the project site is consistent with City and County of Honolulu General Plan, North Shore Sustainable Communities Plan, and current zoning.

5.5 HAWAI‘I COASTAL ZONE MANAGEMENT PROGRAM

The Coastal Management Program (CMP) is a comprehensive nationwide program that establishes and enforces standards and policies to guide the development of public and private lands within the coastal areas. In the State of Hawai‘i, the CMP is articulated in the State Coastal Zone Management (CZM) Law in Chapter 205A of the Hawai‘i Revised Statutes. The State CZM objectives and policies address the following 10 subject 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, (9) beach protection, and (10) marine resources. Virtually all relate to potential development impacts on the shoreline, near shore, and ocean area environments. The Hawai‘i CZM Law charges the counties with designating and administering Special Management Areas (SMA) within the State’s coastal areas. Any “development”, as defined by the CZM Law, that is located within the SMA requires a SMA Use Permit (SMP).

The project is located within the Special Management Area and subject to the Hawai‘i Coastal Zone Management and City and County of Honolulu’s SMA policies and controls. The following discusses the project’s compatibility with HRS, 205A.

(1) Recreational Resources
Objective: Provide coastal recreational opportunities accessible to the public.
Policies
(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:
   a. Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;
   b. 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;
   c. Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;
   d. Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;
   e. Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;
   f. Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.
   g. Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and
   h. Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, county planning commissions; and crediting such dedication against the requirements of Section 46-6, HRS.

Discussion: The project site is located along the North Shore near the popular public surf spot known as Uppers. The project site has been subdivided and over 1.0 acre has been conveyed to the City and County of Honolulu for purposes of public access and beach park use. The new facilities at the Cultural Learning Project will not affect lateral access along the shoreline. No new artificial lagoons or reefs are being proposed. The new educational programs planned will increase access to shoreline recreational and educational opportunities for students. The educational programs will include responsible stewardship of ocean and coastal resources.
(2) 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.

Policies:
(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: An archaeological inventory survey and a cultural impact assessment have been conducted for the proposed project. Full reports are available in the Appendices. Information of the cultural and historic resources will be integrated into the educational programs at the project site. In addition, the project has a relationship to Kupopolo, a significant Hawaiian cultural resource located mauka of the project site. The native plants garden at Kāpaeloa Cultural Learning Project is designed to support the development of stewarding Kupopolo by propagating native plant species that can be used to restore the natural and cultural landscape of the ahupua‘a.

(3) Scenic and Open Space Resources
Objective: Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

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

Discussion: The project will protect, preserve and where possible restore or improve the quality of coastal scenic and open space resources. The view from Kamehameha Highway to the ocean is currently blocked by alien vegetation. The project will provide a more pleasing landscape along the highway which will provide a better view from Kamehameha Highway to the coast, while maintaining a sense of privacy for the property. The partial views of new structures will not diminish scenic views. The project will improve the view along the shoreline by replacing overgrown vegetation with managed native plants garden and landscaping.

(4) Coastal Ecosystems
Objective: Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:
(A) Improve the technical basis for natural resource management;
(B) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;
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

(D) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate state water quality standards.

**Discussion:** The Kāpaeloa Cultural Learning Project recognizes the valuable coastal ecosystem including the reefs fronting the project site. An assessment of water quality and marine biotic community structure within the nearshore marine environment has been conducted for this environmental assessment. The water quality study improves the technical basis for natural resource management along the coast fronting the project site. The water study provides information about the existing composition and status of the water chemistry and biotic community structure of the offshore area. This data is helpful in determining the contribution that groundwater and surface flow may have on the composition of nearshore marine community structure. The study also provides mitigative strategies to minimize or eliminate potential impacts to the marine environment.

The Kāpaeloa Cultural Learning Project will not affect water quality or marine biota in the coastal ocean offshore of the property. Runoff will be controlled at the site, along with on-site wastewater management, which will not affect coastal water quality. Receiving waters will benefit by the reduced soil loss from the site due to landscaping.

Although there will be temporary disturbance during construction, there will be no significant impact to plant or wildlife species on the project site or in the surrounding area. Clearing and grubbing activities during construction will temporarily disturb the soil retention values of the limited existing vegetation and expose the soils to erosion forces. Despite construction site watering programs, wind erosion will likely cause some limited soil loss. Erosion and silt runoff during construction phases may result in short-term effects on runoff water quality. Construction activities will comply with permit conditions regulated by City and State authorities.

**Economic Uses**

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

Policies:

(A) Concentrate coastal dependent development in appropriate areas;

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

(C) management area; and

(D) 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:

a. Use of presently designated locations is not feasible;

b. Adverse environmental effects are minimized; and

c. The development is important to the State’s economy.
Discussion: The project site is located along O‘ahu North Shore and planned/zoned for rural residential use. The Kāpaeloa Cultural Learning Project will be consistent with these plans, and provide unique cultural learning opportunities. The project will generate short-term economic benefits from construction activity. Total project construction cost is estimated at approximately $4 million. Increased visitation to the neighborhood and local businesses could potentially expand employment opportunities and on-going expenditures. Long-term economic benefits from the improved facilities will result from the proposed improvements.

(6) Coastal Hazards
Objectives: Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence and pollution.

Policies
(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 pollution hazards;
(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;
(D) Prevent coastal flooding from inland projects; and
(E) Develop a coastal point and nonpoint source pollution control program.

Discussion: The Kāpaeloa Cultural Learning Project site is located within Zone VE and Zone D of the Federal Emergency Management Agency, Flood Insurance Rate Map classifications. In addition, the project site is located entirely within the Tsunami Inundation Zone. In general, flood and tsunami conditions impose no major constraints on the project. The facility development at the site will be outside the shoreline setback. Development at the site will be required to meet applicable building code standards for habitable and non-habitable structures in a tsunami zone.

(7) Managing Development
Objective: Improve the development review process, communication and public participation in the management of coastal resource and hazards.

Policies:
(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 of 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: Kamehameha Schools has consulted with City and County of Honolulu Department of Planning and Permitting to address the required applications for development permits including SMA Use Permit (Major) and Conditional Use Permit. KS has also provided information to the State O‘ahu Island Burial Council related to the planned use of land along the coastal area. No burials were identified in the archaeological investigation. The North Shore Neighborhood Board No. 27 and the community have been consulted in the planning process.
(8) Public Participation
Objective: Stimulate public awareness, education, and participation in coastal management.
Policies:
(A) Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program;
(B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities; and
(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Discussion: Kamehameha Schools use of this coastal property has been discussed with the community during the recent North Shore Plan process. The North Shore Neighborhood Board No. 27 and the community have been consulted during the planning process.

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

Discussion: New structures will be located inland from the shoreline setback. The project does not proposed construction of erosion-protection structures seaward of the shoreline. The project preserves public access through conveyance of a parcel to the City and County of Honolulu for parks and public use purposes. There will be no effect to lateral access across this shoreline.

(10) Marine Resources
Objective: Implement the State’s ocean resources management plan.
Policies:
(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;
(B) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;
(C) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;
(D) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;
(E) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and
(F) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.
Discussion: The Kāpaeloa Cultural Learning Project promotes responsible stewardship of marine and coastal resources. Through the cultural education programs, KS is encouraging the research and development of plants to support stewardship and restoration of marine and coastal resources.

5.6 CITY AND COUNTY OF HONOLULU GENERAL PLAN

The General Plan for the City and County of Honolulu was adopted in 1977, and has been subsequently amended (most recently in 2002). The General Plan is a comprehensive statement of the long-range social, economic, environmental and design objectives for the general welfare and prosperity of the people of O‘ahu. The objectives and policies are organized into 11 subject areas and are intended to guide and coordinate the formulation and implementation of City land use plans and regulations, and budgeting policies and decisions for public facility capital improvements, operations and maintenance. The proposed project has a relationship to the following objectives and policies of the City and County of Honolulu General Plan:

- PART II: ECONOMIC ACTIVITY. Objective C: To maintain the viability of agriculture on O‘ahu. Policy 2: Support agricultural diversification in all agricultural areas on O‘ahu.

- PART III: NATURAL ENVIRONMENT. Objective B: To preserve and enhance the natural monuments and scenic views of O‘ahu for the benefit of both residents and visitors. Policy 4: Provide opportunities for recreational and educational use and physical contact with O‘ahu’s natural environmental.

- PART VII: PHYSICAL DEVELOPMENT AND URBAN DESIGN Objective F: To promote and enhance the social and physical character of O‘ahu’s older towns and neighborhoods. Policy 1: Encourage new construction to complement the ethnic qualities of the older communities of O‘ahu.

- PART IX: HEALTH AND EDUCATION. Objective B: To provide a wide range of educational opportunities for the people of O‘ahu. Policy 1: Support education programs that encourage the development of employable skills.

- PART X: CULTURE AND RECREATION. Objective B: To protect O‘ahu’s cultural, historic, architectural, and archaeological resources. Policy 1: Encourage the restoration and preservation of early Hawaiian structures, artifacts, and landmarks. Objective D: To provide a wide range of recreational facilities and services that are readily available to all residents of O‘ahu. Policy 13: Encourage the safe use of O‘ahu's ocean environments.

Discussion: The Kāpaeloa Cultural Learning Project promotes the objectives of the City and County General Plan by serving as an educational facility for recreational activities, cultural practices, and environmental habitat restoration and preservation activities. The project will facilitate beach-going activities and access. The project will provide organized educational programs that provide increased access to cultural and environmental resources along the shoreline.
5.7 CITY AND COUNTY OF HONOLULU – 2010 NORTH SHORE SUSTAINABLE COMMUNITIES PLAN

The 2000 North Shore Sustainable Communities Plan (SCP) was recently updated. The 2010 NS SCP was adopted in 2011 by the City Council. This EA reflects the plans and policies stated in the 2010 NS SCP. The project site is designated as Rural Residential, refer to Figure 5-1. The 2010 North Shore Sustainable Communities Plan (NS SCP) describes the role of the North Shore in Oahu’s development pattern is to maintain the rural character, agricultural lands, open space, natural environment, recreation resources and scenic beauty of Oahu’s northern coast. The NS SCP proposed land use policies are intended to outline policies for future actions and agency decisions making. General policies are broad statements of intent that express the City’s overall philosophy toward particular land uses. Planning principles and guidelines provide more specific guidance in terms of planning, design and implementation of projects and programs. The following describe areas where the proposed project conforms to policies in the NS SCP.

Open Space and Natural Environment

- **Planning Principles:** Ahupua’a Land Use and Resource Management.

  **Discussion:** The Kāpaeloa Cultural Learning Project will have an opportunity to provide educational programs on the Hawaiian conservation and management values of land use and resource management practices based on respect for natural and cultural processes, love and stewardship of the land and recognition and respect for the close interrelationships between land-based and marine-based resources.

- **Guidelines:** Shoreline Areas.

  **Discussion:** The Kāpaeloa Cultural Learning Project will support the NS SCP shoreline areas guidelines through the preservation and propagation of coastal resources including coastal strand vegetation. New structures will be designed at appropriate scale and character and adhere to the City’s and Federal Emergency Management Agency (FEMA) minimum building elevations and structural guidelines. Views along the coastal highway (Kamehameha Highway) will be improved through the removal of invasive vegetation and replacement with landscaped native vegetation. Public access to Uppers Beach Park will be preserved through the conveyance of portion of this land parcel (over 1.0 acre) by Kamehameha Schools Bishop Estate to the City and County of Honolulu for public park and beach access. The marine-based educational programs will contribute to the protection and preservation effort to enhance native and other resident fish, aquatic species populations and habitats, including coral reefs.

Historic and Cultural Resources

- **General Policies:** 1) Preserve significant historic features from earlier periods. 2) Restore or keep intact sites with cultural and/or religious significance out of respect for the inherent cultural and religious values.

  **Discussion:** An archaeological inventory survey was conducted for the new educational facilities foundations, and areas for the individual wastewater systems to determine the potential for disturbance of any potentially significant archaeological and historical features. Archaeological
monitoring will also be conducted during excavations activities. Access to the site and resources for cultural practices customarily and traditionally exercised for subsistence, cultural or religious purposes will be retained and enhanced by the project.

**Land Use Designation**

- **Guidelines:** The 2010 NS SCP recognizes three categories of residential development: Rural, Rural Residential, and Low-Density Apartment. The NS SCP land use designation for the project site is Rural Residential. Rural Residential designated areas are characterized by smaller building footprints and larger setbacks; low-rise structures, generally not exceeding two stories; rurally appropriated landscaping; and rural roadways with no sidewalk, curbs, and gutters.

**Discussion:** With a Conditional Use Permit, the proposed school use is allowed in the R-5 Residential District. The school structures within the cultural learning project will consist of low-rise residences (up to two stories/25 ft. max. height), an educational pavilion (25 ft. max. height), dormitories (25 ft. max. height), educational native plants garden, and grassed parking area that will blend in with the rural residential surrounding. School use, as allowed by the LUO, is considered a suitable use within the Residential District. The proposed project will comply with the required yard setbacks and height setbacks for “other uses” in the R-5 Residential District, which require much greater setback than dwelling uses.

**Public Facilities and Infrastructure**

- **Guidelines:** Replace outdated individual cesspools with septic tanks and individual wastewater systems. Consider public programs or policies to support private conversion efforts.

**Discussion:** The existing cesspool within the project area will be replaced with new on-site individual wastewater facilities.

### 5.8 City and County of Honolulu – Land Use Ordinance

The purpose of the County Land Use Ordinance (LUO) is to regulate land use in a manner that will encourage orderly development in accordance with adopted land use policies, including the O‘ahu General Plan and the North Shore Sustainable Communities Plan. The LUO is intended to provide reasonable land use and building development and design standards. These standards are applicable to the location, height, bulk and site of structures, yard areas, off-street parking facilities, and open spaces, and the use of structures and land for agriculture, industry, business, residences or other purposes [Chapter 21, Revised Ordinances of Honolulu (ROH)].

**Discussion:** The project site is currently zoned R-5 Residential District (Figure 5-2). The intent of the R-5 Residential District is to allow for urban residential development. Non-dwelling uses that are compatible with residential neighborhood may be permitted through a Conditional Use Permit.

The project includes school and support facilities which will serve as a hands-on cultural learning facility for school-aged children (Grades K-12) participating in KS programs. The dormitories and
COUNTY ZONING
KĀPAELOA, 61-149 KAMEHAMEHA HIGHWAY, WAIALUA DISTRICT

(Source: City and County of Honolulu, Dept. of Planning and Permitting GIS)

Figure 5-2
the caretaker’s and administrator’s residences will be part of the overall school facilities. A Conditional Use Permit (minor) will be obtained to allow the school uses. School facility will meet the standards with respect to minimum lot area and width/depth, minimum front and side yards, maximum building area and height, etc. for “other uses” allowed in the R-5 Residential District. The minimum required off-street parking and bus drop-off area will also be provided.

5.9 CITY AND COUNTY OF HONOLULU – SPECIAL MANAGEMENT AREA GUIDELINES

The entire project site lies within the boundary of the City and County of Honolulu’s Special Management Area (SMA). Proposed improvements within the SMA are subject to SMA permit requirements pursuant to Section 205A, HRS, and Chapter 25 Revised Ordinances of Honolulu. An SMA Approval application will be submitted to the City and County of Honolulu Department of Planning and Permitting.

The objectives, policies and SMA guidelines, as set forth in Chapter 205A, Hawaii Revised Statutes, are intended to ensure that adequate shoreline access is provided, public recreation and wildlife preserves are reserved, and that minimum adverse effects to water, visual and natural resources are assured.

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 (ROH) are used by the City and County of Honolulu Department of Planning and Permitting and the Honolulu City Council for the review of developments proposed in the Special Management Area (SMA). These guidelines are derived from Section 205A-26 HRS. The consistency of the proposed project with the guidelines is discussed below.

1. All development in the special management area shall be subject to reasonable terms and conditions set by the council to ensure that:
   a. Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided to the extent consistent with sound conservation principles;
   b. Adequate and properly located public recreation areas and wildlife preserves are reserved;
   c. Provisions are made for solid and liquid waste treatment, disposition and management which will minimize adverse effects upon special management area resources; and
   d. Alterations to existing land forms and vegetation; except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion, siltation or failure in the event of earthquake.

Discussion: The project will require a Special Management Area Use Permit (Major). This environmental assessment is being prepared pursuant to Chapter 25 ROH and Chapter 343 HRS to support the SMA permit application. Public access to Uppers Beach Park will be preserved through the conveyance of this parcel of land by Kamehameha Schools Bishop Estate to the City and County of Honolulu for public park and beach access. Provisions will be made to ensure solid and liquid waste treatment, disposition, and management will have minimum adverse effects upon special management area resources. Refer to the Preliminary Engineering
Report in Appendix C. The project will require removal of exotic scrub/weed vegetation (non-native species) and minor grading and grubbing for the construction of new facilities. Scenic views from Kamehameha Highway will be improved with new landscaping.

2. No development shall be approved unless the council has first found that:
   a. The development will not have any substantial, adverse environmental or ecological effect except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health and safety, or compelling public interest. Such adverse effect shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which taken in itself might not have a substantial adverse effect and the elimination of planning options;
   b. The development is consistent with the objectives and policies set forth in Section 25-3.1 and area guidelines contained in HRS Section 205A-26;
   c. The development is consistent with the county general plan, development plans and zoning. Such a finding of consistency does not preclude concurrent processing where a development plan amendment or zone change may also be required.

Discussion: Potential environmental impacts of the proposed project and the mitigation strategies to minimize adverse effects are described in Chapter 3 of this EA. Chapter 5 of this EA describes the extent to which the proposed project is consistent with the County General Plan, Development Plans (SCP) and Zoning.

3. The council shall seek to minimize, where reasonable:
   a. Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough or lagoon;
   b. Any development which would reduce the size of any beach or other area usable for public recreation;
   c. Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management area and the mean high tide line where there is no beach;
   d. Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast; and
   e. Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.

Discussion: The project preserves public access to the ocean and shoreline through the conveyance of land to the City and County of Honolulu for public access and beach park use. The new facility and site improvements will be mauka of the shoreline setback. The beach area is mostly rocky shoreline. The project does not restrict access to the shoreline area. Weedy scrub vegetation (a non-native species) along the highway will be replaced by aesthetically pleasing landscaping, including native plants.

Best management practices and other mitigative strategies will be utilized to minimize adverse affects on water quality and existing coastal fishing resources. Educational programs for the site include a focus on the stewardship of marine, coastal and cultural sites of the ahupua‘a.
6.0 DETERMINATION OF SIGNIFICANCE
6.0 DETERMINATION OF SIGNIFICANCE

This section describes the determination that is anticipated with respect to whether or not the proposed project / action will have a significant impact on the environment, and the reasons for this anticipated determination.

6.1 ANTICIPATED DETERMINATION

A Finding of No Significant Impact (FONSI) is anticipated for this project.

As stated below, on the basis of significance criteria, the proposed development is not expected to have a significant impact on the local, County, or Statewide physical or Human Environment.

6.2 REASONS SUPPORTING THE ANTICIPATED DETERMINATION

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project, its expected consequences both primary and secondary, its cumulative impact with other projects, and its short and long-term effects. In making the determination, the Rules establish “Significance Criteria” to be used as a basis for identifying whether significant environmental impact will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of these criteria.

(1) **Involves an irrevocable loss or destruction of any natural or cultural resources.**

There will be no significant destruction of existing natural or cultural resources. While it is not expected, if during the course of construction any cultural or archaeological remnants are unearthed, their treatment will be conducted in strict compliance with the requirements of the Department of Land and Natural Resources.

(2) **Curtail the range of beneficial uses of the environment.**

The action will not curtail the range of potential beneficial uses of the environment. The planned improvements are intended to provide a beneficial educational use while resulting in a minimal loss of beneficial uses of the environment. There is limited existing habitat present on the site, and the project will implement environmentally sensitive measures to address drainage, landscaping and architecture.

(3) **Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.**

The project is consistent with the environmental policies established in Chapter 344, Hawaii Revised Statutes.
(4) **Substantially affects the economic or social welfare of the community or State.**

The project will improve the economic and social welfare of the community and State. The proposed action will generate short-term economic benefits from construction activity. Total project construction cost is estimated at approximately $4 million.

(5) **Substantially affects public health.**

Insignificant or undetectable impacts to public health may be affected by air and noise impacts during construction, but will be mitigated by appropriate control measures. The long-term benefits to positive social and quality of life implications associated with the project outweigh the temporary negative impacts.

(6) **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

The planned improvements will not create significant secondary impacts such as population changes or effects on public facilities. Design and construction work will generate indirect and induced employment opportunities and multiplier effects, but not at a level that would generate any significant expansion. The short-term employment impacts will be beneficial to the local economy.

(7) **Involves a substantial degradation of environmental quality.**

During construction of the project, appropriate Best Management Practices (BMP) will be implemented to ensure that adverse environmental effects are mitigated. The project will not have a measurable effect on water quality or marine biota in the coastal ocean offshore of the property. Runoff will be controlled at the site, and will not affect waters leading to the coast. No substantial degradation of environmental quality is anticipated as a result of project implementation.

(8) **Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.**

The project is not anticipated to generate substantial cumulative impacts upon the environment. The use of the property for the planned improvements and educational activities will cause minor short-term increases in soil runoff, and minor long-term effects on water use, wastewater generation and traffic. These impacts will not add to regional cumulative impacts on water resources, water quality and roadway operations.

(9) **Substantially affects a rare, threatened or endangered species, or its habitat.**

No endangered plant or animal species are located within the limits of the project site. There will be no significant impact to plant or wildlife species on the project site or in the surrounding area. The project will not impact the habitat of the marine species of the green sea turtle, Hawaiian monk seal and humpback whales which are known to frequent the coastal waters and shores of the North Shore of O‘ahu.
(10) **Detrimentally affects air or water quality or ambient noise levels.**

Short-term effects on air, water quality or ambient noise levels during construction will be mitigated by compliance with City and County of Honolulu and State Department of Health rules which regulate construction-related activities. After development, improvements to the site and related infrastructure should not create detrimental impacts to air, water quality or ambient noise levels. On-site drainage measures will minimize effects on water quality and site run-off.

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

The project is located along the shoreline and within the Tsunami Inundation Zone. During periods of seasonal high surf, wave wash is known to extend into the makai edge of the project site. The flood and tsunami conditions are not major constraints to the project. The project will conform to the appropriate Building Codes.

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

The planned improvements will not substantially affect scenic vistas or view-planes. Scenic views from Kamehameha Highway will be improved with new landscaping.

(13) **Require substantial energy consumption.**

Construction of the project will not require substantial energy consumption relative to other similar projects. Sustainability elements integrated with the project will minimize energy use at the project facilities.
7.0 LIST OF REFERENCES
7.0 LIST OF REFERENCES


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8.0 LIST OF AGENCIES, ORGANIZATIONS AND INDIVIDUALS RECEIVING COPIES OF THE EA
### 8.0 List of Agencies, Organizations and Individuals Receiving Copies of the EA

The agencies, organizations and individuals that received copies of the Pre-Assessment Consultation package and this Draft Environmental Assessment are noted below. Also noted are those recipients of the Pre-Assessment Consultation Package that responded with written comments.

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APPENDIX A

Comment Letters and Responses
Pre-consultation Letters and Responses
Thank you for your Pre-Consultation comment letter dated June 21, 2010 concerning the Draft EA for the Kamehameha Schools Käpaeloa Cultural Learning Project.

The Draft EA indicates that the property borders upon waters of the United States, specifically the Pacific Ocean. The Draft EA considers potential impacts to the aquatic environment.

The Draft EA addresses the potential for waters of the U.S. to be affected by construction of project structures, associated ground disturbing activities, and the influx of potential contaminants to the receiving waters of the Pacific Ocean. Specific measures are planned for minimizing site runoff, erosion and introduction of contaminants, consistent with NPDES permit conditions.

We will send you a copy of the Draft EA for your review. Upon receipt, please provide a determination whether a Department of Army (DA) permit for Section 404 activities of the Clean Water Act and Section 10 activities of the River and Harbor Act, may, or may not be, required for the proposed project. We believe, there is no such requirement for the subject project.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments. 

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
Mr. Jeffrey H. Overtan, AICP, LEED AP
Principal, Chief Environmental Planner
Group 70 International
923 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overtan:

Subject: Kamehameha School Kapeloa Cultural Learning Project
Pre-Consultation for Draft Environmental Assessment (DEA)

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project. DOT understands that Kamehameha School proposes to create a cultural learning project consisting of an educational pavilion, six cabins, and one farm dwelling to serve as the caretaker residence on a 4.15-acre site. Access to the project will be from the State highway facility, Kamehameha Highway.

Given the project location, Kamehameha Highway will be impacted. DOT offers the following comments.

1. Prior to the development of the site, it is important that the developer discuss acceptable highway access requirements with DOT Highways Division.

2. The DEA should discuss and evaluate:
   a. Project impacts on State highway facilities in the area such as, Kamehameha Highway;
   b. Short-term and long-term traffic generated by the project;
   c. Construction vehicles and heavy equipment type that will be used on the jobsite.
      Please note that a permit is required from DOT Highways Division to transport oversized equipment and overweight loads on State highway facilities;
   d. Construction activity hours and business hours for the facility upon completion;
   e. Compliance with the National Pollutant Discharge Elimination System (NPDES) permit requirements for construction activity disturbing one (1) or more acres of land area;

f. No additional drainage will be allowed to flow onto the State right-of-way. The grading and drainage plans/study must be submitted to DOT Highways Division for review and approval as; and

8. The requirement that construction plans be submitted to DOT Highways Division for approval for all work done within or affecting the State highway right-of-way.

DOT appreciates the opportunity to provide comments and requests four copies of the DEA when it is available. If there are any questions, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 587-2356.

Very truly yours,

BRENNON T. MORIOKA, Ph.D., P.E.
Director of Transportation
December 13, 2010

Michael Formby, Interim Director
Director of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Subject: Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Kāpaeula Cultural Learning Project
Kāpaeula, Waialua District, Island of O’ahu
(1) 6-1-003: 056

Dear Mr. Formby:

Thank you for your Pre-Consultation comment letter dated July 8, 2010 concerning the Draft EA for the Kamehameha Schools Kāpaeula Cultural Learning Project.

A Traffic Assessment has been prepared for the proposed project by Austin, Tsutsumi & Associates, Inc. The report reflects State DOT Highways Division requirements for acceptable highway access along Kamehameha Highway. The traffic assessment addresses short-term and long-term traffic generated by the project. Consistent with recommendations of the Institute of Transportation Engineers (ITE), a TIAR will not be completed due to the relatively small number of trips generated by the project.

The Draft EA will discuss the degree construction vehicles and heavy equipment that may be used on the jobsite and the need for a permit from DOT Highways Division to transport oversized equipment and overweight loads on State highway facilities. In addition, the Draft EA will discuss and evaluate construction activity hours and business hours for the facility upon completion and any compliance with National Pollutant Discharge Elimination System (NPDES) that may be required for construction activity.

The Draft EA notes that no additional drainage will be allowed to flow on the State right-of-way. Further, the Draft EA discloses that the grading and drainage plans/study will be submitted to DOT Highways Division for review and approval. Construction plans will be submitted to DOT Highways Division for approval for work done within or affecting the State highway right-of-way.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
December 13, 2010

Nancy McMahon, Deputy SHPO/State Archaeologist and Historic Preservation Manager  
State of Hawaii Department of Land and Natural Resources  
State Historic Preservation Division  
601 Kamokila Boulevard, Room 555  
Kapolei, Hawaii 96707

Subject: Pre-Consultation for Draft Environmental Assessment  
Kamehameha Schools Kapaeula Cultural Learning Project  
Kapaeula, Oahu  
(2) 3-5-001:67, 77, 78 (pars.)

Dear Ms. McMahon:

Thank you for your Pre-Consultation comment letter dated June 16, 2010 concerning the Draft EA for the Kamehameha Schools Kapaeula Cultural Learning Project.

Your review of your records indicate that this area is known to contain dense archaeological resources. A 1981 Bishop Museum archaeological survey (SHPD Report No. 0-266) of the neighboring property (TMK 1-6-1-013:001 through :023) identified multiple archaeological sites (SIHP#'s 2483 through 2489), the Ke Ahu O Hapu’u Heiau, and a cultural deposit that likely extends into the north end of the Kamehameha Schools property area. An Archaeological Inventory Survey (AIS) with limited subsurface testing has been completed for this project, and is included in the Draft EA.

You also note that this area is likely used to access the ocean for surfing, fishing and gathering activities. The Draft EA will include a Cultural Impact Assessment that addresses the potential effects of the proposed action on the cultural practices associated with this land.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP  
Principal Planner  

cc: Kalani Fronda, KS
TO: Morris Alta, Administrator  
Land Division

FROM: Ken C. Kawahara, P.E., Deputy Director  
Commission on Water Resource Management

SUBJECT: Pre-Assessment for Draft Environmental Assessment for Kamahānina Schools Kapaeoa Cultural Learning Project, Island of Oahu

FILE NO.: NA  
TMK NO.: (1) 6-1-003.056

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://www.hawaii.gov/dlnr/cwr.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural and natural resource areas into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☐ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EPA as having high water efficiency can be found at http://www.epa.gov/watersense/products/index.htm

☐ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://hawaii.gov/leed/com/initiative/id.php.

☐ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. There may be the potential for ground or surface water degradation/contamination and recommend that proper approval for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:

Additional information and forms are available at http://hawaii.gov/dlnr/cwr/permis/permis_permits.html

☐ 8. A Well Construction Permit(s) is (are) required any well construction work begins.

☐ 9. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 10. If there is (are) water(s) located on or adjacent to this project, if wells are not planned to be used and will be affected by any new construction, then they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 11. Ground water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 12. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.

☐ 13. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.

☐ 14. A Petition to Amend the Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 15. The petition for amendment to the stream diversion flow standard must be submitted to the Hawaii Department of Land and Natural Resources (DLNR) for review and approval.

☐ 16. The petition for amendment to the stream diversion flow standard must be submitted to the Hawaii Department of Land and Natural Resources (DLNR) for review and approval.

☐ OTHER:  
The State Water Code requires that the county water use and development plans be consistent with land use plans and policies, including zoning.

We recommend the draft environmental assessment identify the proposed water source and the projected quantities of water needed to meet potable and nonpotable demands.

If there are any questions, please contact Commission staff at 587-0215.
MEMORANDUM

TO: DLNR Agencies:
  - Div. of Aquatic Resources
  - Div. of Boating & Ocean Recreation
  - Engineering Division
  - Div. of Forestry & Wildlife
  - Div. of State Parks
  - Commission on Water Resource Management
  - Office of Conservation & Coastal Lands
  - Land Division - Oahu District
  - Historic Preservation

FROM: Charlene Unoki, Assistant Administrator

SUBJECT: Pre-Assessment for Draft Environmental Assessment for Kamehameha Schools Kapae'ula Cultural Learning Project

LOCATION: Island of Oahu

APPLICANT: Group 70 International on behalf of Kamehameha Schools

Transmission for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 22, 2010.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections.

We have no comments.

Comments are attached.

Signed: [Signature]
Date: [Date]

COMMENTS

(X) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone D and VE. The National Flood Insurance Program does not have any regulations for developments within Zone D, however, it does regulate developments within Zone VE as indicated in bold letters below.

() Please note that the project site, according to the Flood Insurance Rate Map (FIRM), is also located in Zone ___.

() Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

(X) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44 CFR) whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyson-Bennett, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44 CFR indicates the minimum standards set forth by the NFIP. Your Community’s local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

(X) Mr. Robert Sumimoto at (808) 768-8097 or Mr. Mario Nio Lii at (808) 768-8098 for the City and County of Honolulu, Department of Planning and Permitting.

() Mr. Frank DeMarco at (808) 961-4042 of the County of Hawaii, Department of Public Works.

() Mr. Francisco Ceruto at (808) 270-7771 of the County of Maui, Department of Planning.

() Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

() The applicant should include water demands and infrastructure required to meet project needs.

() Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

() The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

() Additional Comments:

Other:

Signed: [Signature]
Date: [Date]

Should you have any questions, please call Ms. Susan T. Agraam of the Planning Branch at 587-0258.

Signed: [Signature]
Date: [Date]
MEMORANDUM

TO: DLNR Agencies:
   - Div. of Aquatic Resources
   - Div. of Boating & Ocean Recreation
   - Engineering Division
   - Div. of Forestry & Wildlife
   - Div. of State Parks
   - Commission on Water Resource Management
   - Office of Conservation & Coastal Lands
   - Land Division - Oahu District
   - Historic Preservation

FROM: Charlene Unoki, Assistant Administrator

SUBJECT: Pre-Assessment for Draft Environmental Assessment for Kamehameha Schools Kapaeoa Cultural Learning Project

LOCATION: Island of Oahu

APPLICANT: Group 70 International on behalf of Kamehameha Schools

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 22, 2010.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: [Signature]
Date: June 8, 2010

MEMORANDUM

TO: DLNR Agencies:
   - Div. of Aquatic Resources
   - Div. of Boating & Ocean Recreation
   - Engineering Division
   - Div. of Forestry & Wildlife
   - Div. of State Parks
   - Commission on Water Resource Management
   - Office of Conservation & Coastal Lands
   - Land Division - Oahu District
   - Historic Preservation

FROM: Charlene Unoki, Assistant Administrator

SUBJECT: Pre-Assessment for Draft Environmental Assessment for Kamehameha Schools Kapaeoa Cultural Learning Project

LOCATION: Island of Oahu

APPLICANT: Group 70 International on behalf of Kamehameha Schools

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 22, 2010.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: [Signature]
Date: June 8, 2010
MEMORANDUM

TO: DLNR Agencies:
   x Div. of Aquatic Resources
   x Div. of Boating & Ocean Recreation
   x Engineering Division
   x Div. of Forestry & Wildlife
   x Div. of State Parks
   x Commission on Water Resource Management
   Office of Conservation & Coastal Lands
   x Land Division - Oahu District
   x Historic Preservation

FROM: Charlene Unoki, Assistant Administrator

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for Kamehameha Schools Kapolei Cultural Learning Project

LOCATION: Island of Oahu
APPLICANT: Group 70 International on behalf of Kamehameha Schools

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 22, 2010.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed: Charlene Unoki
Date: 6/10/10

Group 70 International, Inc.
925 Bethel Street 5th Floor
Honolulu, Hawaii 96813-4307

Attention: Mr. Jeff Overton

Ladies and Gentlemen:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment for Kamehameha Schools Kapolei Cultural Learning Project

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to Division of Forestry & Wildlife for their review and comment.

The Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Charlene Unoki
Assistant Administrator
December 13, 2010

Morris Atta, Acting Administrator
Charlene Unoki, Assistant Administrator
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Subject: Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Käpaeloa Cultural Learning Project
115-61-003: 056

Dear Mr. Atta and Ms. Unoki:

Thank you for your Pre-Consultation comment letter dated June 23, 2010 concerning the Draft EA for the Kamehameha Schools Käpaeloa Cultural Learning Project. We recognize that the State DLNR Land Division has no comments to offer on this matter at this time.

We appreciate you forwarding a copy to the DLNR Division of Forestry and Wildlife (DOFAW), Division of Boating & Ocean Recreation, Division of State Parks, Commission on Water Resource Management, Land Division – Oahu District and the Engineering Division for their input into the environmental review process.

Division of Forestry and Wildlife - DOFAW

We acknowledge that DOFAW supports the project concept and would be pleased to work with Kamehameha Schools through the watershed partnership program to assist in education related to protecting and restoring healthy forests to O‘ahu. Further, the Natural Area Reserve Program at Kāne‘ohe Point and the Threatened and Endangered Species Program is interested in working with the project to address potential impacts of climate change in the planning process.

Commission on Water Resource Management - CWRM

CWRM notes that under the State Water Code, waters of the State are held in trust for the benefit of the citizens of the State, therefore water use is subject to legally protected water rights. CWRM recommends coordination with the County to incorporate this project into the County’s Water Use and Development Plan and coordination with the respective Planning Department and/or Department of Water Supply for further information. CWRM recommends that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area’s freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. CWRM recommends the use of Best Management Practices (BMP) for stormwater management to minimize the impact of the project to the existing area’s hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. CWRM recommends the use of alternative water sources, wherever practicable. The DEA identifies the planned source of water for the project as the Honolulu Board of Water Supply (BWS). CWRM notes that the State Water Code requires that the County Water Use and Development Plans be consistent with land use plans and policies including zoning. The

CWRM recommends coordination with the County to incorporate this project into the County’s Water Use and Development Plan. The

CWRM recommends coordination with the County to incorporate this project into the County’s Water Use and Development Plan.
DEA identifies the proposed water source (BWS) and the projected quantities of water needed to meet potable and nonpotable demands.

DENR Engineering Division
The DLNR Engineering Division confirms that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zones D and VE. The National Flood Insurance Program (NFIP) does not have any regulations for development within Zone D, however, it does regulate development within Zone VE. The project will comply with the rules and regulations of the NFIP presented in Title 44 of the Code of Federal Regulations (44CFR) when development within a Special Flood Hazard Area is undertaken.

We acknowledge that there are no comments from the following divisions:
- Division of Boating & Ocean Recreation
- Land Division – Oahu District
- Division of State Parks

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
Dear Mr. Wong:

Thank you for your Pre-Consultation comment letter dated June 10, 2010 concerning the Draft EA for the Kamehameha Schools Kapaeloa Cultural Learning Project. In response to your comments the proposed project will comply with the Hawai‘i Administrative Rules (HAR) Chapters 11-54 and 11-55. An application for a National Pollution Discharge Elimination System (NPDES) permit will be submitted to the State Department of Health for review and approval as necessary.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
Mr. Jeffrey H. Overton  
July 15, 2016

Page 2

UNDERGROUND INJECTION CONTROL (UIC)

Injection wells used for the subsurface disposal of wastewater, sewage effluent, return flow, or surface runoff are subject to environmental regulation and permitting under Hawaii Administrative Rules, Chapter 11-23, Underground Injection Control. The Department of Health's approval must be first obtained before any injection well construction commences. A UIC permit must be issued before any injection well operation occurs.

Authorization to use an injection well is granted when a UIC permit is issued to the injection well facility. The UIC permit contains discharge and operating limitations, monitoring and reporting requirements, and other facility management and operational conditions. A UIC permit application form is needed to apply for a UIC permit.

A UIC permit can have a valid duration of up to five years. Permit renewal is needed to keep an expiring permit valid for another term.

Please be sure to send us a copy of the DEA so that we may be able to review the information in these areas and provide comments. If you should have any questions please call me or my staff in the Engineering (for public water systems) or the Groundwater Pollution Control (for UIC) Sections at 586-4258.

Sincerely,

STUART YAMADA, P.E., CHIEF  
Safe Drinking Water Branch  
Environmental Management Division  
SY:slm
December 13, 2010

Stuart Yamada, P.E., Chief
Safe Drinking Water Branch
Environmental Management Division
State of Hawaii, Department of Health
P.O. Box 3378
Honolulu, Hawaii  96801

Subject: Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Kapaeula Cultural Learning Project
Kapaeula, Waialua District, Island of O‘ahu
(1) 6-1-003: 056

Dear Mr. Yamada:

Thank you for your Pre-Consultation comment letter dated July 15, 2010 concerning the Draft EA for the Kamehameha Schools Kapaeula Cultural Learning Project.

A clear and complete description of how drinking water will be supplied to the proposed project is provided in the Draft EA. Water service will be provided by Honolulu Board of Water Supply. An individual wastewater system (IWS) will be developed for the project following DOH standards. No Underground Injection Control (UIC) permit will be required.

Drainage and wastewater management details are addressed in the Draft EA report.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

c:  Kalani Fronda, KS
Dear Mr. Lum:

Thank you for your Pre-Consultation comment letter dated June 29, 2010 concerning the Draft EA for the Kamehameha Schools Kāpāolea Cultural Learning Project.

We note that the subject project is located in the critical wastewater disposal area as determined by the Oahu Wastewater Advisory Committee and also located in the Pass Zone. The property is vacant at this time and located in an area not served by a private or public sewer system.

An individual wastewater system is proposed for the project and will conform to applicable provisions of the Department of Health’s Administrative Rules, chapter 11-62, “Wastewater Systems.” Details of the proposed wastewater system are described in the Draft EA report.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
1. If students will be staying overnight, will there be separate facilities for showering and dining/food preparation for the students and staff?

4. The DEA should disclose how many people each of the cabins would accommodate.

5. The DEA should include a separate site plan and elevation drawings that illustrate the physical layout of the facility and the design of the cabins and pavilion.

6. The pre-consultation states that the site was previously leased for residential use and is vacant. The DEA should disclose the status of the lease and who the lessee or tenant is. The DEA should also include photographs of the site to clearly show the existing condition of the property.

7. The pre-consultation states that there will be a “…nursery to propagate native coastal plants and vegetation related to the stewardship of KS assets in the North Shore region.” The DEA should disclose a list of possible native coastal plants and vegetation to be grown by the proposed nursery.

8. The DEA should discuss how the project conforms or is consistent with relevant objectives and policies of State and City land use policies and regulations including but not limited to the Hawaii State Plan; Chapter 265, Hawaii Revised Statutes (HRS); Chapter 343, HRS; the City’s General Plan; the North Shore Sustainable Communities Plan (SCCP); and the Land Use Ordinance (LUA).

9. The proposed project consists of an educational pavilion, plant nursery, six “cabins,” and a caretaker’s dwelling. Under the LUA, there appears to be more than a single principal use (i.e., active outdoor recreation and multi-purpose meeting facility). Based on information provided so far, the six “cabins” will be treated as vacation cabins in accordance with Section 21-5.600 of the LUA. As such, vacation cabins are only allowed as accessory (customary and incidental) to the active outdoor recreation use. The DEA should disclose which component of the project will be the principal use.

10. The DPP concurs that the proposed project will need a Special Management Area (Major) permit and a Conditional Use Permit (Minor) should the zone change for the project be approved. The proposed AG-2 zoning district only permits one vacation cabin per acre. Therefore, a maximum of four vacation cabins will be permitted under the LUA.

The proposed rezoning from R-5 Residential District to AG-2 General Agricultural District is not considered consistent with the North Shore SCP’s long-range land use policy for the site which shows the site as Rural Residential. The objective of the North Shore SCP Public Review Draft is to maintain the site in Rural Residential which is consistent with the existing R-5 zoning. As such, the DPP recommends that the applicant first amend the North Shore SCP to change the site's land use policy designation to Agriculture, Park, or Preservation which is more consistent with the end use of the proposed project.

11. The DPP recommends that the project should avoid the Shoreline Setback area.

12. Our records indicate that the site is not served by the municipal wastewater system. Therefore, the DEA should disclose how the project’s wastewater requirements will be met.

13. Access to the project will be provided from Kamehameha Highway. Our records indicate that this portion of Kamehameha Highway is under the State’s jurisdiction. Therefore, the DPP defers to the State Department of Transportation regarding Kamehameha Highway access.

14. The section regarding “Purpose of Environmental Assessment” in the DEA should clarify that the preparation of the EA is required for the Special Management Area Permit (Major). The proposed zone change does not meet the criteria for a significant zone change as stated in Ordinance 00-15, Revised Ordinances of Honolulu for the North Shore SCP.

Thank you for the opportunity to comment on this matter. Should you have any questions, please contact Tim Hata of our staff at 768-8043.

Very truly yours,

[Signature]

David K. Taniue, Director
Department of Planning and Permitting

DKT/js

8/8/1151
Dear Mr. Tanoue:

Thank you for your Pre-Consultation comment letter dated July 13, 2010 concerning the Draft EA for the Kamehameha Schools Kapalua Cultural Learning Project.

1. Your land use record of TMK (1) 6-1-003:056 is 4.672 acres. However, the parcel is currently undergoing subdivision into two parcels. Approximately 1.8 acres will become TMK (1) 6-1-003:027 in favor of the project owner. The remainder parcel of approximately 1.192 acres will be conveyed to the City for park and shoreline access purposes.

2. Public access to the shoreline may continue through the conveyance of a portion of the parcel to the City for park and beach access purposes.

3. Chapter 2 of the Draft EA describes details about the project including the following:
   a. The facilities are being developed to support Kamehameha Schools educational, cultural and stewardship programs which include Kamehameha Schools students, faculty, staff, etc.
   b. Will the facility be open to students from other private and public schools? The facility is intended for Kamehameha Schools students, faculty, staff, etc.
   c. The Kamehameha Schools Kapalua Cultural Learning Project will be open to students from other private and public schools. The facility will accommodate a maximum of 206 people based on occupancy codes of 7.5 square feet per person. The facilities are designed to accommodate 16 people per cabin.
   d. Will the facility be open to students from other private and public schools? The facility is intended for Kamehameha Schools students, faculty, staff, etc.
   e. The Kamehameha Schools Kapalua Cultural Learning Project will be open to students from other private and public schools. The facility will accommodate a maximum of 206 people based on occupancy codes of 7.5 square feet per person. The facilities are designed to accommodate 16 people per cabin.

4. A conceptual site plan illustrating the physical layout of the facilities including the location of the cabins and pavilion is provided in the DEA. Public access to the shoreline may continue through the conveyance of a portion of the parcel to the City for park and beach access purposes.

5. The cabins are proposed to accommodate 16 people per cabin. Use of existing groundwater such as the pōhinahina will be a natural component to the landscape. The nursery project will involve removal of existing invasive species such as the Indian rubber vine, Indian privet, haole koa, ficus and autograph tree. The landscape will be an assortment of plants such as the Kukui, lauhala, kamani, milo and kou.

6. TheDEA will describe how the project conforms or is consistent with relevant objectives and policies of State and City land use policies and regulations including but not limited to the Hawaii State Plan; Chapter 205, Hawaii Revised Statutes Chapter 343, the City's General Plan, the North Shore Sustainable Community Plan, the Land Use Ordinance (LUO). Per discussion with DPP in regards to the appropriate LUO for cabin use, the determination is currently undergoing subdivision into two parcels. Approximately 1.8 acres will become TMK (1) 6-1-003:027 in favor of the project owner. The remainder parcel of approximately 1.192 acres will be conveyed to the City for park and shoreline access purposes.

7. The DEA will describe how the project conforms or is consistent with relevant objectives and policies of State and City land use policies and regulations including but not limited to the Hawaii State Plan; Chapter 205, Hawaii Revised Statutes Chapter 343, the City's General Plan, the North Shore Sustainable Community Plan, the Land Use Ordinance (LUO).

8. The DEA will describe how the project conforms or is consistent with relevant objectives and policies of State and City land use policies and regulations including but not limited to the Hawaii State Plan; Chapter 205, Hawaii Revised Statutes Chapter 343, the City's General Plan, the North Shore Sustainable Community Plan, the Land Use Ordinance (LUO).

9. Per discussion with DPP in regards to the appropriate LUO for cabin use, the determination is currently undergoing subdivision into two parcels. Approximately 1.8 acres will become TMK (1) 6-1-003:027 in favor of the project owner. The remainder parcel of approximately 1.192 acres will be conveyed to the City for park and shoreline access purposes.

Best regards,

David K. Tanoue
Director
Department of Planning and Permitting
The project dedicates 50% or more to active agricultural and open space use. The overnight cabins for the Käpaeloa Cultural Learning Project can be defined as an Outdoor Recreational Facilities in the LUO.

10. A SMA Major permit and a CUP Minor will be processed for the proposed project. Since the proposed AG-2 zoning district only permits one vacation cabin per acre, the number of cabins have been reduced to three to comply with the proposed AG-2 zoning district. In addition, an amendment to the North Shore Sustainable Communities Plan (NS SCP) to change the site’s land use policy designation from Rural Residential to Agriculture will be pursued in order to be more consistent with the end use of the proposed project and the NS SCP.

11. The proposed project will avoid the Shoreline Setback area.

12. There is no existing municipal wastewater collection system serving the project site. It is anticipated that two separate Individual Wastewater Systems (IWS) will be required to serve the project site. Each IWS will consist of a septic tank and leach field system to provide treatment and disposal of wastewater. Wastewater flow is projected at a maximum of 300 gpd. This value is well within the maximum allowable for IWS. A preliminary engineering report (PER) was conducted by Gray Hong and Nojima, October 2010 and is available in the Appendix of the DEA.

13. Access to the project will be provided from Kamehameha Highway. The State Department of Transportation has been consulted regarding the proposed project. A copy of their comments are provided in the DEA.

14. The DEA clarifies that the preparation of the EA is required for the Special Management Area Permit (Major).

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
December 13, 2010

Paul S. Kikuchi, Chief Financial Officer
Customer Care Division
City and County of Honolulu Board of Water Supply
630 South King Street
Honolulu, Hawaii 96813

Subject: Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Kapolei Cultural Learning Project
Kapolei, Waialua District, Island of Oahu (1) 6-1-003: 056

Dear Mr. Kikuchi:

Thank you for your Pre-Consultation comment letter dated June 22, 2010 concerning the Draft EA for the Kamehameha Schools Kapolei Cultural Learning Project.

We appreciate your acknowledgment that the existing water system is presently adequate to accommodate the proposed development. We recognize that the Board of Water Supply reserves the final approval on the Building Permit application. On-site fire protection requirements will be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

We recognize that fees include Water System Facilities Charges for resource development, transmission and daily storage. The project is also subject to BWS Cross-Connection Control and Backflow Prevention requirements for issuance of the Building Permit.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have any comments or concerns.

Sincerely,

GROUP 70 INTERNATIONAL, INC.
Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
Dear Mr. Nishimura:

Thank you for your Pre-Consultation comment letter dated June 18, 2010 concerning the Draft EA for the Kamehameha Schools Kāpāelaʻoa Cultural Learning Project.

We recognize that the City and County of Honolulu Department of Design and Construction has no comments at this time.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
Dear Mr. Cudiamat:

Thank you for your Pre-Consultation comment letter dated June 24, 2010 concerning the Draft EA for the Kamehameha Schools Kapalua Cultural Learning Project. We recognize that the Department of Facility Maintenance has no comments. The project will be within privately-owned property and will have negligible impact on City facilities and operations.

As requested, we will remove the City DFM from the EA process. We appreciate your input and participation in the environmental assessment process. Please contact us if you have any questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.
Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Frukia, KS
December 13, 2010

Lester K.C. Chang, Director
City and County of Honolulu
Department of Parks and Recreation
1000 Uluhia Street, Suite 309
Kapolei, Hawaii 96707

Subject: Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Käpaeloa Cultural Learning Project
Käpaeloa, Waialua District, Island of O‘ahu
(1) 6-1-003: 0/56

Dear Mr. Chang:

Thank you for your Pre-Consultation comment letter dated June 29, 2010 concerning the Draft EA for the Kamehameha Schools Käpaeloa Cultural Learning Project. We recognize that the City Parks Department has no comments at this time.

Of note, the adjoining 1.192 acre parcel to the south is in the process of being subdivided and transferred to the City for wayside park use. The land was acquired through a condemnation process with the City which began over 10 years ago (via Don Griffin). No support facilities were planned for this so-called “Upper’s Beach Park” site aside from a small fisherman parking area and scenic viewpoint.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.
Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
Dear Mr. Yoshioka:

Thank you for your Pre-Consultation comment letter dated June 28, 2010 concerning the Draft EA for the Kamehameha Schools Kapaeula Cultural Learning Project.

The Draft EA will address Public Transit serving the project area and the potential impacts of the project on public transit during construction and after the project is completed. A bus stop is located along the project frontage.

A Traffic Assessment has been completed for this project, and the report will be included in the Draft EA. The assessment addresses potential impacts to Kamehameha Highway and the community street network. The project will have very low trip generation and not affect traffic operations on Kamehameha Highway. A copy of the report will be provided to your department for review and comment.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
Subject: Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Käpaeloa Cultural Learning Project
Käpaeloa, Waialua District, Island of O‘ahu

Dear Mr. Silva:

Thank you for your Pre-Consultation comment letter dated June 16, 2010 concerning the Draft EA for the Kamehameha Schools Käpaeloa Cultural Learning Project.

A roadway suitable for fire apparatus access will be provided per 1997 Uniform Fire Code Section 902.2.1. A water supply, approved by the County, capable of supplying the required fire flow for fire protection to all premises upon which facilities or buildings, or portions thereof, are constructed or moved into or within the County will be provided. On-site fire hydrants and mains capable of supplying the required fire flow will be provided per 1997 Uniform Fire Code Section 903.2, as amended. Further, civil drawings will be submitted to HFD for review and approval.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.
Jeffrey H. Overton, AICP, LEED AP
Principal Planner
cc: Kalani Fronda, KS
Dear Mr. Overton,

This is in response to your letter of June 2, 2010, requesting comments on a Pre-Assessment Consultation, Draft Environmental Assessment, for the Kamehameha Schools Kāpae'ao Cultural Learning Project in Wai'alu. This project should have no significant impact on the facilities or operations of the Honolulu Police Department.

If there are any questions, please call Major Kenneth Simmons of District 2 (Wahiawa) at 621-3725.

Sincerely,

LOUIS M. KEALOHA
Chief of Police

By

DAVE M. KAJIHIRO
Assistant Chief of Police
Support Services Bureau

GROUP 70 INTERNATIONAL, INC.
Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS

Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Kāpae'ao Cultural Learning Project
Kāpae'ao, Wai'alu District, Island of O'ahu
(1) 1-1-003: 056

December 13, 2010

Dave M. Kajihiro, Assistant Chief of Police
Support Services Bureau
For Louis M. Kealoha, Chief of Police
City and County of Honolulu
Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

Subject: Pre-Consultation for Draft Environmental Assessment
Kamehameha Schools Kāpae'ao Cultural Learning Project
Kāpae'ao, Wai'alu District, Island of O'ahu
(1) 1-1-003: 056

Dear Mr. Kajihiro,

Thank you for your Pre-Consultation comment letter dated June 9, 2010 noting that the proposed Kamehameha Schools Kāpae'ao Cultural Learning Project should have no significant impact on the facilities or operations of the Honolulu Police Department.

We are providing a copy of the Draft EA for your review. We appreciate your input and participation in the environmental assessment process. Please contact us if you have additional questions or comments.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal Planner

cc: Kalani Fronda, KS
APPENDIX B

Traffic Assessment

Austin, Tsutsumi & Associates, Inc.

June 2011
Mr. Jeffrey Overton  
Group 70 International, Inc.  
925 Bethel Street, 5th Floor  
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Traffic Assessment for the Kamehameha Schools Kapaeloa Cultural Learning Project  
Tax Map Key: (1) 6-1-003:056 (por.)  
Haleiwa, Oahu, Hawaii

Austin, Tsutsumi & Associates, Inc. (ATA) has conducted a traffic assessment for a proposed development at Kawaiiola Ahupuaa Kapaeloa, Oahu.

Project Description

Kamehameha Schools is proposing to develop a 3.48 acre Cultural Learning Project at 64-149 Kamehameha Highway, Kapaeloa on the Island of Oahu, hereinafter referred to as the "Project". The Project will include an outdoor activity lawn, an educational pavilion, dormitory structures (approximately 64 beds), two (2) caretaker's residences with a two-vehicle carport, an educational native plants garden, 27 off-street parking stalls, and support infrastructure. The primary use will be school facility for school-aged children (grades K-12) participating in Kamehameha Schools programs. Since the Project is a learning extension of Kamehameha Schools, students will be utilizing the Kamehameha School's busses for transportation.

Existing Roadways

Access to the project will be through a new driveway directly from Kamehameha Highway. Kamehameha Highway in the vicinity of the project is a two-lane two-way highway with a posted speed limit of 35 miles per hour (MPH). Kamehameha Highway provides the only regional access to the communities of the north shore of Oahu.

Study Scope

The focus of this traffic assessment will be on the trip generation potential of the Project to determine whether it meets the minimum trip generation criteria recommended by Institute of Transportation Engineers (ITE). The Manual of Transportation Engineering Studies, dated 2000, published by ITE, which states:
... in lieu of other locally established thresholds, a traffic access/impact study should be conducted whenever a proposed development will generate 100 or more added (new) peak direction trips to or from the site during the adjacent roadway's peak hours or the development's peak hours."

Based on furnished information from Kamehameha Schools, the Project will be limited to a maximum of 117 participants (including students, advisors, and faculty members) per week. As stated earlier the majority of the participants will be bused from the Kapalama Campus to the Project.

Therefore, in a worst-case scenario, based on a total of 27 parking stalls, 27 single-occupant cars (parking area capacity) will carry 27 persons and three (3) buses will be required to transport the remaining 90 participants arriving by bus assuming approximately 30 participants per bus. This results in 30 trips, which is less than the 100 peak hour directional trips necessary for a Traffic Impact Assessment Report to be warranted according to The Manual of Transportation Engineering Studies.

Conclusions

The following are the conclusions of the traffic assessment study.

- The project is anticipated to generate a maximum of 30 peak hour trips during Kamehameha School's intersession. Therefore, the project will not create a significant traffic impact on Kamehameha Highway fronting the project.

- Influx/Outflux not anticipated to occur on a daily basis

- The preparation of a Traffic Impact Assessment Report is **not required** as the Project **does not meet** the minimum trip generation criteria of 100 new trips in the peak direction which is recommended by ITE regarding the criteria for preparation of a Traffic Impact Assessment Report.

We appreciate the opportunity to prepare this traffic assessment for the Project. Should you require clarification, please feel free to call on me.

Sincerely,

AUSTIN, TSUTSUMI & ASSOCIATES, INC.

By

KEITH K. NIYYA, P.E.
Chief Transportation/Traffic Engineer
APPENDIX C

Preliminary Engineering Report

Group 70 International, Inc.

June 2011
Kāpaeloa Cultural Learning Project
Kawaiola Ahupua’a, Waialua District, O’ahu, Hawai’i
TMK (1) 6-1-003: por. 56

Preliminary Engineering Report
Roadway, Wastewater, Water & Drainage Systems

Owner:
Kamehameha Schools
567 South King Street, Suite 200
Honolulu, HI 96813

Prepared by:

Sustainable Development • Architecture • Planning & Environmental Services • Interior Design • Technology
Honolulu, Hawai’i

June 22, 2011
1.0 INTRODUCTION

1.1 PROPOSED DEVELOPMENT & PROJECT SITE

The project site is located at 61-149 Kamehameha Highway (TMK: 6-1-003: por. 056) near Waimea Bay on the North Shore of Oahu (refer to Figures 1 and 2). The property was condemned by the City and County of Honolulu (C&C) under City Council Condemnation Resolution 94-273 and is in the process of being partitioned into two lots. The resolution lists the Kawaiola Beach Park parcel as TMK: 6-1-03: por. 27 and provides a parcel map and legal description. Although the lot has been condemned and the property is being divided, the conveyance documents for resolution 94-273 have not yet been completed. Therefore, the property boundaries and resulting TMKs have not been assigned. For this report, it is assumed that TMK: 61-003: por. 056 will be the TMK for the remainder parcel, and the property boundary for the remainder parcel as shown on the C&C parcel map will be the property boundary for the proposed development. Refer to the Topographic Survey of Parcel 1 and Remainder of Kawaiola Beach Park Addition, Uppers at Kapaeloa, Kawaiola, Waialua, Oahu, Hawaii, TMK (1)6-1-03: 27, (Hawaii Land Consultants, Rev. July 15, 2009) in the Appendix for the property boundary separating the condemned Kawaiola Beach Park parcel and the remaining project parcel.

The proposed project, also known as the “Kapaeloa Cultural Learning Project”, will include development of the existing vacant property owned by Kamehameha Schools. The proposed project consists of the following: outdoor landscaped activity area, educational pavilion, dormitory structures, two 2-story residential units used as caretaker residences, off-street parking, driveway, educational native plant garden, and support infrastructure. The project site, which is approximately 3.48 acres, was previously leased for residential purposes and is zoned Residential District (R-5) under the City and County of Honolulu Land Use Ordinance (LUO). An Environmental Assessment is currently being prepared and will be submitted as part of the application required for a Special Management Area Use Permit.

1.2 PURPOSE OF REPORT

The purpose of this report is to investigate existing civil infrastructure including roadway, wastewater, water, and drainage systems and to provide a conceptual plan for development of the site. The report will be organized as follows:

- Research and describe the existing conditions and infrastructure
- Develop a conceptual site plan for the project
- Provide a preliminary cost estimate based on the proposed conceptual plan
2.0 Off-Site Roadways

2.1 Existing Adjacent Roadways

Kamehameha Highway is a two-lane roadway within a 50-foot State right-of-way (ROW) fronting the project site. Existing utilities within the ROW include a 16-inch water main, a signal corps line (owned by the U.S. Army), an 18-inch drainage culvert, as well as overhead electrical and communication lines. Access to the project site from Kamehameha Highway is provided by an existing asphalt driveway apron and gravel driveway located on the Haleiwa side of the project parcel.

The State Department of Transportation (DOT), Highways Division, Right-of-Way Branch was consulted regarding access restrictions for the property on July 2, 2010. DOT staff confirmed that map records do not show any access restriction for the project site. The project site has been in residential use and not redeveloped since original construction of the highway. Therefore, it is assumed that a mapped access restriction has not been previously imposed.

2.2 Potential Driveway Improvements

The proposed driveway for the site as shown on Figures 3A and 3B is anticipated to be located within the vicinity of the existing driveway. However, the proposed driveway may require reconfiguring to conform to the driveway access requirements as specified in the State of Hawai‘i, Department of Transportation, Highways Division, Standards for Access Driveways into State Highways, February 1, 1975.

During the design phase, construction plans must be submitted to the DOT detailing the proposed driveway size, location and scope of rehabilitation or reconstruction. DOT will review the plans to determine if any additional roadway improvements or permits are required. Concurrent to this report, a traffic study is being conducted to analyze the traffic impact on Kamehameha Highway from the proposed development to identify any additional improvements required for the project. DOT may impose additional permits, approvals and requirements as a result of that study.
3.0 WASTEWATER INFRASTRUCTURE

3.1 EXISTING CONDITIONS

There is no existing municipal wastewater collection system serving the property at the present time. Moreover, the City and County of Honolulu does not have any plans to construct collection and treatment systems for the North Shore area within the proposed development schedule.

Based on consultation with the Department of Health (DOH), Wastewater Branch, no record of cesspool or septic tank installation on the property was found. However, during a recent site visit (July 6, 2010), an exposed riser pipe was located near the existing driveway to the property close to the probable location of the previously demolished house. It is possible that the riser pipe may lead to some type of septic tank or cesspool. The existence and location of the possible cesspool should be verified and the cesspool should be removed or abandoned as required by DOH regulations.

3.2 POTENTIAL SYSTEM REQUIREMENTS AND CONSIDERATIONS

Since the project site will not be served by a municipal sewer collection system, a new onsite wastewater treatment and disposal system must be constructed as part of the proposed development. HAR Chapter 11-62 allows two options of wastewater treatment works for the proposed site:

- Centralized wastewater treatment plant (WWTP)
- Individual wastewater system (IWS)

An IWS is defined by DOH regulations as an onsite wastewater treatment system that receives and disposes of no more than 1,000 GPD of wastewater. A centralized WWTP is a system that collects, treats and disposes of wastewater from multiple sources with design flows greater than 1,000 GPD. Both options have distinct advantages and disadvantages. A centralized WWTP would allow for potential reuse of the treated effluent and would only require one centralized treatment system instead of multiple IWSs. However, there are several disadvantages in terms of required land area, long-term operation, and cost. First, pursuant to HAR Chapter 11-62, the disposal system for a WWTP would have to be designed to handle a peak flow and provide a 100% backup component. Due to increased size and redundancy requirements, there is inadequate land area to accommodate a subsurface disposal system in the proposed site plan. In addition, the WWTP would have to be operated and maintained by a certified treatment plant operator and would also be subject to more stringent regulatory requirements in terms of monitoring, recordkeeping, and reporting of continuous flow measurement, spills, overflows, etc. Moreover, a WWTP does not lend itself to the highly variable and intermittent wastewater flow that would be the case for the proposed development. Physical, chemical, and biological treatment processes would be subject to frequent start-up and shutdowns throughout the year.

Although an IWS is a decentralized system with separate IWSs required for each building or use, it has distinct advantages in contrast to the disadvantages listed above for a centralized WWTP. Some of the advantages include: a 100% backup component is not required; a certified treatment plant operator would not be required to operate and maintain the IWS; IWSs are more favorable to intermittent wastewater flow; and generally the cost is less. When weighing the advantages and disadvantages of both options, the IWS is the preferred option for this project.
The recommended IWS for the project is commonly used and includes a septic tank for primary treatment of wastewater and a leaching field for effluent disposal. The proposed system does not include secondary biological treatment, tertiary treatment or disinfection, which would only be required if the site conditions required it or if the effluent will be used as reuse water for irrigation. Due to the highly variable and intermittent wastewater flow that is anticipated for project, reuse of effluent is not recommended for the reasons discussed later in the report (refer to the Limitations of Wastewater Reuse section).

For IWS installations, the following regulatory conditions for developments involving buildings other than dwellings would apply:

- Minimum lot area of 10,000 SF
- Minimum 10,000 SF of usable land required for each individual wastewater system (not including area under buildings)
- Wastewater flow to usable land area ratio not to exceed 1,000 GPD/10,000 SF for IWS installations
- Total wastewater flow for the entire development not to exceed 15,000 GPD
- Total wastewater flow into each individual wastewater system not to exceed 1,000 GPD

The project's site area of 151,924 SF satisfies the lot area criteria of 10,000 SF. The usable area criteria equals the lot area less the area under buildings, which is calculated below using the building footprints shown on the project's conceptual plan (refer to Figure 3A) and lot area determined using the conceptual plan and topographic survey (refer to the Appendix). The usable land area calculation is derived as follows:

\[
\text{Usable Land Area} = \text{Project Site Area} - \text{Building Footprint Area} \\
= 151,924 \text{ SF} - 14,880 \text{ SF} \\
= 137,044 \text{ SF}
\]

The wastewater flow to usable land area ratio requirement, which is not to exceed 1,000 GPD/10,000 SF for IWS installations, would be based on 137,044 SF calculated above. Therefore, the usable land area of 137,044 SF for the project site would allow for the installation of multiple IWS with a maximum wastewater flow of 13,704 GPD. The last two criteria listed above limit the total average daily wastewater flow and require estimation of the wastewater projections for the project.

### 3.3 Wastewater Flow Projections

Wastewater flow projections for the proposed development are based on Table 1 of Appendix F in Chapter 11-62 of the Hawai‘i Administrative Rules (HAR). The proposed facilities contributing to wastewater flows include two caretaker residences, dormitory structures, and an educational pavilion (refer to Figures 3A and 3B).

Use of the facilities will be intermittent and dependent on school schedules with primary use during intercessions and weekends. The caretaker dwellings will be utilized on a continuous basis, but will probably contribute a minor portion of the total flow. The following occupancies were provided by Kamehameha Schools for overnight and event usage and will be used to determine the average daily wastewater flow rates.
• Overnight Occupants – 74 persons
  - dormitories (64 persons)
  - caretaker residences (10 persons)
• Daytime Visitors – 53 persons

Based on the above assumptions, the Average Daily Flows in gallons per day (GPD) for the proposed educational pavilion and caretaker residence are shown below. It is essential that the wastewater flow projections be reviewed during the design phase to confirm the above assumptions.

Caretaker Residences (5 bedrooms/3 bath):
Daily Flow Rate = 200 gallons/bedroom/day (HAR Chapter 11-62)
Average Daily Flow = 5 bedrooms x 200 gallons/bedroom/day
**Average Daily Flow = 1,000 GPD EACH**
Recommended septic tank capacity = 1,250 GPD EACH

Educational Pavilion:
Daily Flow Rate for Daytime Visitors = 25 GPD/person
(Based on HAR Chapter 11-62, Appendix F, Table 1 – April 15, 1997; Establishment Assumption – camp with flush toilets, no showers)
Daytime Visitors = 53 persons
Average Daily Flow = 53 persons x 25 GPD/person
**Average Daily Flow = 1,325 GPD**
Recommended septic tank capacity = 2,000 GPD

Dormitories 1 and 2:
Daily Flow Rate for Overnight Occupants = 32 gallons/person/day (GPD/person)
(Based on HAR Chapter 11-62, Appendix F, Table 1 – April 15, 1997; Establishment Assumption – resort camps, night and day, with limited plumbing)
Overnight Occupants = 32 persons
Average Daily Flow = 32 persons x 50 GPD/person
**Average Daily Flow = 1,600 GPD**
Recommended septic tank capacity = 2,000 GPD

Dormitories 3 and 4:
Daily Flow Rate for Overnight Occupants = 32 gallons/person/day (GPD/person)
(Based on HAR Chapter 11-62, Appendix F, Table 1 – April 15, 1997; Establishment Assumption – resort camps, night and day, with limited plumbing)
Overnight Occupants = 32 persons
Average Daily Flow = 32 persons x 50 GPD/person
**Average Daily Flow = 1,600 GPD**
Recommended septic tank capacity = 2,000 GPD

The total wastewater flow for the entire project is 6,525 GPD which is much less than the 15,000 GPD regulatory requirement mentioned previously. The wastewater flow for the education pavilion is greater than the maximum wastewater flow for an IWS of 1,000 GPD. However, HAR-62 allows IWS for buildings with highly variable wastewater flow rates, such as but not limited to schools, parks, and churches, to exceed a design flow rate of 1,000 gallons per day provided that the density criteria is met. This exception should be reconfirmed with DOH during design.
3.4 **Effluent Disposal**

Wastewater effluent disposal should be permissible because the site is situated makai (seaward) of the Board of Water Supply’s “No Pass Zone.” However, the proposed site is located mauka (inland) of the State Department of Health’s Underground Injection Control (UIC) Line, which delineates the boundary between non-drinking water aquifers and underground sources of drinking. This will likely result in potential restrictions on injection wells used for disposal of treated wastewater effluent.

Design considerations for the disposal system downstream of the septic tanks will also take into account various factors such as soil properties, depth to groundwater, existing and finish grades, available land area, proximity to neighboring residences, and flood potential. Several methods of wastewater effluent disposal have been used in the North Shore area:

- Seepage pits
- Injection wells
- Leaching fields or chambers

As mentioned previously, due to the project’s location mauka of the UIC Line, seepage pits and injection wells are not recommended at this time. Therefore, the preferred alternative recommended for effluent disposal for this project are leaching fields or chambers. The following assumptions were used for conceptual sizing and layout of the leaching fields and must be verified prior to the design:

- Assumed onsite soil type: sand and silty-sand soil
- IWS installation may require soil replacement due to high percolation rate of sand
- Assumed percolation rate = 4 minutes/inch (for soil replacement)
- Assumed vertical separation between the bottom of the leach field and the high tide ground water elevation will be greater than 3 feet

Using the above assumptions, the following would be the minimum required absorption areas for the proposed IWSs with average daily flows of 1,000 GPD, 1,325 GPD and 1,600 GPD based on an absorption ratio of 115 SF/200 gallons (specified in Table III of Appendix F, Chapter 11-62 HAR):

- **Minimum area for 1,000 GPD Capacity**
  \[ \text{Minimum area} = \frac{1,000 \text{ gallons} \times 115 \text{ SF}}{200 \text{ gallons}} = 575 \text{ SF} \]

- **Minimum area for 1,325 GPD Capacity**
  \[ \text{Minimum area} = \frac{1,325 \text{ gallons} \times 115 \text{ SF}}{200 \text{ gallons}} = 762 \text{ SF} \]

- **Minimum area for 1,600 GPD Capacity**
  \[ \text{Minimum area} = \frac{1,600 \text{ gallons} \times 115 \text{ SF}}{200 \text{ gallons}} = 920 \text{ SF} \]

Using the absorption areas calculated above, the leaching fields have been located on the conceptual site plan downgradient from the buildings and outside of the 50 foot setback from the shoreline pursuant to HAR 11-62. The leaching fields should be located away from the educational native plant garden to allow separation between the leaching field and plantings. Moreover, plants grown onsite should be limited to non-edible species. It is likely that there are existing cesspools, septic tanks and/or aerobic units within the adjacent residential properties in the Kawaiola Subdivision, which may be in close proximity to the garden.
Cost estimates for the wastewater infrastructure are included in Table 1, Kāpaeloa Cultural Learning Project Civil Conceptual Cost Estimate.

### 3.5 Limitations of Wastewater Reuse

Wastewater reuse systems are comprised of treatment and disposal components that work in partnership on a continual supply and demand basis. The treatment system typically includes a series of physical, chemical, and biological processes in which wastewater is treated to a quality that makes it suitable for one or more beneficial uses and the subsequent supply of recycled water. In Hawai‘i, there has been growing demand for use of this precious non-potable resource for landscape and golf course irrigation. In addition to the economical benefit, reuse can offer a practical and environmentally-friendly means of wastewater disposal from treatment systems.

The treatment and use of recycled water in Hawai‘i is regulated by the Department of Health. Chapter 11-62 of the Hawai‘i Administrative Rules (HAR) presents statutory requirements for wastewater effluent and recycled water quality as well as effluent monitoring and reporting. Moreover, no recycled water systems can be constructed, used, or modified without written approval by the Director of the Department of Health. The regulations also refer to the “Guidelines for the Treatment and Use of Recycled Water” (dated May 15, 2002), which summarizes suitable uses for different categories of recycled water – R-1, R-2, and R-3.

According Table 3-1 of the Guidelines, the use of recycled water at parks and educational facilities require a R-2 water quality and irrigation would be limited to subsurface distribution. This precaution stems from potential health risks surrounding public exposure. Effluent limits for R-2 water are essentially the same as municipal secondary treated wastewater. In addition, the regulations stipulate continuous disinfection of the wastewater effluent.

As mentioned previously, while a WWTP would allow for potential reuse of the treated effluent, there are several disadvantages in terms of land area, long-term operation, and cost. Pursuant to Chapter 11-62, the disposal system for a WWTP would have to be designed to handle a peak flow and provide a 100% back up component. Due to increased size and redundancy requirements, there is inadequate land area to accommodate a subsurface disposal system in the proposed site plan. In addition, the WWTP would have to be operated and maintained by a certified treatment plant operator and would also be subject to stringent regulatory requirements in terms of monitoring, recordkeeping, and reporting of continuous flow measurement, spills, overflows, etc.

The proposed development will involve facilities that are used on an intermittent basis. Thus, there will not be a continuous supply of wastewater, because the waste stream will be generated only when the educational facility is occupied. This constitutes a major reuse limitation, since most secondary wastewater treatment systems involve sensitive microbiological and biochemical processes that rely on constant feed and influent quality. Instead, the treatment system would be subject to frequent start-up and shutdowns not allowing process development to take place. It is highly likely that the system would not be capable of generating a reliable quantity and quality of recycled water. Therefore, alternate potable and non-potable sources must also be available whenever the facility is not in use.

In summary, it is neither practical nor feasible to construct a treatment plant for intermittent use combined with the installation of infrastructure to allow for alternate irrigation supply. Wastewater reuse would not be a viable option for the proposed development.
**4.0 WATER INFRASTRUCTURE**

**4.1 EXISTING CONDITIONS**

Based on as-built drawings and water meter records obtained from the Board of Water Supply (BWS), there is an existing 16-inch water main located within Kamehameha Highway fronting the project site. The water meter records also indicate an active 3/4" water meter assigned to 61-149 Kamehameha Highway and identifies the owner as Kamehameha Schools. The existing water meter is located at the south end of the condemned Kawailoa Beach Park parcel and was probably installed prior to the condemnation to provide water to the entire property. An existing hose bibb was noted on the site visit, which is probably still connected to this water service. Since the Kawailoa Beach Park parcel is now condemned, any water service that crosses onto the project site should be disconnected.

The existing 16-inch water main also provides fire protection to the project site. There is an existing fire hydrant fronting the condemned Kawailoa Beak Park parcel and another fire hydrant located within the adjacent Kawailoa subdivision to the north. However, there are no fire hydrants immediately fronting the project site. The existing fire hydrant spacing along Kamehameha Highway does not conform to the BWS standards with the distance between existing fire hydrants being greater than 1,200 feet. Under the existing R-5 residential zoning for the existing project parcel, the spacing requirements for single-family residential land use is 350-feet (Board of Water Supply’s *Water System Standards*, 2002).

**4.2 POTENTIAL INFRASTRUCTURE REQUIREMENTS**

Since the existing water meter and service lateral is located on the far end of the condemned park parcel, a new water meter and water service lateral will need to be installed fronting the project site. The water service will be sized to serve the domestic and irrigation demand for the project including the caretaker residence, the educational pavilion with centralized bathroom/shower facility, and the educational native plant garden. The water meter size will vary depending on the domestic water demand and the irrigation demand which will need to be evaluated during design once fixture unit counts have been determined. Due to water resource limitations in the area, the irrigation water supply will be limited to the size of service required to provide domestic flows. Furthermore, it is assumed that irrigation will be done during off peak hours and/or at night. Based on the Table 100-19 Fire Flow Requirements of the Water System Standards (2002), the fire flow requirements for Single-Family (Residential) is 1,000 GPM for a 1-hour duration.

Due to the substandard spacing of the existing fire hydrants along Kamehameha Highway, additional fire hydrants will be required to comply with the Board of Water Supply’s *Water System Standards* (2002) and the *Uniform Fire Code* (UFC). A minimum of 4 new fire hydrants are proposed to be installed off of the 16-inch water main within Kamehameha Highway fronting the project site to provide coverage to the proposed buildings onsite. This will meet minimum spacing requirements for single-family residential use.

For purposes of conceptual planning, it is assumed that the proposed educational pavilion will not have a fire sprinkler system. During the design phase after building footprints have been finalized, review of the UFC shall be conducted to determine if additional onsite fire hydrants are required. Along with onsite fire hydrant installation an additional water meter, fire protection main and an approved onsite fire apparatus access road may also be required.

Conceptual locations for the proposed fire hydrants and water meter are shown in Figure 3B. Cost estimates for the water infrastructure are included in Table 1, Kapaeleoa Cultural Learning Project Civil Conceptual Cost Estimate.
5.0 DRAINAGE INFRASTRUCTURE

5.1 EXISTING CONDITIONS

The proposed project site is located in flood Zones D and VE (El 18) as shown on the Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) 15003C0020F for the City and County of Honolulu revised September 30, 2004 (refer to Figure 4). Areas within Zone VE are subject to flooding by the 1.0% annual chance flood. Zone VE is described by the FIRM as a coastal flood zone with a velocity hazard (wave action) with a determined base flood elevation. The base flood elevation for the area within Zone VE is 18 feet. The FIRM describes flood Zone D as an area where the flood hazards are undetermined, but possible. The project shall conform to the appropriate Building Code and City and County of Honolulu rules and regulations for development within the described flood zones.

The project site varies in elevation but generally slopes from the highway toward the shoreline from an elevation of approximately 18-feet to 25-feet MSL along the right-of-way to an elevation of 8-feet to 14-feet MSL at the shoreline (vegetation/debris line). Along the majority of the road frontage, there is a natural earth berm preventing road runoff from entering the site.

Runoff within the project vicinity generally drains from mauka to makai and is intercepted by the highway which runs parallel to the shoreline. The highway drainage system typically consists of drainage swales, drain inlets and culverts that convey runoff from the mauka side of the highway to the makai side of the highway where it is discharged into the ocean. There is an 18-inch culvert that discharges runoff across the highway and onto the project site. It is located near the existing bus stop at the north end of the project site near Iliohu Place. Runoff from the culvert discharges onto the site and disperses across the property and into the ocean.

5.2 POTENTIAL DRAINAGE REQUIREMENTS

The post-development drainage pattern will continue to follow the pre-development flow pattern. The site will be graded to allow the majority of runoff to sheet flow from the highway across the driveway and parking lot through the landscaping and into the ocean. The site grading will also closely follow the existing grades to the extent possible and the existing berm along the highway will be maintained. More extensive grading will be required where the existing 18-inch culvert discharges onto the site. Runoff from the culvert will be rerouted into and through the project site out to the ocean.

The State Hawai’i Department of Transportation (HDOT) has indicated that there are no drainage studies, reports, or as-built drawings for the area to quantify runoff discharged from the culvert onto the site. The quantity of existing runoff that discharges onto the site will need to be estimated and routed through the proposed project during design.

City and County of Honolulu Storm Drainage Standards (January 2000) stipulate that all development projects applying for building permits must address storm water quality through Best Management Practices (BMPs). Since the proposed project is less than 5 acres, water quality treatment of storm water runoff does not require specific sizing requirements of specific BMPs. However, the project will still be subject to approval of a site-specific BMP plan. Although the standards do not necessarily apply to offsite runoff being conveyed through a project, site specific BMPs are incorporated in the conceptual plan to address storm water quality concerns. Permanent BMPs include a flow spreader, rock filter berm and sediment trap (refer to Figure 3B).

Cost estimates for the drainage infrastructure are included in Table 1, Kapaeloa Cultural Learning Project Civil Conceptual Cost Estimate.
6.0 SUMMARY

The proposed “Kāpaeloa Cultural Learning Project” will include development of an existing 3.48 acre property located at 61-149 Kamehameha Highway (TMK: 6-1-003: por. 056) near Waimea Bay on the North Shore of Oahu. The proposed project will create and provide a gathering place for students (grade K-12) and will include an educational native plant garden for propagation of native plants. The proposed improvements include the following: an outdoor landscaped activity area, educational pavilion, dormitory structures, two 2-story residential units used as caretaker residences, off-street parking, driveway, an educational native plant garden, and support infrastructure.

There are no existing drainage systems onsite, but there is an 18-inch culvert that discharges runoff generated mauka of Kamehameha Highway onto the project site. Runoff from the culvert will be routed through the site and appropriate BMPs will be used as required by drainage standards. The post-development drainage pattern will continue to follow pre-development patterns, and runoff will typically sheet flow from the highway across the site through landscaping and into the ocean.

There is no existing municipal wastewater collection system serving the project site. Any existing wastewater systems onsite including cesspools that may have served the previously demolished house should be removed or abandoned. It is anticipated that five separate IWSs will be required to serve the project site. Each IWS will consist of a septic tank and leach field to provide treatment and disposal of wastewater. However, this will need to be verified upon review of wastewater flow projections prior to the design phase.

The proposed water infrastructure on the site will include the installation of a water meter, water service lateral, and service connections to the new buildings. A minimum of four fire hydrants would also have to be installed on the project frontage along Kamehameha Highway in order to provide fire protection to the building facilities onsite and to conform to the Board of Water Supply’s Water System Standards 2002. During the design phase after building footprints have been finalized, review of the UFC shall be conducted to determine if onsite fire hydrants are required. Should onsite fire hydrants be required to conform to the UFC, an additional water meter, fire protection main and an approved onsite fire apparatus access road will also be required.

Table 1, Kāpaeloa Cultural Learning Project Civil Conceptual Cost Estimate, summarizes the conceptual cost estimates for the proposed improvements.
7.0 REFERENCES

City and County of Honolulu, Department of Planning and Permitting, Rules Relating to Storm Drainage Standards, January 2000.


State of Hawai‘i, Department of Transportation, Highways Division, Standards for Access Driveways into State Highways, February 1, 1975.

Table 1. Kāpaeloa Cultural Learning Project Civil Conceptual Cost Estimate

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Notes:
1. Excludes planning, permitting and design services.
2. Excludes permit fees, water, sewer, utility, other system/facilities charges.
3. Excludes electrical, telephone, cable, gas and other utilities.
4. Excludes street improvements.
5. Each IWS includes the cost for the septic tank, leaching chambers, distribution box or manhole, sewer line and soil replacement.
6. Item 10 includes irrigation and temporary cover for the nursery.
Figure 1
Location Map
Figure 3A
Conceptual Plan
Appendix - Topographic Survey of Parcel 1 and Remainder of Kawaiola Beach Park Addition, Uppers at Kapaeloa, Kawaiola, Waialua, Oahu, Hawai‘i, TMK (1)6-1-03: 27, Hawaii Land Consultants, Rev. July 15, 2009
APPENDIX D

Assessment of the Marine Environment

Marine Research Consultants, Inc.

October 2010
I. PURPOSE

Kamehameha Schools is in the preliminary planning stages for future improvements of 6.5 acres of its oceanfront property at Kāpae'ōpua Makai, just southwest of Waimea Bay in Waialua, O'ahu. Ownership of these lands will be maintained by Kamehameha Schools, and the proposed considerations include cultural, educational, and community use. The property is divided into two sectors: the first parcel of approximately 4.26 acres of undeveloped residential-zoned land, known as the Waimea-side parcel is located on the northern end of the property and is adjacent to the 'ili'ohu subdivision. The second shoreline property, separated from the first by existing residential property, includes approximately 1.22 acres of residential-zoned land consisting of five small parcels, and is known as the Hale'iwa-side beachlots (see Figure 1).

There is no a priori reason to indicate that responsible construction and operation of Kāpae'ōpua Makai will cause any detrimental changes to the marine environment. Yet, while all planning and construction activities will place a high priority on maintaining the existing relatively pristine nature of the coastal and marine environments, it is nevertheless important to address any potential impacts that may be associated with the planned project. None of the proposed land uses includes any direct alteration of the coastal shoreline or nearshore marine waters. The potential exists, however, for the project to affect the composition and volume of groundwater that flows beneath the project site, as well as surface runoff emanating from the project. As all groundwater that could be affected by the project subsequently reaches the ocean, it is recognized that there is potential for the project to affect the marine environment. This concern is especially critical for the Kāpae'ōpua Makai area owing to the presently pristine nature of the area which represents a valued recreational resource utilized for surfing, swimming and fishing. Therefore, important questions include the potential impacts from proposed land uses which could cause alterations to water quality and marine life.

In the interest of addressing these concerns and assuring maintenance of environmental quality, a baseline marine environmental assessment and potential impact analysis of the nearshore areas off the Kāpae'ōpua Makai property was conducted in September 2010. The rationale of the assessment was to evaluate the existing composition and condition of the existing marine environment, particularly in terms of water chemistry and coral reef community structure. Results of the evaluation should indicate if, and to what degree, there is the potential for negative effects to the aquatic environments from the proposed project.

II. CHARACTERIZATION OF WATER CHEMISTRY

A. METHODS

Three transect survey sites were established off of the Kāpae'ōpua Makai project site. Transect Site 1 was located at the southern end of property in the approximate center of the Haleiwa-
B. RESULTS

1. Horizontal Stratification

Tables 1 and 2 show results of all water chemistry analyses for samples collected off the K/g407paeloa Makai site in 2010. Table 1 shows concentrations in micrograms per liter (μg/L) and Table 2 shows concentrations in parts per billion (ppb). Concentrations of eight dissolved nutrient constituents in surface and deep ocean samples are plotted as functions of distance from the shoreline in Figure 2. Values for salinity, turbidity, temperature, and Chl a are also plotted as functions of distance from the shore in Figure 3. The salinity, turbidity, temperature, and Chl a values for Table 2 are plotted as functions of distance from shore in Figure 2. Values for salinity, turbidity, temperature, and Chl a are also plotted as functions of distance from the shore in Figure 3. Several patterns of distribution are evident in Figures 1, 2 and 3. Figure 1 shows concentrations of nutrients in surface water samples, while Figure 2 shows concentrations of nutrients in deep ocean samples. The concentration of nutrients decreases with increasing distance from the shore in both the surface and deep ocean samples. Figure 3 shows concentrations of nutrients in surface water samples, while Figure 2 shows concentrations of nutrients in deep ocean samples. The concentration of nutrients decreases with increasing distance from the shore in both the surface and deep ocean samples. Figure 3 shows concentrations of nutrients in surface water samples, while Figure 2 shows concentrations of nutrients in deep ocean samples. The concentration of nutrients decreases with increasing distance from the shore in both the surface and deep ocean samples.
Compared to the patterns of dissolved inorganic nutrients, the distribution of turbidity also displays peaks near the shoreline with decreasing gradients with distance from shore on all three transects. Chl \(a\) displays a somewhat different pattern in that at Transect 3, values increase steadily from the shoreline to a distance of 10 m offshore, followed by a rapid decrease. At Transect sites 1 and 2, values of Chl \(a\) are slightly elevated near the shoreline relative to samples collected beyond 10 m from shore (Table 1, Figure 3).

### Vertical Stratification

Tables 1 and 2 also show concentrations of water chemistry parameters as functions of distance from shore. At Transects 2 and 3, values decrease gradually from the shoreline to a distance of 10 m offshore, similar to the patterns of dissolved inorganic nutrients. The distribution of turbidity also displays peaks near the shoreline with decreasing gradients with distance from shore on all three transects. Chl \(a\) displays a somewhat different pattern in that at Transect 3, values increase steadily from the shoreline to a distance of 10 m offshore, followed by a rapid decrease. At Transect sites 1 and 2, values of Chl \(a\) are slightly elevated near the shoreline relative to samples collected beyond 10 m from shore (Table 1, Figure 3).

In the differences between groundwater signatures at the three transect sites at K/407paeloa Makai, values from the shoreline at Transect site 2 display values of Si and NO\(_3\)- are 2-4 times higher than the shoreline at Transects 1 and 3. This pattern indicates that there is substantially more groundwater input at Transect site 2, which is located immediately adjacent to the K/407paeloa Makai property. However, while there is a detectable difference between surface and deep samples for Si and NO\(_3\)-, TP and TN nutrient concentrations associated with groundwater input (NH\(_4\)+, TON and TOP) do not exhibit any discernible trend with regard to vertical stratification. Likewise, turbidity and Chl \(a\) also showed no consistent trend with regard to vertical stratification. However, values relative to bottom waters were generally higher values relative to bottom waters (Tables 1-2, Figure 3).

### Conservative Mixing Analysis

A useful treatment of water chemistry data for interpreting the extent of material input from land is the application of conservative mixing models. In the simplest form, such a model consists of plotting the concentration of a dissolved chemical species as a function of salinity (Steeh 1979, Smith and Atkinson 1982). The concept of using such mixing models is to scale nutrient concentrations to salinity, which is then used to establish unique sets of water quality standards for the West Coast of the Island of Hawai‘i (Hawaii Administrative Rules §11-54-06).
the pattern for PO$_4$- indicates that there are subsidies of PO$_4$- entering the nearshore environment at all three transect sites from sources other than naturally occurring groundwater from up slope potable wells. Beyond the nearshore area (within 10 m of the shoreline) these subsidies are no longer apparent. The cause of these subsidies to the background concentrations of PO$_4$- is not readily apparent, particularly since there are no corresponding subsidies of NO$_3$.

The other form of dissolved inorganic nitrogen, NH$_4$+, shows a different relationship than Si, NO$_3$ and PO$_4$- . Plots of concentrations of NH$_4$+ versus salinity exhibit no distinct linear trends with respect to salinity (Figure 4). The lack of an inverse relationship suggests that the source of most of the NH$_4$+ in the nearshore ocean is not from land but rather from biological processes occurring in the ocean. The lack of a linear relationship between salinity and NH$_4$+ also is a good indicator that there is little or no input to the ocean from leaching of any sources from land.

5. Compliance with DOH Criteria

DOH Water Quality Standards include specific criteria for three situations; criteria that are not to be exceeded during either 10% or 2% of the time, and criteria that are not to be exceeded by the geometric mean of samples. Comparing sample concentrations to these criteria provide an indication of whether water quality is near the stated specific criteria.

Noted in Tables 1 and 2 are samples that exceed DOH 10% water quality standards for open coastal waters under "wet" (region receives at least 3 million gallons of groundwater input per mile per day) and "dry" (region receives less than 3 million gallons of groundwater input per mile per day) conditions. A comparison of water chemistry results with DOH criteria reveals that during the September 2010 sampling, of the 36 samples measured, 13 measurements of NO$_3$, 11 measurements of NH$_4$+, 6 measurements of TP, 7 measures of TN, and 14 measurements of Chl a exceeded the 10% standards for wet conditions. No measurements of turbidity exceeded the DOH 10% standards for wet conditions.

As discussed above, NO$_3$ is a normal constituent of groundwater, and is also the primary constituent of fertilizer nitrogen that is added to groundwater through leaching of agricultural chemicals. Assuming the concentration of NO$_3$ in the basalt aquifer represents typical groundwater concentrations, it is apparent from the conservative mixing lines in Figure 4 that all nearshore samples will exceed DOH 10% wet criteria at salinities less than approximately 34.9‰, with no further nutrient subsidy from land. All samples in the present data set that exceeded the DOH criteria for NO$_3$ were collected near the shoreline and had salinities less than 33‰ (Tables 1 and 2). Hence, under completely natural conditions, these nearshore ocean samples will exceed DOH limits with no input from any other factors.

Therefore, at the present time, while replicate data sets have not been collected in order to explicitly follow area specific DOH standards, existing baseline conditions of water quality at the Kāpāleao Makai site exceed DOH water quality standards for a variety of constituents. Similar occurrences have recently been documented by Marine Research Consultants at other areas along the coastlines throughout the state, particularly along the west coast of the Island of Hawaii (e.g., O’ma, Puako, Mauna Lani, and Waikoloa). Other investigators also report similar findings at a variety of locations along the length of West Hawaii (R. Brock, personal communication). These consistent findings indicate that exceedance of the existing water quality standards does not necessarily indicate any source of contamination or factors relating to human input. As the Kāpāleao Makai area does not presently contain any significant shoreline or up slope development, it can be implied that the present water quality standards are so stringent that they are can be exceeded under relatively pristine conditions.

III. MARINE BIOTIC COMMUNITIES

A. METHODS

The nearshore marine biotic communities at Kāpāleao Makai consist of a typical north shore Hawaiian coral reef habitat. The intent of the present study was to describe the overall physical and biotic setting to characterize this area of the marine environment. The survey area encompassed approximately 1,900 feet [0.37 mile] of linear coastline, and extended from the shoreline to a water depth of approximately 30 ft (10 m). The resulting characterization is intended to provide an overview of the habitat characteristics of the region in order to provide information that might be of value relating to the future uses of the area. The purpose of the study was not to generate an exhaustive species list of all biota occupying the area.

Biotic composition of the survey area was assessed by divers using SCUBA working from a small boat. Dive surveys were conducted by swimming in a zigzag pattern from the shoreline across the reef to a water depth of 30 feet. These surveys covered a corridor approximately 100 m wide centered on the three transect lines used for water chemistry sampling. During these underwater investigations, notes on species composition were recorded, and numerous digital photographs recorded the existing conditions of the area. The baseline assessment was conducted by S. Dollar, accompanied by C. Conger.

B. RESULTS

1. Physical Structure of the Nearshore Marine Ecosystem

Physical composition of the survey area fronting the Kāpāleao Makai is generally homogenous across the entire length of the project site, with a shoreline composed primarily of large basalt boulders that extend intertidal area (Figure 5). In some areas, patches of coarse calcium carbonate beach sand occur between the landward edge of the boulder shoreline and the vegetation line (Figure 5, bottom). The shallow nearshore region is also composed almost of boulders covered with a short layer of algal turf that extend seaward for a distance of approximately 100 feet (Figures 6 and 7).

Beyond the nearshore boulder zone, bottom composition changes slightly in that the uniform boulder fields grade into a zone of more vertical relief owing to the presence of larger boulders and more irregular rock formation (Figures 8 and 9). Much of this high-relief bottom area is composed of eroded fossil reef formations, some of which occur as undercut ledges
During periods of large swells, which typically occur during the winter months, sand resuspension is undoubtedly far more intense than observed during the present survey. Beyond the area of wave break, resuspension of sand decreased markedly.

2. Reef Community Structure

Composition of the coral reef communities fronting the Kamehameha Schools K/g407paeloa Makai property are in direct...
durgon (humuhumu-hi’u-kole, *M. vidula*) were also observed congregating in the water column over the reef platform. Species of “food fish” (taken by subsistence and/or recreational fishermen) were rarely observed during the survey, although several small jacks (*Caranx melamphygus*) were observed on the outer reef. Orange-eyed surgeonfish (*Ctenochaetus strigosus*), while abundant, were generally not large enough to be considered suitable as “food fish.” Numerous spear fishermen were observed throughout the survey area, which is a likely factor in the paucity of observed fish.

3. Endangered and Protected Species

Several species of marine animals that occur in Hawaiian waters have been declared threatened or endangered by Federal jurisdiction. The threatened green sea turtle (*Chelonia mydas*) occurs commonly throughout the entire Hawaiian Island chain, and turtles are frequently observed on beaches and nearshore reefs throughout the North Shore area (Figure 11). The endangered hawksbill turtle (*Eretmochelys imbricata*) is known infrequently from waters off the north shore. Populations of the endangered humpback whale (*Megaptera novaeangliae*) winter in the Hawaiian Islands from December to April. The present survey was conducted in September, when whales are not present in Hawaiian waters. However, the scope of the survey was restricted to the waters closer to shore, and the survey was conducted in the areas where humpback whales are known to frequent. The Hawaiian monk seal (*Monachus schauinslandi*), an endangered earless seal, is endemic to the waters off the Hawaiian Islands. Monk seals commonly haul out of the water onto sandy beaches to rest. Hence, while there are limited sandy beaches along the K/g407paeloa Makai property shoreline, there is a probability that seals will haul out on these beaches. Should there be any physical factors that will result in modification of the shoreline, there are no plans for any modification of the seal behavior.

VI. DISCUSSION and CONCLUSIONS

The purpose of this assessment is to assemble the information to make valid evaluations of the potential for impact to the marine environment from the proposed improvements to the Kamehameha Schools K/g407paeloa project. The assessment does not address any modification of the shoreline or the procurement of property. There are no plans for any modification of the seal behavior. There are several concerns that should be addressed in the planning process for the future project. These concerns include the potential for impact to the marine environment, the potential for impact to the marine environment, and the potential for impact to the marine environment. The potential for impact to the marine environment is significant and must be addressed in the planning process for the future project.
During periods of typical winter surf that occurs seasonally, it is likely that mixing forces are strong enough to prevent any detectable stratification of nutrient concentrations throughout the nearshore zone.

3. Water chemistry constituents that are not major components of groundwater (NH$\text{}_4^+$, DON, DOP) also displayed distinct gradients with respect to distance from the shoreline. Chl a and turbidity were generally elevated in nearshore samples with decreasing values moving seaward.

4. Application of a hydrographic mixing model to the water chemistry data was used to indicate if increased nutrient concentrations in nearshore waters are the result of mixing of natural groundwater with oceanic water, or are the result of inputs from activities on land. The model indicates that at the time of sampling there were no external subsidies of NO$_3^-$ nitrogen to the ocean at any of the ocean transect sites, indicating that the observed horizontal gradients are the result of natural processes of mixing of groundwater and ocean water. There were, however, apparent subsidies of phosphate phosphorus that may not be from natural sources.

5. Evaluating water chemistry from the single sampling in September 2010 using DOH water quality standards indicates many of the measurements, especially in the nearshore zone, exceed the standard criteria. Evaluating water chemistry data using the mixing criteria indicates that natural groundwater will result in exceedance of water quality standards at salinities below 34.5‰. All of the samples with exceedances for concentrations of NO$_3^-$ had salinities below 34.5‰, suggesting that there may be no influence from human activities on land causing the observed values that are above DOH limits.

6. Characterization of the existing marine communities was carried out using rapid assessment techniques. The physical structure of the offshore area is characterized by a nearshore zone of basaltic boulders; further offshore the boulders grade into an irregular structure of eroded limestone structures. Beyond the high-relief area, bottom structure consists of rounded knolls of fossilized reef platform that grade into a sand plain.

7. The extreme energy conditions created by seasonal large breaking waves from storms in the North Pacific regulate biotic composition of the nearshore area. In sum, biotic resources, in terms of both species and growth forms, are restricted to only the most stress resistant species that are able to withstand the rigors of breaking waves and extreme sediment scour. Overall coral cover in the area was no more than about 5-10% of bottom cover, with most areas of hard bottom beyond the surf zone occupied with healthy but limited corals. Algal communities were limited mainly to encrusting calcareous species, with no observations of extensive frondose algae (including invasive species) within the survey area. Reef fish in the area also appeared typical of high energy wave-stressed areas, although there was a definite paucity of fish that are preferentially targeted as food species.

10. Overall, results of the marine assessment of the Kamehameha Schools Kāpaaoloa Makai project area indicate that water chemistry analysis and marine biotic communities are controlled primarily by physical forces associated with large surf that occurs seasonally. With the exception of fishing pressure, the area appears largely unaffected by human activities on land. The planned maintenance and improvements to the area planned by Kamehameha Schools should not change water quality of the offshore marine area to any discernible extent.

11. The studies conducted for this report, particularly the water quality analyses, can serve as an initial baseline for any monitoring programs that may be required for any projected changes to land uses at Kāpaaoloa Makai.
REFERENCES CITED


FIGURE 1. Aerial photograph of section of north shore of Oahu southwest of Waimea Bay showing boundaries of two parcels of Kamehameha Schools Kapaeula project site (Haleiwa-side Beach lots and Waimea-side parcel). Also shown are locations of three water sampling transects that extend from the shoreline to approximately 200 meters offshore.
Table 1. Water chemistry measurements from three ocean water transects and a groundwater well collected in the vicinity of the Kamehameha Schools Kapalama wa`a project site in Waialua, Oahu, collected on 19-20, 2010. Alkalinity as follows: DSS-distance from shore, S=surfacer, D=Deep; BDL=below detection limit. Also shown are the State of Hawaii, Department of Health (DOH) “not to exceed more than 80% of the time” and “not to exceed more than 2% of the time” water quality standards for open coastal waters under “dry” and “wet” conditions. Based values exceed DOH “dry” standards, based and shaded values exceed DOH “wet” standards. For sampling site locations, see Figure 1.

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Table 2. Water chemistry measurements (μg/L) from three ocean water transects and a groundwater well collected in the vicinity of the Kamehameha Schools Kapalama wa`a project site on September 18, 2010. Alkalinity as follows: DSS-distance from shore, S=surfacer, D=Deep; BDL=below detection limit. Also shown are the State of Hawaii, Department of Health (DOH) “not to exceed more than 80% of the time” and “not to exceed more than 2% of the time” water quality standards for open coastal waters under “dry” and “wet” conditions. Based values exceed DOH “dry” standards, based and shaded values exceed DOH “wet” standards. For sampling site locations, see Figure 1.

**Note:** This document contains tables and figures that are not fully transcribed or accurately rendered in the natural text format. For a comprehensive understanding, please refer to the original document or consult the appropriate sections for detailed information.
FIGURE 2. Plots of dissolved nutrients in surface (S) and deep (D) samples collected on September 18, 2010 along three transects in the vicinity of the Kamehameha Schools Kapaeloa project site as a function of distance from the shoreline. For transect locations, see Figure 1.

FIGURE 3. Plots of water chemistry constituents in surface (S) and deep (D) samples collected on September 18, 2010 along three transects in the vicinity of the Kamehameha Schools Kapaeloa project site as a function of distance from the shoreline. For transect locations, see Figure 1.
FIGURE 4. Mixing diagram showing concentration of dissolved nutrients from samples collected on September 18, 2010 along three transects in the vicinity of the Kamehameha Schools Kapaeloa project site. Straight lines in each plot are conservative mixing lines constructed by connecting the concentrations in open ocean water with water from a groundwater well upslope of the sampling area. For transect locations, see Figure 1.

FIGURE 5. Views of the rocky shorelines looking southwest from southern corner of the Waimea-side parcel toward the Haleiwa Beach Lots (top), and from the northern corner of the Waimea-side parcel (bottom) of the Lands of Kamehameha Schools Kapaeloa Makai project site in Wai'anae, O'ahu, Hawaii.
FIGURE 6. Views of the boulder-covered bottom in nearshore zone off Lands of Kamehameha Schools Kāpealao Makai project site in Waialua, O’ahu, Hawai’i. Coral colonies growing on boulders are primarily of two species, *Pocillopora meandrina* which occur as round colonies with stubby branches, and *Montipora flabellata* which occurs as flat encrustations. Water depth is approximately 10 feet.

FIGURE 7. Views of the boulder-covered bottom in nearshore zone off Lands of Kamehameha Schools Kāpealao Makai project site in Waialua, O’ahu, Hawai’i. Coral colonies growing on boulders are primarily of two species, *Pocillopora meandrina* which occur as round colonies with stubby branches, and *Montipora flabellata* which occurs as flat encrustations. Water depth is approximately 10 feet.
FIGURE 8. Large boulder colonized by corals, predominantly of the species *Pocillopora meandrina* offshore of Lands of Kamehameha Schools Kāpealoha Makai project site in Waialua, O'ahu (top), Hawaii. Bottom photo shows small green sea turtle (*Chelonia mydas*) resting under edge of limestone finger that extends from the reef bench to the offshore sand plain. Water depth is approximately 25 feet.

FIGURE 9. Views of the limestone plates beyond boulder zone offshore of Lands of Kamehameha Schools Kāpealoha Makai project site in Waialua, O'ahu, Hawaii. Coral colonies growing on boulders are primarily of two species, *Pocillopora meandrina* which occur as round colonies with stubby branches, and *Montipora flabellata* which occurs as flat encrustations. Water depth is approximately 20 feet.
FIGURE 10. Sections of eroded fossil reef limestone platforms forming irregular shaped features offshore of Lands of Kamehameha Schools Kāpealoha Makai project site in Waialua, O‘ahu (top), Hawaii. Water depth is approximately 20 feet.

FIGURE 11. Edges of fossil limestone reef platforms at junctures of sand plains at outer edge of reefs offshore of Lands of Kamehameha Schools Kāpealoha Makai project site in Waialua, O‘ahu, Hawaii. Bottom photo shows small green sea turtle (*Chelonia mydas*) resting under edge of limestone finger that extends from the reef bench to the offshore sand plain. Water depth is approximately 25 feet.
FIGURE 12. Edge of reef platform intersecting sand plain (top), and boulder field on sand plain (bottom) at seaward edge of fossil reef platform offshore of Lands of Kamehameha Schools Kāpealoa Makai project site in Waialua, O‘ahu (top), Hawaii. Water depth is approximately 25 feet.

FIGURE 13. Photos of resuspension of sand by wave energy in nearshore reef zone off of Lands of Kamehameha Schools Kāpealoa Makai project site in Waialua, O‘ahu, Hawaii. These photos were taken on a day with only a very small northerly swell; on days experiencing typical winter surf, resuspension of sand will be substantially greater.
APPENDIX E

Archaeological Inventory Survey

Cultural Surveys Hawaii, Inc.

May 2011
DRAFT

Archaeological Inventory Survey for the Kāpaeloa Cultural Learning Project, Kawaiola Ahupua’a, Waialua District, O‘ahu

TMK: [1] 6-1-003: 056 por.

Prepared for
Group 70 International, Inc.

Prepared by
Jon Tulchin, B.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: KAWAILOA 1)

May 2011

Management Summary


Date
May 2011

Project Number (s)
Cultural Surveys Hawai‘i Inc. (CSH) Project Number: KAWAILOA 1

Investigation Permit Number
Fieldwork in this report has been performed under CSH’s annual archaeological research permit, No. 10-10, issued by DLNR / SHPD.

Project Location
The project area consists of parcel located along the northwestern coast of O‘ahu. It comprises TMK: [1] 6-1-003: 056 por., which is bounded by Kamehameha Highway to the east, the Pacific Ocean to the west, and Waimea Bay to the north. This area is depicted on the 1998 Waima USGS 7.5-minute topographic quadrangle.

Land Jurisdiction
Private, B. P. Bishop Estate Trust

Agencies
State of Hawai‘i Department of Land and Natural Resources / State Historic Preservation Division (DLNR / SHPD)

Project Description
The Kamehameha Schools Kapaeloa Cultural Learning Project will include an outdoor activity lawn, an educational pavilion, dormitory structures (up to 3,000 SF), two caretaker residences, an educational native plants garden, off-street parking, and support infrastructure. The primary use will be a school facility for school age children (grades K-12) enrolled in Kamehameha Schools programs. Associated ground disturbance will include excavation related to structural footings, utility installation, roadway and parking area installation, and landscaping.

Project Acreage
3.48 acres

Area of Potential Effect (APE) and Survey Acreage
Based on available information, the proposed development project will not impose adverse visual, auditory or other environmental impact to any known historic properties, including standing architecture, located outside the project area. Accordingly, the proposed project, based on available information lacks potential to affect historic properties outside the project area. As a result the project’s APE is the same as the project area. The survey area for the current investigation included the entire approximately 3.48 acres of land proposed for redevelopment, all of which constitute the APE/project area.

Historic Preservation Regulatory Context
At the request of Group 70 International Inc., CSH undertook this archaeological inventory survey. In consultation with SHPD, this inventory survey investigation was designed to fulfill the state requirements for archaeological inventory surveys [Hawai‘i Administrative Rules (HAR) Chapter 13-276]. This document was prepared to support the proposed project’s historic preservation review under Hawai‘i’s Revised Statutes (HRS) Chapter 6E-42 and HAR Chapter 13-284.
### Fieldwork Effort
Jon Tulchin, B.A., Nifae Hunkin, B.A., Trevor Yucha, B.A., and Kulani Jones, B.S. assisted project director Douglas Borthwick, B.A., with the field effort, which required 14 person-days to complete. Fieldwork took place between October 1st and October 11th 2010 under the general supervision of Hallett H. Hammatt, Ph.D. (principal investigator).

### Number of Historic Properties Identified
| Historic Properties Recommended Eligible to the Hawai'i Register of Historic Places (Hawai'i Register) | 3 (3) |

### Historic Properties Recommended Ineligible to the Hawai'i Register
None

### Effect Recommendation
CSH’s project specific effect recommendation is “effect, with proposed mitigation commitments.” The recommended mitigation measures will reduce the project’s effect on yet to be identified subsurface historic properties that may be located within the project area and be pro-active in addressing possible community concerns.

### Mitigation Recommendation
Previous archaeological investigations have identified numerous pre-contact historic properties in the immediate vicinity of the project area including: heiau, a fishing shrine, sacred stone, subsurface cultural deposits (midden & artifacts), and platforms (McAllister 1933; Athens & Shun 1982). Previous archaeological investigations have also identified post-contact historic properties in the vicinity of the project area primarily associated with OR&L railroad infrastructure (bridges, railroad beds, etc.). The current investigation identified two post-contact habitation sites (SIHP -7144 & -7145) and a remnant of the O.R. & L. railroad berm. Thus it is very likely that subsurface historic properties, associated with both pre- and post-contact land use, are present within the project area in the form of cultural layers and/or structural remnants buried by modern and/or historic fill layers. In order to mitigate the potential damage to these potential historic properties within the project area, it is recommended that project construction proceed under an archaeological monitoring program. The specifics of this monitoring program will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project’s non-burial archaeological deposits, should any be discovered.

No further historic preservation work is recommended for SIHP #’s 50-80-01-2489, 50-80-01-7144, and 50-80-01-7145. Sufficient information regarding the location, function, age, and construction methods of these historic properties has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities.
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Archaeological Inventory Survey for the Kipuakea Cultural Learning Project at Kawailoa Ahupu‘a

Archaeological Inventory Survey for the Kipuakea Cultural Learning Project at Kawailoa Ahupu‘a
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Section 1  Introduction

1.1 Project Background

At the request of Group 70 International, Inc., Cultural Surveys Hawaii, Inc. (CSH) conducted an archaeological inventory survey of an approximately 3.48-acre project area in the ahupua‘a of Kawailoa, Waimea District, Island of O‘ahu. The project area consists of parcel located along the northwestern coast of O‘ahu. It comprises TMK: [1] 6-1-003: 056 por., which is bounded by Kamehameha Highway to the east, the Pacific Ocean to the west, and Waimea Bay to the north. This area is depicted on the 1998 Waimea USGS 7.5-minute topographic quadrangle, a Tax Map Key, and an aerial photograph (Figure 1, Figure 2, & Figure 3).

The Kamehameha Schools Kapaeloa Cultural Learning Project will include an outdoor activity lawn, an educational pavilion, dormitory structures (up to 3,000 SF), two caretaker residences, an educational native plants garden, off-street parking, and support infrastructure. The primary use will be a school facility for school age children (grades K-12) enrolled in Kamehameha Schools programs (Figure 4). Associated ground disturbance will include excavation related to structural footings, utility installation, roadway and parking area installation, and landscaping.

Based on available information, the proposed development project will not impose adverse visual, auditory or other environmental impact to any known historic properties, including standing architecture, located outside the project area. Accordingly, the proposed project, based on available information lacks potential to affect historic properties outside the project area. As a result the project’s APE is the same as the project area. The survey area for the current investigation included the entire approximately 3.48 acres of land proposed for redevelopment, all of which constitute the APE/project area.

1.2 Historic Preservation Regulatory Context and Document Purpose

As a privately funded venture on private lands, the proposed redevelopment is a “project” subject to state of Hawai‘i historic preservation review legislation (Hawaii Revised Statutes [HRS] Chapter 6E-42 and Hawai‘i Administrative Rules [HAR] Chapter 13-284). Based on the project’s scope, cultural setting, and the results of previous cultural resource management investigations in the vicinity, Group 70 International, Inc. had this archaeological inventory survey investigation completed. With its extensive subsurface testing program, this investigation was carried out as part of and in compliance with the proposed development’s historic preservation review.

Under Hawai‘i state historic preservation legislation, archaeological inventory surveys are designed to identify, document, and provide significance and mitigation recommendations for historic properties (HAR Chapter 13-284). Under this legislation, historic properties are defined as...
Archaeological Inventory Survey for the Kāpūlea Cultural Learning Project at Kawaiola Ahupua'a

Figure 1. Aerial photograph showing the location of the project area (source: Google Earth 2010)

Figure 2. Tax Map Key [1] 6-1-003, showing the location of the project area

Introduction

Figure 3. Aerial photograph showing the location of the project area (source: Google Earth 2010)
as any “building, structure, object, district, area, or site, including heiau and underwater site, which is over fifty years old.” A project’s effect and potential mitigation measures are evaluated based on the project’s potential impact to “significant” historic properties (those historic properties determined eligible, based on established significance criteria, for inclusion in the Hawai‘i Register of Historic Places [Hawaii’s Register]). Determinations of eligibility to the Hawai‘i Register result when a state agency official’s historic property “significance assessment” is approved by the State Historic Preservation Division (SHPD), or when SHPD itself makes an eligibility determination for an historic property.

1.3 Scope of Work

The following archaeological inventory survey scope of work is designed to satisfy the Hawai‘i state requirements for archaeological inventory surveys (HAR Chapter 13-276):

1. Historic and archaeological background research, including a search of historic maps, written records, Land Commission Award documents, and the reports from prior archaeological investigations. This research will focus on the specific project area’s past land use, with general background on the pre-contact and historic settlement patterns of the ahu‘pua‘a and district. This background information will be used to compile a predictive model for the types and locations of historic properties that could be expected within the project area.

2. A ground survey of the entire project area for the purpose of historic property identification and documentation. All historic properties would be located, described, and mapped with evaluation of function, interrelationships, and significance. Documentation will include photographs and scale drawings of selected historic properties. All historic properties will be assigned Inventory of Historic Properties numbers by the State and located with a Trimble GPS. This GPS data will be in the report in ArcGIS format and be sufficient for planning purposes.

3. Based on the project area’s environment and the results of the background research, subsurface testing with a combination of hand and backhoe excavation was conducted. Subsurface testing focused on locating and evaluating subsurface deposits, such as buried cultural layers and/or deposits with significant paleoenvironmental data, which could not be located by the ground survey. Testing in sensitive areas was conducted by hand after the initial backhoe work. If appropriate samples from these excavations are found, they will be analyzed for chronological and paleoenvironmental information. All subsurface historic properties identified will be documented to the extent possible, including geographic extent, content, function/derivation, age, interrelationships, and significance.

4. Preparation of a survey report which will include the following:
   a. A topographic map of the survey area showing all historic properties;
   b. Results of consultation with knowledgeable community members about the property’s past land use and historic properties.
Introduction

Archaeological Inventory Survey for the /g46/g407/g83/g68/g72/g79/g82/g68/g3/g38/g88/g79/g87/g88/g85/g68/g79/g3/g47/g72/g68/g85/g81/g76/g81/g74/g3/g51/g85/g82/g77/g72/g70/g87
at Kawailoa Ahupua'a

This scope of work also includes full coordination with SHPD and the City and County of Honolulu relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

1.4 Environmental Setting

1.4.1 Natural Environment

The project area is located along the northwestern coastline of the island of O'ahu. It is located approximately 280 m (0.2 miles) southwest of Waimea Bay, and approximately 1300 m (0.8 miles) northeast of Kawailoa Beach. Lands within the project area are level with an elevation of 1-10 m (3-30 ft.) a.m.s.l.

According to U.S. Department of Agricultural (USDA) soil survey data (Foote et al. 1972) the sediments within the project area consist of Waialua Stony Silty Clay (WIB) and Kaena Very Stony Clay (KanE) (Figure 5). Soils of the Waialua series consist of “moderately well drained soils on alluvial fans...developed in alluvium weathered from basic igneous rock...used for sugarcane, truck crops, orchards, and pasture” (Foote et al. 1972). Soils of the Kaena series consist of “very deep, poorly drained soils on alluvial fans and talus slopes...developed in alluvium and colluvium from basic igneous material...used for sugarcane, truck crops, pasture, and homesites” (Foote et al. 1972).

The project area receives between 1000 millimeters (39 inches) and 1500 millimeters (59 inches) of annual rainfall (Giambelluca et al. 1986). Vegetation consists of koa haole (Leucaena leucocephala) banyan trees (Ficus benghalensis), coconut trees (Cocos nucifera), and exotic grasses.

1.4.2 Built Environment

A majority of the project area is undeveloped with a few residential dwellings located within the southwestern portion of the project area. Grading and subsurface utilities are present in the vicinity of the residential dwellings.

Figure 5. Overlay of Soil Survey of the State of Hawai‘i (Foote et al. 1972), indicating sediment types within the project area
Section 2   Methods

2.1 Field Methods

Nifae Hunkin, B.A., and Kulani Jones, B.S., assisted project director Jon Tulchin, B.A., with the field effort, which required 12 person-days to complete. Fieldwork took place between October 1 and October 15th 2010 under the general supervision of Hallett H. Hammatt, Ph.D. Fieldwork consisted of a 100% ground survey of the project area. Following the pedestrian inspection, the historic property identification effort focused on a subsurface testing program. 14 test trenches were excavated, documented, and sampled.

2.1.1 Pedestrian Inspection

A complete ground survey of the project area was undertaken for the purpose of historic property identification and documentation. The ground survey of the project area was accomplished through systematic sweeps. The interval between the archaeologists was generally between 5-10 m. All historic properties were documented through detailed written description, with evaluation of function, interrelationships, and significance; photographs; scale drawings using standard tape-and-compas mapping procedures; and located with Trimble ProXH GPS survey equipment (sub-foot accuracy).

2.1.2 Ground Penetrating Radar Survey

2.1.2.1 Survey Methodology

The GPR survey was performed using a Geophysical Survey Systems, Inc. (GSSI) SIR-3000 system equipped with 400 MHz antenna. This is a bistatic system, in which electromagnetic energy in the radar frequency range is transmitted into the ground via a sending antenna. Radar energy is reflected off of the subsurface matrix and is then received by another, paired antenna. Reflected energy is sampled and the travel time (in nanoseconds) of the individual reflection is recorded. Wave propagation speed varies depending on the nature of the subsurface medium. Any changes in density or electromagnetic properties within the stratigraphic column may cause observable variations in reflection intensity. Reflection features may include discrete objects, stratigraphic layering, or other subsurface anomalies.

The GPR survey was conducted using single-run transects to generate two-dimensional (2D) depth profiles and horizontal depth slices (i.e. plan view maps of subsurface anomalies at selected depths below the surface). GPR data collection parameters (Table 1) were held constant throughout the survey under the assumption that soil conditions were relatively consistent across the survey area. A dielectric constant of 8 was utilized in anticipation of the presence of sand throughout the survey under the assumption that soil conditions were relatively consistent across the survey area. A dielectric constant of 8 was utilized in anticipation of the presence of sand within the project area based on the USGS soil survey of the area (Foote et al. 1972).

The effectiveness of GPR is highly dependent on local soil conditions. The high signal attenuation rate of many soil types restricts the depth of radar penetration and therefore limits the effectiveness of GPR surveys. The National Resource Conservation Service (NRCS) produced maps indicating the relative suitability of GPR for the U.S. The GPR suitability data was generated based on U.S. Department of Agriculture (USDA) soil survey data. Figure 6 shows the GPR survey area on the NRCS GPR Suitability Map for Hawaii. The survey area is shown to primarily traverse lands in the very low suitability category. This is likely due to the survey area’s proximity to salt water (i.e., the ocean), as both salt and water increase the conductivity of the soils causing limited depth “visibility” and inaccurate data collection. Additionally, the presence of very stony sediments within the project area (see Section 1.4 above; Foote et al. 1972) could obscure more ephemeral anomalies associated with cultural deposits.

2.1.2.2 Post-processing

All collected radar data was post-processed using the following software: RADAN 6.6, GPR Process, and Surfer 9. Position correction was utilized to remove unwanted surface “noise” from GPR profiles. A Horizontal High Pass Finite Impulse Response “Boxcar” (Background Removal) filter was not utilized in order to retain the image of recorded stratigraphic layers. Horizontal slicing of GPR data was conducted utilizing 25 cm depth intervals. Horizontal slices were not generated for portions of GPR data that was distorted and/or attenuated due to environmental conditions and disturbances. In general, useful GPR data collected for the current study was located between 0 and 100 cmbs.

2.1.3 Subsurface Testing

The subsurface testing program consisted of the excavation of 14 trenches. Trenches were excavated to assess the stratigraphy and potential for subsurface cultural deposits within the archaeological inventory survey area.

Table 1. GPR Data Collection Parameters

<table>
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<th>Settings</th>
</tr>
</thead>
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<td>Antenna</td>
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<tr>
<td>Samples per Scan</td>
<td>512</td>
</tr>
<tr>
<td>Format</td>
<td>16-bit</td>
</tr>
<tr>
<td>Depth</td>
<td>2 meters</td>
</tr>
<tr>
<td>Dielectric</td>
<td>8</td>
</tr>
<tr>
<td>Soil</td>
<td>Type 2</td>
</tr>
<tr>
<td>Scans per Unit</td>
<td>50/m</td>
</tr>
</tbody>
</table>

The measure of the ability of a material to store a charge from an applied electromagnetic field and then transmit that energy. In general, the greater the dielectric constant of a material, the slower radar energy will move through it. The dielectric constant is a measurement of how well radar energy will be transmitted to depth.
A standard backhoe with a two-foot wide bucket was used to excavate each test trench. Generally, trenches excavated to assess subsurface stratigraphy and prospect for subsurface cultural deposits were approximately 6 m long, 1 m wide, and between 1 to 2 m deep. When possible trenches were excavated down to underlying bedrock or below the water table.

The stratigraphy in each trench was drawn and photographed. The sediments were described for each of the trenches using standard USDA soil description observations/terminology. Sediment descriptions include Munsell color, texture, consistency, structure, plasticity, cementation, origin of sediments, descriptions of any inclusions such as cultural material and/or roots and rootlets, lower boundary distinctiveness and topography, and other general observations.

2.1.4 Backfilling of Trenches
Following all documentation and sampling each trench was backfilled.

2.2 Document Review
Background research included: a review of previous archaeological studies on file at SHPD; review of documents at Hamilton Library of the University of Hawai‘i, the Hawai‘i State Archives, the Mission Houses Museum Library, the Hawai‘i Public Library, and the Archives of the Bishop Museum; study of historic photographs at the Hawai‘i State Archives and the Archives of the Bishop Museum; and study of historic maps at the Survey Office of the Department of Land and Natural Resources. Historic maps and photographs from the CSH database (<www.waihona.com>) were also consulted. In addition, Māhele records were examined from the Waihona ‘Aina database (<www.waihona.com>).

This research provided the environmental, cultural, historic, and archaeological background for the project area. The sources studied were used to formulate a predictive model regarding the expected types and locations of historic properties in the project area.
Background Research

TMK: [1] 6-1-003: 056 por.

Archaeological Inventory Survey for the .ƗSDHORD&XOWXUDO/HDUQLQJ3URMHFW at Kawailoa Ahupua‘a

Waialua, on its seaward slopes, was as generously endowed with water as any
area on Oahu. Much of the gently sloping and level land was formerly covered
with wet-taro terraces. And beyond there was a great spread of kula land with red
soil which was ideal terrain for sweet potato planting. The Wai‘anae range gave
this area a rich hinterland. Waialua had a fine bay with a broad beach, and there
were several fishponds...Altogether this was the most bounteously endowed area
on the sunset coast [of O‘ahu] (Handy and Handy 1972:466-7).

13

The Waialua district’s material abundance would have made it a focus of population and ali‘i
residence:

For the 28 generations from Hulihonua [the first man in the ancient Hawaiian
past] to Wakea, no man was made chief over another. During the 25 generations
from Wakea to Kapawa, various noted deeds are mentioned in the traditions and
well-known stories. Kapawa was the first chief to be set up as a ruling chief. This
was at Waialua, Oahu; and from then on, the group of Hawaiian Islands became
established as chief-ruled kingdoms...(Kamakau 1964:3).

The significance of the district of Waialua and the ahupua‘a of Kawailoa in the consciousness
of native Hawaiians are suggested in the numerous traditions associated with the district and
ahupua‘a. Samuel Kamakau, the pioneering 19th-century Hawaiian historian who was himself
born in Waialua, identifies the district as the site of a significant event in the consolidation of
chiefly power in the islands:

3.1.1 Pre-Contact to 1800

3.1 Traditional and Historical Background

Clues to the history of land use and activity within the ahupua‘a, and the project area, are
found in preserved records, including journals, government records, scholarly studies, memoirs,
archaeological studies, maps, historic photographs, and oral histories. The earliest records
present glimpses of landmarks and events within Kawailoa and the Waialua district; however, by
the middle decades of the 19th century, it is possible to focus more precisely on the project area
as documentation becomes more abundant and specific.

The project area is located within the ahupua‘a of Kawailoa (“the long water” [Pukui et al.
1974]) in the district of Waialua on the northern side of O‘ahu (see Figure 1, Figure 2, & Figure
3). This traditional land unit is bordered by the ahupua‘a of Waimea to the northeast, the
ahupua‘a of Pa‘ala‘a to the southwest, the Ko‘olau Range to the east, and the ocean to the
northwest. From the Ko‘olau Mountains, Kawailoa extends down slope with the southern
ERXQGDU\ DW µƿSDHµXOD 6WUHDP DQG WKH QRUWKHDVWHUQ ERXQGDU\ DORQJ WKH ULGJH EHWZHen
Kamananui and Kaiwiko‘ele Streams.

Section 3 Background Research

Cultural Surveys Hawai‘i Job Code: KAWAILOA 1

Background Research

TMK: [1] 6-1-003: 056 por.

Archaeological Inventory Survey for the .ƗSDHORD&XOWXUDO/HDUQLQJ3URMHFW at Kawailoa Ahupua‘a

14

Trade in sandalwood was the strict monopoly of the ali‘i beginning with Kamehameha. At the
height of the sandalwood boom, Kamehameha was buying foreign ships, including six vessels
between 1816 and 1818, to transport his own wood to the Orient (Kuykendall 1965:87). When
Kamehameha bought the schooner Columbia in 1817, it was paid for with sandalwood from
Kaua‘i and from the districts of Waimea and Wai‘anae on O‘ahu (Kuykendall 1965:88). Peter
Corney, the chief officer on the Columbia, describes the prodigious operations the sandalwood

The Hawaiian Islands began exporting sandalwood to the Orient shortly after 1800 and the
commerce flourished until the supply dwindled in the mid-1830's. Waialua was a region of
importance in the sandalwood trade. The demands put on the PDNDµƗLQDQD (commoners) to
harvest wood for trade caused many fields to become fallow and unused.

3.1.2 1800 to 1850

,Q.DµHRNǌODQLUHFUXLWHGWKHZDUULRUVRI:DLDOXDDQG:DLµDQDHWRPDNHZDURQKLV
QHSKHZ.DODQLNǌSXOHWKHQUXOHURI2µDKX .DPDNDX E\'HFHPEHU.DµHRKDG
EHHQNLOOHGDQGKLVIRUFHVZHUHGHIHDWHG.DODQLNǌSXOHZRXOGKLPVHOIEHGHSRVHG the following
year when the invading Hawai‘i Island forces of Kamehameha prevailed at the Battle of Nu‘uanu
in April 1795. Apparently the Waialua District was spared direct involvement in the battles
associated with Kamehameha’s conquest. However, Kamehameha’s hegemony on O‘ahu would
have immediate consequences for the district during the first decades of the 19th century.

Samuel Kamakau records that Kawailoa also figured in the fate of Hu‘eu, one of Kahekili’s
Maui chiefs, who had been installed at Waialua. While Kahekili and the other Maui chiefs had
been warned of the O‘ahu chiefs plot, and escaped, "Hu‘eu, who was living at Ka‘owakawaka,
Kawailoa, in Waialua, was killed on one of the Kaloa nights while his guards were asleep"

The place became known as Kahakakau Kanaka. As the odor came to the sands at
Haleiwa they became known as Maeaea; the point on the other side became
known as Kupava. (McAllister 1933:141-142)

Further evidence of the importance of the ahupua‘a of Kawailoa and events occurring there is
revealed in the recounting of the fate of the O‘ahu Chief Elani. In 1783, forces of the Maui Chief
Kahekili gained control of O‘ahu by defeating the island's PǀµƯ Kahahana. Kahekili, following
an unsuccessful rebellion against the Maui invaders, killed Elani father of Kahahana, and other
O‘ahu chiefs. Elani’s body was left to decompose on a ledge at Pua‘ena Point, approximately
three miles to the southwest of the present project area:

The presence of no less than eleven temples, several of luakini class and therefore
associated with ruling chiefs, testifies to the importance of these lands to the
Hawaiian chiefs. The political importance of the district, of course, was grounded
in the system of agricultural and aquacultural production, notably the extensive
taro irrigation complexes and ‘Uko‘a and Loko‘ea fishponds (Kirch and Sahlins

Cultural Surveys Hawai‘i Job Code: KAWAILOA 1


Waialua’s famous fish ponds seem to have declined thereafter, the benefits falling more to the Ka'ahumanu lords of the land, and the de fact control to the resident chiefs Pi‘ia and La‘anui, who were able to integrate these lands into their ahu‘ala. With this consolidation, Kawailoa replaced Kamananui as the Ke‘elau ahu‘ala, and La‘anui’s 1832 ʻahu‘ala was to remain the chiefly ʻahu‘ala through the end of the 19th century. Though Waialua’s chief, La‘anui, was living at Kawailoa in 1832 (Namahana had died in 1829), when the Rev. John S. Emerson (1806-1867) came to Waialua, he could only find a man to welcome us. We sat down on the floor packed together as close as possible, but a great many were still compelled to sit down on the floor packed together as close as possible, but a great many people who were bungling or bungling, thought my father, Dr. Judd, who had been in the country four years longer than he, began to ask questions, and found that La‘anui has not completed the construction of the new church at Waialua, and that the services were not very good, he did not force his people to attend church in that way... (Emerson 1828:55).

After the Sabbath we examined and encouraged, and partially supplied with books, the incipient schools established there under the particular patronage of Lydia Namahana and Gideon La‘anui, to whom the district belonged. There were more than 200 children employed in bringing off, day and night (Corney 1889:80-90). The new [meeting] house [at Waialua] was opened for the first time for dedication on September 25th, 1833, and Dr. Judd, Mr. Bingham and Mr. Brinsmade, a merchant, came from Honolulu for the occasion. When they got to the meeting with any of the crowd of people standing, he ordered them to sit down on the floor packed together as close as possible, but a great many people who were bungling or bungling, thought my father, Dr. Judd, who had been in the country four years longer than he, began to ask questions, and found that La‘anui has not completed the construction of the new church at Waialua, and that the services were not very good, he did not force his people to attend church in that way... (Emerson 1828:55).

It is possible to estimate the population comprising “everyone in the entire district of Ka‘ahumanu” in 1819, when the Rev. John S. Emerson arrived in Waialua. This population was estimated at 2,640, which comprised only 8.8% of the entire island population of 29,742 (Schmitt 1977:12). By the census of 1835-1836, the Waialua population had dropped to 2,415, comprising 8.6% of the O‘ahu Island population of 27,798. This decline was due in part to the beginning in 1831 of western contact. During the first census of O‘ahu Island in 1831-1832, a total population of 5,377 was recorded for the district of Kawailoa, it appears that this population was comprised of only the residents of Waialua. However, as Sahlins (1992) points out, this population was part of a larger administrative unit of Kawailoa. The census of 1835-1836, which was conducted by Dr. Judd, Mr. Bingham, and Mr. Brinsmade, found a total population of 2,640, which comprised only 8.8% of the entire island population of 29,742. Schmitt (1977:12) notes that the population of 2,415, comprising 8.6% of the O‘ahu Island population of 27,798, was recorded in the Waialua District in 1835-1836.

Though the population of Waialua had dropped to 2,415 by the census of 1835-1836, the Waialua population was still the political center of Waialua, as Sahlins (1992:95) points out, that “these lands were part of and administered from the Ka‘ahumanu ʻahu‘ala, which was still the political center of Waialua” (Sahlins 1992:95). As Emerson (1828:55) states, “we found under Maiao and his assistant teachers, four hundred and ninety-five male and female pupils, and under Kano, one hundred and sixty-nine, amounting together to six hundred and ninety-nine pupils, chiefly men and women, (Brinsmade 1858:21).”

The wind was against us as we entered the harbor at Waialua, and we were obliged to go into the harbor and then sail along the shore for about a mile. The next day we sailed for Whymea bay, on the west end of the island, to get another cargo of wood and fish. We stayed in the harbor for a few days, and then sailed along the shore about a mile. The land was high and mountainous, and we were obliged to “beat in.” As soon as we approached the land, Dr. Judd, Mr. Bingham, and Mr. Brinsmade, a merchant, came from Honolulu for the occasion. When they got to the meeting with any of the crowd of people standing, he ordered them to sit down on the floor packed together as close as possible, but a great many people who were bungling or bungling, thought my father, Dr. Judd, who had been in the country four years longer than he, began to ask questions, and found that La‘anui has not completed the construction of the new church at Waialua, and that the services were not very good, he did not force his people to attend church in that way... (Emerson 1828:55).
By the time Protestant missionaries were establishing their presence in Waialua in the 1830's, the sandalwood trade that had driven commerce in the Hawaiian Islands had collapsed. However, new enterprises were emerging to fill the void and activity at Waialua would continue apace. In October of 1819, two whale ships had anchored in the Hawaiian Islands. During the next decades, other whale ships would follow, as the islands became a provisioning and layover base in the mid-Pacific. Supplies of beef, fresh and salted, and produce were in demand; and a trade in hide and tallow was also developing. As had happened during the years of the sandalwood trade, authority to commandeer valued goods from the commoners of Waialua was vested in the chiefs:

The variety, as well as amount of things being appropriated from Waialua by the ruling chiefs is impressive. The letters of Gideon La’anui speak of ocean fish taken in sweeps as well as great quantities of fish shipped from the old royal ponds of ‘Uko’a and Lokoea, of dry cooked taro—pai’ai— as well as poi, of sweet potato, breadfruit, shrimp, goats and pigs, timbers of different kinds, chickens, oranges and lemons - and often cash money. (Kirch and Sahlins 1992:145)

3.1.3 Māhēle Documentation

Toward the mid-19th century, the Organic Acts of 1845 and 1846 initiated the process of the Māhēle — the division of Hawaiian lands — which introduced private property into Hawaiian society. In 1848 the crown, the Hawaiian government, and the ali’i (royalty) received their land titles. The majority of Waialua was awarded to Victoria Kamāmalu, sister of Alexander Liholiho (King Kamehameha IV) and Lot Kamehameha (King Kamehameha V). The overall ahupua’a of Kawailoa was awarded to Kamāmalu (Land Commission Award 7713 ‘Apana 33).

The common people (maka’a‘īmene) received their kuleana awards (individual land parcels) in 1850. It is through records for Land Commission Awards (LCAs) generated during the Māhēle that the first specific documentation of life in Hawai‘i’s, as it had evolved up to the mid-nineteenth century come to light. Although many Hawaiians did not submit or follow through on claims for their lands, the distribution of LCAs can provide insight into patterns of residence and agriculture. Many of these patterns of residence and agriculture probably had existed for centuries past. By examining the patterns of kuleana (commoner) LCA parcels in the vicinity of the project area, insight can be gained to the likely intensity and nature of Hawaiian activity in the area.

Four (4) LCAs (8345, 10246, 10772, & 10971) have been identified in the vicinity of the project area (Figure 7). Documentation from the LCAs was reviewed in an attempt to reconstruct indigenous Hawaiian land use patterns in the vicinity of the project area during the mid-nineteenth century (Table 2; see Appendix A). Though the testimonies recorded by the claimants and their witnesses are sometimes ambiguous, the kuleana data indicates a settlement pattern where households had multiple parcels (i.e. ‘āpuna) in different geographical locations, with the immediately coastal ‘āpuna being utilized for fishing and habitation and mānuka (inland) ‘āpuna being used as ‘ula (open country, pasture) to cultivate sweet potatoes. Additionally, pali (cliff, precipice, steep hill or slope) were being exploited for the collection of wauke (paper mulberry) & hala (pandanus). Thus the LCA documentation indicates a wide range of indigenous Hawaiian subsistence activities being practiced in the vicinity of the project area.
3.1.4 1850 to 1900

The whaling industry in the Pacific Ocean reached its peak in 1859. Prices for whale oil collapsed five years later. Since the 1840s, the Hawaiian economy had been dependent primarily on supplying whale ships during their long layovers in the islands. With the dwindling number of arriving ships during the 1860s, many residents of districts like Waialua, which had been dependent on the victualing trade, migrated to Honolulu and other parts of O'ahu.

Government censuses during the second half of the 19th century document the diminishing population of the Waialua District and, presumably, Kawailoa Ahupua'a. In 1853 a total of 1,126 persons were recorded in Waialua. Nineteen years later, in 1872, the total district population had dropped to 851 (Schmitt 1977:12-13).

During the second half of the 19th century, following the death of Victoria Kamāmalu in 1866, Kawailoa Ahupua'a was passed on to successive members of the ali'i:

[Kamāmalu's] entire estate was inherited by her father, Kekūanao'a. He died two years later and the estate went to Kekūanao'a's son Loa Kapūiwa, who by that time reigned as Kamehameha V... Kapūiwa died intestate in 1872, whereupon Ruta Ke'elikōlani, Kapūiwa's half-sister, petitioned for and received in 1873 the entire estate... By 1883, Ruta Ke'elikōlani died, leaving all of her estate to her cousin Bernice Pauahi Bishop (Kame'eleihiwa 1992:309-310).

The B. P. Bishop Estate Trust presently retains ownership of most of the ahupua'a.

The diaries of Robert C. Perkins, an entomologist and ornithologist, who collected specimens at Kawailoa in 1892-1893, reveal aspects of life in the ahupua'a near the end of the 19th century:

The end of 1892 and early months of 1893 were not very favorable for collecting, the weather being generally wet in the mountains and there were three big spates of the mountain streams, these did very much damage to the system of flumes belonging to the Chinese of the district on more than one occasion during the winter months. (Perkins 1892-1893)

The "Chinese of the district" Perkins mentions were the rice growers who had settled after fulfilling their contracts with the sugar plantations that had brought them to the Hawaiian Islands (the first Chinese contract laborers had arrived in 1852). The islands were well positioned for rice cultivation. A market for rice in California had developed as increasing numbers of Chinese laborers immigrated there since the mid-19th century. Similarly, Chinese immigration to the islands also accelerated, a domestic market opened:

By 1876 there was still a considerable amount of former taro land available for rice farming. The great demand for rice land brought disused taro patches into requisition - especially because water rights attached to them...

As the demand for rice continued, it became profitable to bring into use land hitherto unused. The land most easily rendered fit for rice cultivation was swamp

---

Table 2. Land Commission Awards Located in the vicinity of the Project Area

<table>
<thead>
<tr>
<th>Land Claim #</th>
<th>Claimant</th>
<th>'Ili (Place)</th>
<th>Land Use</th>
<th>Landscape Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>8345</td>
<td>Kaakaukua</td>
<td>Kapaolea, Ulumalu, Pahoa, Hau</td>
<td>Sweet potato cultivation &amp; fishing (squid fishery).</td>
<td>Sea/shore/dunes, pali (cliff, precipice, steep hill or slope), &amp; road/path.</td>
</tr>
<tr>
<td>10246</td>
<td>Maloiki</td>
<td>Kapaolea, Koolauhale, Kawaewaa</td>
<td>House lot &amp; sweet potato cultivation.</td>
<td>Wall/Fence &amp; pali.</td>
</tr>
<tr>
<td>10772</td>
<td>Pelapela</td>
<td>Poonahoa, Kapaolea</td>
<td>wauke (paper mulberry) &amp; hala (pandanus) cultivation/gathering.</td>
<td>Stream, road/path, &amp; pali.</td>
</tr>
<tr>
<td>10971</td>
<td>Wahinehune</td>
<td>Kapaolea, Amanui</td>
<td>House lot, 2 lo'i (ponded taro field), &amp; sweet potato cultivation.</td>
<td>Stream, wall/fence, road/path, &amp; pali.</td>
</tr>
</tbody>
</table>
In 1892, there were 80 acres under cultivation of rice in the Waialua District; these rice fields were located in the ahupua'a of Mokuleia, Kamanamui and Kawala (Ciolkosz and Chun 1973:12, 21). The immigrant Chinese may account for the rise in the Waialua District population during the latter part of the 19th century; government censuses recorded populations of 939 in 1871, 2,295 in 1880 and 2,926 in 1890 (Schmitt 1971:31). Robert Calhoun's diaries also reveal that Kawala and Waialua had become favorite hunting grounds of hikers. Calhoun, like many other visitors, found the area to be rich in natural beauty and wildlife.

Robert Calhoun's diaries also reveal that Kawala and Waialua had become favorite hunting grounds of hikers. Calhoun, like many other visitors, found the area to be rich in natural beauty and wildlife.

### 3.1.4 1900 to 1940s

By 1896, there were 1,349 persons recorded in Waialua District. Subsequent censuses recorded 3,285 persons in 1900, 6,083 in 1910, 7,641 in 1920, and 8,129 in 1930 (Schmitt 1977:13-14).

During the first decades of the 20th century, Waialua had become a favorite haunt of many Pacific Islanders. In 1898, Castle & Cooke organized the Waialua Agricultural Company and soon began a program of large-scale sugar farming in the district through the purchase of land and the construction of sugar mills. During the late 19th century, other ventures continued expanding sugar cultivation on the island, including the establishment of the Waialua Sugar Company in 1899. The company was capitalized on the increasing numbers of visitors to the north shore of O'ahu, and in 1902, it opened the Waialua Sugar Company, which continued to expand during the first decades of the 20th century, eventually reaching more than 12,000 acres, including a large portion of Kawala 'Ahupua'a, which was leased from the Bishop Estate. A 1943 War Department Map indicates that the Waialua Sugar Company had more than 50 percent of the total land area in cultivation (Figure 10).

### 3.1.5 1900 to 1940s

Following the Japanese attack and the United States' entrance into World War II, December 7, 1941, Waialua and the surrounding area was subjected to major infrastructure improvements associated with military activity. Military records indicate the construction of military facilities (Borthwick et al. 1998). These improvements in turn created the demand for labor, services, and associated constructions, which led to a further increase in population. A 1943 War Department Map indicates that the project area is still undeveloped, with the exception of the O.R. & L. railroad (Figure 10).

### 3.1.6 1940s to Present

While in 1896 there were 1,349 persons recorded in Waialua District, subsequent censuses recorded 3,285 persons in 1900, 6,083 in 1910, 7,641 in 1920, and 8,129 in 1930 (Schmitt 1977:13-14). The immigrant Chinese may account for the rise in the Waialua District population during the latter part of the 19th century; government censuses recorded populations of 939 in 1871, 2,295 in 1880 and 2,926 in 1890 (Schmitt 1977:13).

### 3.1.7 1940s to Present

The 1943 War Department Map indicates that the Waialua Sugar Company had more than 50 percent of the total land area in cultivation (Figure 10). The Waialua Sugar Company, which continued to expand during the first decades of the 20th century, eventually reaching more than 12,000 acres, including a large portion of Kawala 'Ahupua'a, which was leased from the Bishop Estate. A 1943 War Department Map indicates that the project area is still undeveloped, with the exception of the O.R. & L. railroad (Figure 10).

### 3.1.8 1940s to Present

During the last quarter of the 19th century: Government censuses record populations of 939 in 1871, 2,295 in 1880 and 2,926 in 1890, respectively. With the exception of the O.R. & L. railroad, the area remained undeveloped during the last quarter of the 19th century, with the exception of the O.R. & L. railroad (Figure 10). The Waialua Sugar Company, which continued to expand during the first decades of the 20th century, eventually reaching more than 12,000 acres, including a large portion of Kawala 'Ahupua'a, which was leased from the Bishop Estate. A 1943 War Department Map indicates that the project area is still undeveloped, with the exception of the O.R. & L. railroad (Figure 10).
Figure 8. 1929 USGS topographic map, Hale‘iwa Quadrangle, showing the project area in relation to the OR&L railroad and to “Kupupolo Heiau.”

Figure 9. 1978 USGS orthophoto showing extensive sugarcane cultivation just east of the project area.
Waialua and Waima bays, wave heights of 19 and 17 feet above sea level were recorded (Shepard et al 1950:418,421).

The O.R. & L. Company ceased operating its rail line in 1947. The Hale'iwa Hotel, which the U. S. Army had used as a recreation facility during the war, closed in 1952.

A 1954 Army Map Service map indicates a few structures within the project area. These structures probably correspond to the residential homes that are currently present with the project area (Figure 11). Also of note is that “Kupupolo Heiau” is still indicated as being present in the area.

3.2 Previous Archaeological Research

Previous archaeological studies in the vicinity of the current project area are presented in Table 3 and shown in Error! Reference source not found.. The following is a summary of these archaeological studies.

3.2.1 McAllister 1933

The earliest archaeological work in the Kawailoa Ahupua'a was conducted by J. Gilbert McAllister in the 1930s. McAllister identified 4 sites in the vicinity of the project area: Site 241 (Kūpopolo Heiau), Site 242 (rock shelter), Site 243 (Sacred stone), and Site 244 (Fishing shrine) (Figure 13).

**Site 241 Kūpopolo Heiau**

McAllister (1933:143-146) relates:

Kūpopolo Heiau around the bluff from Waima Bay about 300 feet from the road in the level area between the road and the bluff in the land known as Kawailoa. A two-terraced rock-paved structure 266 feet long by 110 feet maximum width, with a rather heavy stone wall dividing the two terraces. The heiau was visited and described by Thrum in 1905 and is practically in the same condition today [c. 1930] except that “The central third part of each [of the two main terraces] was well leveled off with small flat and broken stones filling in the chimks while those in the end of each division were in a loose and confused state.” This difference in paving was also noted by Emory in 1921 when he visited the site. There is now no noticeable difference in the paving of the terraces, except that in certain portions, as in the southwest corner, it is more disturbed than in other places. Now the eastern half of the northern division is dirt-paved, though this may have been caused by a wash from the adjoining bluff. Pits now located on the terraces were probably made by relic hunters.

McAllister goes on to supply an extensive description of the heiau from Thrum and supplies an annotated plan view map of the site. Kūpopolo Heiau is located approximately 130 m east of the present project area.
Table 3. Previous Archaeological Studies in the Vicinity of the Project Area

<table>
<thead>
<tr>
<th>Reference</th>
<th>Location</th>
<th>Nature of Study</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>McAllister 1933</td>
<td>Island of O'ahu</td>
<td>Island-wide archaeological survey</td>
<td>Identified 4 historic properties in the vicinity of the project area: Site 241 (Kupopolo Heiau), Site 242 (rock shelter), Site 243 (Sacred stone), and Site 244 (Fishing shrine)</td>
</tr>
<tr>
<td>Cluff 1968</td>
<td>Kupopolo Heiau and Adjacent Area</td>
<td>Preliminary Archaeological Surface Survey</td>
<td>Identified Kupopolo Heiau, an akua stone, petroglyphs, a cave, and a semi circular enclosure.</td>
</tr>
<tr>
<td>Welch 1981</td>
<td>TMK [1] 6-1-003: 026 &amp; 6-1-001: 001</td>
<td>Archaeological Reconnaissance Survey</td>
<td>10 historic properties were identified: heiau, water hole, enclosures, 2 stone walls, rock shelters, midden scatter, midden deposits, stone platforms, and a railroad bed.</td>
</tr>
<tr>
<td>Athens &amp; Shun 1982</td>
<td>TMK [1] 6-1-003: 026</td>
<td>Archaeological test excavations and mapping</td>
<td>Testing revealed extensive fish bone and marine shell midden as well as the presence of numerous indigenous Hawaiian artifacts including fishhooks, coral and sea urchin spine files, volcanic glass flakes, basalt adzes, and an 'ulu maika (game stone). The volcanic glass samples were dated to the mid-15th century.</td>
</tr>
<tr>
<td>Masterson et al. 1995</td>
<td>TMK [1] 6-1-005: 014 por.</td>
<td>Archaeological Reconnaissance</td>
<td>Identified pre-contact walls possibly associated with Puapua Heiau and a historic bridge constructed of basalt and mortar.</td>
</tr>
</tbody>
</table>

Figure 11. 1954 Army Map Service map showing the location of the project area.
Archaeological Inventory Survey for the Kāpākūloa Cultural Learning Project at Kawailoa Ahupua'a

Project Area

Figure 12. USGS 7.5-Minute Series Topographic Map, Waimea quadrangle (1998), showing previous archaeological studies in the vicinity of the project area.

Figure 13. 1959 Bishop Museum map of the Wailua District showing McAllister sites in the vicinity of the project area.
In 1882, the Bishop Museum conducted archaeological test excavations and mapping of the following: religious/ceremonial, transportation, habitation, and animal husbandry. Water hole known as a traditional Hawaiian resting spot. Interpreted site functions included the platforms, rock shelters, a surface midden scatter, a railroad bed, a concrete foundation, and a parcel on the south side of Waimea Bay, located along the northeastern border of the current project area (Welch 1981). ... post-contact origin were identified. Documented site types included stone enclosures and walls, stacked stone and earthen features. According to Hookala, a black suckling pig was brought before the akua stone in the ceremonies preceding the opening of the tapu days. Evidently it was not necessary to kill the pig, for when it was placed before the stone it “stood and shivered, and dropped dead.”

In 1968. Heiau and the adjacent area, an area located immediately east of the current project area (Cluff 1968). This shrine is located approximately 50 m north of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This tongue-shaped stone, with only the tip protruding above the ground, can still be seen. Upon awakening they dreamed that the stone would like to be brought to land, for it is very cold in the sea.” So that day they again went out and in casting their nets again brought up the same stone, which they carefully brought to shore and placed on the land. Then they returned to their nets and caught more fish than they could bring back. They then returned and placed them in the same shelter, and fish again fell into a sound sleep. According to Mrs. Anne Keahipaka, from whom I heard this legend, the stone was called Kaneaukai. A shrub known as the water horehore, or Kawaiaha’o, grew on its top and was considered to be sacred. The shrine is rectangular in shape, 47 by 38 feet, interior dimensions, with heavy walls. The outer side appears to have had a small kahili both inside and outside. The front side of the wall, which was on the exterior of the wall, was 1 foot thick with two pieces of lava 3 feet high with two portions of walls, following the irregular edge of the height. Adjacent to the southwest wall is a small irregular ledge 14 feet higher than the top of the wall. Near the mountain side of the shrine is an outcrop of lava some 20 feet high, with two portions of walls, following the irregular edge of the height.

This shrine is located approximately 50 m north of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area. This sacred stone was located approximately 130 m northeast of the present project area.
Fieldwork consisted of subsurface testing at 2 midden sites (SIHP #50-80-01-2483 & -2484), and mapping of various surface sites. Testing revealed extensive fish bone and marine shell midden as well as the presence of numerous indigenous Hawaiian artifacts including: fishhooks, coral and sea urchin spine files, volcanic glass flakes, basalt adzes, and an ‘ulu maika (game stone). Hydration rind analysis of collected volcanic glass samples at SIHP -2483 yielded an estimated occupation of the site to the mid-15th century.

A site location map generated by the Bishop Museum places three historic properties within the current project area (Athens & Shun 1982) (Figure 14). These three historic properties consist of: SIHP #50-80-01-2483, a concrete foundation and stone wall with an associated midden deposit containing indigenous Hawaiian artifacts; SIHP #50-80-01-2487, a complex of stone and earthen platforms possibly of post-contact origin; and SIHP #50-80-01-2489, a segment of OR&L railroad berm.

### 3.2.4 Masterson et al. 1995

In 1995, CSH conducted an archaeological reconnaissance survey of an approximately 3-acre parcel at Kawailoa Beach, located approximately 1.7 km southwest of the current project area (Masterson et al. 1995). The reconnaissance survey identified stacked basalt boulder walls, a historic bridge constructed of basalt and mortar, and a segment of the OR&L right-of-way (SIHP #50-80-12-9714). Of note are the stacked basalt walls as they were identified by the Cultural Historian of Waimea Valley Park as remnants of Pupuane Heiau (per comm. Rudy Mitchell 1995 in Masterson et al. 1995). However, Pupuane Heiau was determined by J.G. McAllister as being located at Punahue Point, some 500 ft makai and west of the identified walls (McAllister 1933 in Masterson et al. 1995). Thus it was determined that the observed walls were not associated with Pupuane Heiau.

### 3.2.5 Hammatt & Shideler 2006

In 2006, CSH conducted an archaeological literature review and field inspection of an approximately 7-acre area located immediately southeast of the current project area (Hammatt & Shideler 2006). During the field inspection walls and terraces of traditional Hawaiian construction were identified.

Figure 14. Athens and Shun (1982) site location map showing historic properties within the project area (SHIP -2483, -2487, & -2489)
3.2.6 Thurman & Hammatt 2010
In 2009, CSH conducted archaeological monitoring for vegetation clearing at Kupopolo Heiau (McAllister Site 241). Following vegetation clearance, the heiau documented via GPS, photographs, and the entire structure was remapped.

3.3 Background Summary and Predictive Model

Based on background research, historic properties (i.e., archaeological sites) in the form of pre- and post-contact surface structures and subsurface cultural deposits may be encountered during the archaeological inventory survey of the project area.

Historic research has identified four (4) LCAs (8345, 10246, 10772, & 10971) in the vicinity of the project area, suggesting indigenous Hawaiian land use in the form of habitation and agriculture (see Figure 7). Historic research has also indicated the presence of the OR&L railroad within the northern portion of the project area.

Previous archaeological investigations have identified numerous pre-contact historic properties in the vicinity of the project area including: heiau, fishing shrines, sacred stones, stone walls, enclosures, and platforms. Previous archaeological investigations have also identified post-contact historic properties in the vicinity of the project area primarily associated with OR&L railroad infrastructure (bridges, railroad beds, etc.).

Of note is a 1982 Bishop Museum study conducted immediately northeast of the project area (Athens & Shun 1982). This study identified three historic properties within the current project area: SIHP #50-80-01-2483, a concrete foundation and stone wall with an associated midden deposit containing indigenous Hawaiian artifacts; SIHP #50-80-01-2487, a complex of stone and earthen platforms possibly of post-contact origin; and SIHP #50-80-01-2489, a segment of OR&L railroad berm. Subsurface testing at SIHP #2483 revealed extensive fish bone and marine shell midden as well as the presence of numerous indigenous Hawaiian artifacts including: fishhooks, coral and sea urchin spine files, volcanic glass flakes, basalt adzes, and an ‘ulu maika (game stone). Hydration rind analysis of collected volcanic glass samples yielded an estimated occupation of the site to the mid-15th century.

Evidence of indigenous Hawaiian land use within the project area could include enclosures, walls, and platforms, as well as subsurface cultural deposits containing midden, artifacts, and/or human burials. Evidence of post-contact land use could include OR&L railroad infrastructure in the form of railroad berms, support foundations, and railroad tracks. Subsurface cultural deposits in the form of trash pits, privies, building foundations, and/or human burials could also be present.

4.2 GPR Survey

A ground penetrating radar (GPR) survey was conducted within the project area prior to subsurface testing in an attempt to define the local stratigraphy and to prospect for buried cultural deposits. Two discrete locations within the southern portion of the project area were surveyed with GPR (Figure 18). A majority of the project area was not accessible for GPR survey due to dense vegetation and/or uneven ground surfaces.
Cultural Surveys Hawai'i Job Code: KAWAILOA 1

Results of Fieldwork

Archaeological Inventory Survey for the Kaipulehu Cultural Learning Project at Waianae Ahupua'a

Figure 15. U.S. Geological Survey (USGS) 7.5-Minute Series Topographic Map, Waimea Quadrangle (1998), showing the location of documented historic properties within the project area.

Figure 16. Aerial photograph (Google Earth 2010) showing the location of historic properties within the project area.
Cultural Surveys Hawai‘i Job Code: KAWAILOA 1

Results of Fieldwork

Archaeological Inventory Survey for Kawailoa Ahupua‘a

Table 4. Historic Properties Identified Within the Project Area

<table>
<thead>
<tr>
<th>SHIP #</th>
<th>Temporary #</th>
<th>Site Type</th>
<th>Features</th>
<th>Age</th>
<th>Function</th>
<th>Significance Criteria</th>
<th>Mitigation Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-80-01</td>
<td>-2489</td>
<td>CSH2</td>
<td>Earthen berm and terraces</td>
<td>2</td>
<td>Post-contact</td>
<td>Transportation</td>
<td>D</td>
</tr>
<tr>
<td>50-80-01</td>
<td>-7144</td>
<td>CSH1</td>
<td>Terrace, wall, wastewater disposal infrastructure</td>
<td>5</td>
<td>Post-contact</td>
<td>Habitation</td>
<td>D</td>
</tr>
<tr>
<td>50-80-01</td>
<td>-7145</td>
<td>CSH3</td>
<td>Terrace, dirt road, concrete foundations, alignments</td>
<td>3</td>
<td>Post-contact</td>
<td>Habitation</td>
<td>D</td>
</tr>
</tbody>
</table>

Figure 17. Photograph of the southeastern portion of project area illustrating artificially leveled ground surface associated with historic O.R. & R. construction, view to northeast.
Results of Fieldwork

Archaeological Inventory Survey for

At Kawailoa Ahupua’a

Survey Area 2

Survey Area 1

GPR Survey Area

Project Area

Figure 18. Aerial photograph (Google Earth 2010) showing the location of GPR survey areas within the project area

2D depth profiles and horizontal slice maps of GPR data collected at each survey area were analyzed. The depth profiles consist of a subsurface profile of the GPR data, illustrating the entire range of subsurface radar penetration that was possible during the survey, while the horizontal slices are similar to plan view maps taken at arbitrary depth intervals, and are useful for displaying the general shape and spatial distribution of recorded subsurface anomalies.

Subsurface anomalies were visible down to 100 cm below the existing ground surface. Identified subsurface anomalies within the project area were of varying size, distribution, and prominence. Based on soil survey data (see Section 1.4 above; Foote et al. 1972) most of the observed anomalies are anticipated to be associated with basalt boulders or the presence of shallow bedrock. However, background research and the pedestrian survey of the project area indicate that the project area was utilized for post-contact habitation and transportation via the O.R. & L. railroad. Thus observed anomalies could correspond to subsurface features such as: backfilled machine excavations, abandoned utility lines, buried building foundations, and miscellaneous construction debris. Background research has also indicated pre-contact indigenous Hawaiian habitation in the immediate vicinity of the project area (Athens and Shun 1982), thus indicating that the observed anomalies may also correspond to buried archaeological deposits including: fire pits, midden and artifact concentrations, and human burials.

The interpretation of these anomalies prior to ground truthing via excavation is not an exact science, but rather an educated guess based on an analysis of the size, distribution, and prominence of observed anomalies and incorporating that data with background research of the project area’s prior land use history. A detailed analysis of the observed anomalies per survey area follows this general discussion below.

In regard to project area stratigraphy, GPR depth profiles indicated that the soils within the southern portion of project area were relatively uniform, consisting of a single sediment type deposited atop relatively shallow (i.e. 75-100 cmbs) bedrock.

4.2.1 Survey Area 1

Survey Area 1 was located near the southeastern corner of the project area, situated atop a cleared level soil area (see Figure 18). The survey area measured approximately 8 m by 8 m, and involved the collection of 33 (NE by SW), 8 m long transects spaced 25 cm apart.

A review of horizontal slice maps indicates the presence of numerous anomalies of varying size and prominence (Figure 19 to Figure 21). There was no clear pattern to the distribution of the anomalies, which were present within approximately 75% of Survey Area 1. The anomalies were most prominent between 25 and 75 cm below the surface (see Figure 20 and Figure 21). Based on soil survey data (see Section 1.4 above; Foote et al. 1972) these anomalies likely correspond to naturally occurring basalt boulders and bedrock.

GPR depth profiles collected at Survey Area 1 indicate the presence of prominent subsurface anomalies from 0 to 75 cm below the existing surface (Figure 22 to Figure 24). A continuous mass of anomalies was observed from 60 to 80 cmbs. These anomalies likely correspond to basalt bedrock, while all of the isolated anomalies above this anomaly concentration probably correspond to naturally deposited basalt boulders. Also of note is the presence of a horizontal
Results of Fieldwork

Archaeological Inventory Survey for the Kāpūloa Cultural Learning Project at Kawailoa Ahupua‘a

Figure 19. Horizontal slice map, 0-25 cmbs, Survey Area 1

Figure 20. Horizontal slice map, 25-50 cmbs, Survey Area 1
Archaeological Inventory Survey for the Kāpahulu Cultural Learning Project at Kawailoa Ahupua'a

Figure 21. Horizontal slice map, 50-75 cmbs, Survey Area 1

Figure 22. GPR Profile 1, Survey Area 1
Archaeological Inventory Survey for the Kāne‘ohe Cultural Learning Project at Kawailoa Ahupua‘a

Figure 23. GPR Profile 2, Survey Area 1

Figure 24. GPR Profile 3, Survey Area 1
band with a wavy topography within the profiles. This band is present from approximately 20 to 50 cm below the ground surface and may represent a change in stratigraphy. Based on background research and the results of the pedestrian survey, it is believed that this horizontal band represents a transition between fill sediments associated with historic development and naturally deposited alluvium and colluviums.

During the subsurface testing phase of fieldwork (see Section 4.3 below) a backhoe trench (Trench 14) was excavated within the southern boundary of GPR Survey Area 1 (see Figure 19 to Figure 21). Test excavation confirmed the initial interpretation of subsurface anomalies corresponding to naturally occurring basalt boulders and bedrock. GPR slice maps indicated that basalt boulders and bedrock would be more prominent within the makai (northwest) half of the trench (see Figure 20). Test excavations confirmed this (Figure 25). GPR profiles also indicated that bedrock would be encountered between 75 and 100 cmbs (see Figure 23). Test excavation revealed the presence of bedrock from 115 to 200 cmbs. While there was a discrepancy of the bedrock's depth, the GPR was able to accurately predict its presence.

Test excavation also revealed the presence of fill sediments from 0 to 100 cmbs. Again while there was a discrepancy of the depth of the transitional zone between fill and naturally occurring sediment, the GPR was able to predict its presence.

A detailed discussion of Trench 14, including stratigraphic profiles, soil descriptions, and photographs, is provided below in Section 4.3.

4.2.2 Survey Area 2

Survey Area 2 is located near the southeastern corner of the project area, situated atop a cleared level soil area (see Figure 18). The survey area measured approximately 12 m by 6 m, and involved the collection of 25 (NE by SW), 12 m long transects spaced 25 cm apart.

A review of horizontal slice maps indicates the presence of numerous anomalies of varying size and prominence (Figure 26 to Figure 28). There was no clear pattern to the distribution of the anomalies, which were present within approximately 30% of Survey Area 2. The anomalies were most prominent between 0 to 20 cm below the surface (see Figure 26). Based on soil survey data (see Section 1.4 above; Foote et al. 1972) these anomalies likely correspond to naturally occurring basalt boulders. Survey Area 2 differs from Survey Area 1 in that there are far fewer anomalies and the most prominent anomalies appear closer to the surface. This indicates that Survey Area 2 may have deeper soil deposits and less naturally occurring basalt boulders.

GPR depth profiles collected at Survey Area 2 indicate the presence of prominent subsurface anomalies from 0 to 75 cm below the existing surface (Figure 29 to Figure 31). Unlike the GPR profiles from Survey Area 1, the Survey Area 2 profiles contain more isolated anomalies distributed closer to the surface. These anomalies likely correspond to naturally deposited basalt boulders. Of note is an interesting pattern of anomalies observed in Profile 3 (see Figure 31), from 6 to 12 m along the transect, at a depth of 15 cmbs. This pattern is consistent with the signature commonly associated with concrete, with the GPR reacting to the individual rebar within the concrete. This pattern of anomalies may correspond to a buried concrete slab or to...
Results of Fieldwork

Archaeological Inventory Survey for the Kūpaloa Cultural Learning Project at Kawailoa Ahupua’a

Figure 26. Horizontal slice map, 0-25 cmbs, Survey Area 2

Figure 27. Horizontal slice map, 25-50 cmbs, Survey Area 2
Results of Fieldwork

Archaeological Inventory Survey for the Kāpūlehu Cultural Learning Project at Kawailoa Ahupua'a

Figure 28. Horizontal slice map, 50-75 cmbs, Survey Area 2

Figure 29. GPR Profile 1, Survey Area 2
Results of Fieldwork
Archaeological Inventory Survey for 
at Kawailoa Ahupua'a
TMK: [1] 6-1-003: 056 por.

Figure 30. GPR Profile 2, Survey Area 2

Figure 31. GPR Profile 3, Survey Area 2
some sort of base course (i.e. crushed coral or basalt gravel) associated with the pervious grading of the area.

During the subsurface testing phase of fieldwork (see Section 4.3 below) two backhoe trenches (Trench 12 and 13) were excavated within GPR Survey Area 2 (see Figure 26 to Figure 28). Test excavation confirmed the initial interpretation of subsurface anomalies corresponding to naturally occurring basalt boulders and bedrock. GPR slice maps and profiles indicated that basalt boulders would likely be present throughout the majority of both trenches (see Figure 26 to Figure 28), test excavations confirmed this (Figure 32).

Test excavation also revealed the presence of fill sediments from 0 to 100 cmbs. The GPR did not indicate a transition between fill and natural sediment in Survey Area 2, this is probably because the fill and natural material were of similar consistency and not detectable by the GPR.

A detailed discussion of Trench 12 and 13, including stratigraphic profiles, soil descriptions, and photographs, is provided below in Section 4.3.

4.3 Test Excavation Findings

4.3.1 Stratigraphic Summary

14 backhoe trenches were excavated within the project area to assess the stratigraphy and potential for subsurface cultural deposits. All of the trenches were distributed within four blocks delineated by the project developer (Group 70 International, Inc.), as areas of potential subsurface disturbance such as, septic tank and leach field installation (Figure 33 and Figure 34).

The amount of trenches and their distribution were limited, in part, by dense vegetation present throughout a majority of the project area, this required some vegetation clearing prior to backhoe excavation.

Based on backhoe testing results, the stratigraphy within the project area is largely as expected. The following paragraphs provide an overview and summary of the backhoe testing results. For detailed information regarding each of the excavated trenches, please refer to the trench profiles, sediment descriptions, and photographs, which follow this more general summary discussion (Figure 35 to Figure 62).

In general the observed and documented stratigraphy consisted of relatively shallow naturally deposited alluvial sediment deposited atop basalt bedrock. This pattern deviated slightly within the southern portion of the project area (see Trenches 12-14 below) where fill material was observed capping the naturally deposited alluvial sediment. This was expected as this portion of the project area consisted of a large level soil terrace (SIHP -7145A) likely utilized as a post-contact house foundation (see Section 4.4 below).

Trench 11, situated within the northeastern corner of the project area, also yielded findings deviating from the norm. Stratigraphy within this trench consisted of a single stratum defined by large basalt boulders with thin pockets of silt. This indicated that the immediate area was artificially built up and leveled, likely used as a post-contact foundation associated with SIHP -7144 (a post-contact habitation; see Section 4.4 below), located 4 m to the northwest.

Figure 32. Photograph of Trench 13, showing the large basalt boulders present beneath the surface of GPR Survey Area 2, view to north
Figure 33. Aerial photograph (Google Earth 2010) showing the location of excavated backhoe trenches within the project area.
Figure 34. Topographic map of project area showing development blocks 1-4 (source: Patrick M. Cummings, Land Surveyor 2009)
Also of note was the presence of earthen berm construction, associated with the O.R. & L. railroad (SIHP -2489), observed within Trenches 1, 8, 12, and 14. Based on trench stratigraphy, O.R. & L. railroad berm construction within the project area consisted of mounded sandy clay loam deposited atop a sand base course.

### 4.3.2 Trench Documentation

#### 4.3.2.1 Trench 1

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<td>Length</td>
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<td>Maximum Depth</td>
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</table>

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cmbd*)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-60</td>
<td>10 YR 3/2, very dark grayish brown; silt clay loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; mixed origin; abrupt lower boundary; wavy topography. Remnant of earthen railroad berm construction. No cultural material observed.</td>
</tr>
<tr>
<td>Ib</td>
<td>45-90</td>
<td>10 YR 8/3, very pale brown; sand; structureless; dry loose consistency; non plastic; no cementation; marine origin; abrupt lower boundary; smooth topography. Remnant of earthen railroad berm construction; base course of railroad berm. No cultural material observed.</td>
</tr>
<tr>
<td>II</td>
<td>90-200 (BOE**)</td>
<td>5 YR 4/6, yellowish red; clay loam; moderate medium crumb structure; dry hard consistency; plastic; weak cementation; terrigenous origin. Contains numerous basalt boulders and cobbles. Naturally deposited alluvial sediment. No cultural material observed.</td>
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*Centimeters below datum

**Base of excavation
4.3.2.2 Trench 2

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<td>Maximum Depth</td>
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<th>Stratum</th>
<th>Depth (cmbs*)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-20</td>
<td>7.5 YR 3/4, dark brown silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; clear lower boundary; wavy topography. Modern A-horizon. No cultural material observed.</td>
</tr>
<tr>
<td>Ib</td>
<td>20-100 (BOE**)</td>
<td>10 YR 3/4, dark yellowish brown; clay loam; moderate medium crumb structure; dry weakly coherent consistency; slightly plastic; no cementation; terrigenous origin. Naturally deposited alluvial sediment. No cultural material observed.</td>
</tr>
</tbody>
</table>

*Centimeters below surface

**Base of excavation

Figure 37. Stratigraphic profile of Trench 2

Figure 38. Photograph of Trench 2, view to east
### 4.3.2.3 Trench 3

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<th>Stratum</th>
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<th>Description</th>
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<tbody>
<tr>
<td>Ia</td>
<td>0-10</td>
<td>7.5 YR 3/4, dark brown; silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; clear lower boundary; wavy topography. Modern A-horizon. No cultural material observed.</td>
</tr>
<tr>
<td>Ib</td>
<td>10-100 (BOE**)</td>
<td>10 YR 3/4, dark yellowish brown; clay loam; moderate medium crumb structure; dry weakly coherent consistency; slightly plastic; no cementation; terrigenous origin. Naturally deposited alluvial sediment. No cultural material observed.</td>
</tr>
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*Centimeters below surface

**Base of excavation

Figure 39. Stratigraphic profile of Trench 3

Figure 40. Photograph of Trench 3, view to north
### 4.3.2.4 Trench 4

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<td>0-110</td>
<td>7.5 Y R 3/4, dark brown; silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; clear lower boundary; irregular topography. Contains modern trash (i.e. cans &amp; bottles). Previously disturbed naturally deposited sediment. No cultural material observed.</td>
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<tr>
<td>II</td>
<td>60-190</td>
<td>10 Y R 3/2, very dark grayish brown; clay; moderate medium blocky structure; moist firm consistency; plastic; no cementation; terrigenous origin. Naturally deposited alluvial sediment. No cultural material observed.</td>
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<tr>
<td>III</td>
<td>140-240 (BOE**)</td>
<td>5 Y R 4/6, yellowish red; clay loam; moderate medium crumb structure; dry hard consistency; plastic; weak cementation; terrigenous origin. Contains numerous basalt boulders and cobbles. Naturally deposited alluvial sediment. No cultural material observed.</td>
</tr>
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</table>

*Centimeters below surface  
**Base of excavation
### 4.3.2.5 Trench 5

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<th>Depth (cmbs*)</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>0-110</td>
<td>7.5 YR 3/4, dark brown; silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; clear lower boundary; smooth topography. Contains modern trash (i.e. cans &amp; bottles). Previously disturbed naturally deposited sediment. No cultural material observed.</td>
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<tr>
<td>II</td>
<td>110-200 (BOE**)</td>
<td>5 YR 4/6, yellowish red; clay loam; moderate medium crumb structure; dry hard consistency; plastic; weak cementation; terrigenous origin. Contains numerous basalt boulders and cobbles. Naturally deposited alluvial sediment. No cultural material observed.</td>
</tr>
</tbody>
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*Centimeters below surface
**Base of excavation

---

Figure 43. Stratigraphic profile of Trench 5

Figure 44. Photograph of Trench 5, view to south
### 4.3.2.6 Trench 6

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<td>Ia</td>
<td>0-40</td>
<td>7.5 YR 3/4, dark brown; silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; clear lower boundary; wavy topography. Modern A-horizon. No cultural material observed.</td>
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<tr>
<td>Ib</td>
<td>10-130 (BOE**)</td>
<td>10 YR 3/4, dark yellowish brown; clay loam; moderate medium crumb structure; dry weakly coherent consistency; slightly plastic; no cementation; terrigenous origin. Naturally deposited alluvial sediment. No cultural material observed.</td>
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*Centimeters below surface

*Base of excavation

---

**Figure 45. Stratigraphic profile of Trench 6**

**Figure 46. Photograph of Trench 6, view to east**
4.3.2.7 Trench 7

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<th>Description</th>
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<tr>
<td>I</td>
<td>0-140 (BOE**)</td>
<td>10 YR 6/6, brownish yellow; clay loam; moderate medium crumb structure; dry weakly coherent consistency; slightly plastic; no cementation; terrigenous origin. Naturally deposited alluvial sediment. No cultural material observed.</td>
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* Centimeters below surface

** Base of excavation

Figure 47. Stratigraphic profile of Trench 7

Figure 48. Photograph of Trench 7, view to southeast
4.3.2.8 Trench 8

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<td>10 YR 3/2, very dark grayish brown; silt clay loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; mixed origin; abrupt lower boundary; wavy topography. Remnant of earthen railroad berm construction. No cultural material observed.</td>
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<td>Ib</td>
<td>40-80</td>
<td>10 YR 8/3, very pale brown; sand; structureless; dry loose consistency; non plastic; no cementation; marine origin; abrupt lower boundary; smooth topography. Remnant of earthen railroad berm construction; base course of railroad berm. No cultural material observed.</td>
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<td><strong>II</strong></td>
<td><strong>80-230</strong> (BOE**)</td>
<td>5 YR 4/6, yellowish red; clay loam; moderate medium crumb structure; dry hard consistency; plastic; weak cementation; terrigenous origin. Contains numerous basalt boulders and cobbles. Naturally deposited alluvial sediment. No cultural material observed.</td>
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*Centimeters below datum

**Base of excavation
4.3.2.9 Trench 9

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<td>0-90 (BOE**)</td>
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*Centimeters below surface
**Base of excavation

Figure 51. Stratigraphic profile of Trench 9

Figure 52. Photograph of Trench 9, view to southeast
### 4.3.2.10 Trench 10

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<td>0-140 (BOE**)</td>
<td>7.5 Y R 6/8, reddish yellow; clay loam; moderate medium crumb structure; dry weakly coherent consistency; slightly plastic; no cementation; terrigenous origin. Naturally deposited alluvial sediment. Contains numerous basalt cobbles and boulders. No cultural material observed.</td>
</tr>
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</table>

*Centimeters below surface  
**Base of excavation

---

Figure 53. Stratigraphic profile of Trench 10

Figure 54. Photograph of Trench 10, view to northeast
4.3.2.11 Trench 11

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<tbody>
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<td>Length</td>
<td>3 m</td>
</tr>
<tr>
<td>Width</td>
<td>0.8 m</td>
</tr>
<tr>
<td>Maximum Depth</td>
<td>1.2 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cmbs*)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0-120 (BOE**)</td>
<td>7.5 YR 3/4, dark brown; silt; structureless; dry loose consistency; non plastic; no cementation; terrigenous origin. Naturally deposited alluvial sediment. Contains 80% basalt boulders. Artificially deposited stratum associated with historic road or residential development. No cultural material observed.</td>
</tr>
</tbody>
</table>

*Centimeters below surface

**Base of excavation

Figure 55. Stratigraphic profile of Trench 11

Figure 56. Photograph of Trench 11, view to northeast
4.3.2.12 Trench 12

<table>
<thead>
<tr>
<th>Orientation</th>
<th>301° TN</th>
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<tbody>
<tr>
<td>Length</td>
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<tr>
<td>Width</td>
<td>0.8 m</td>
</tr>
<tr>
<td>Maximum Depth</td>
<td>1.7 m</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cm)*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-10</td>
<td>7.5 Y 5/4, dark brown; sandy silt loam; structureless; dry loose consistency; non plastic; weak cementation; mixed origin; abrupt lower boundary; smooth topography. Modern A-horizon. No cultural material observed.</td>
</tr>
<tr>
<td>Ib</td>
<td>10-90</td>
<td>10YR 6/6 brownish yellow; silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; abrupt lower boundary; irregular topography. Fill material. No cultural material observed.</td>
</tr>
<tr>
<td>IIa</td>
<td>10-80</td>
<td>10 YR 3/2, very dark grayish brown; silt clay loam; moderate fine crumb structure; dry loose consistency; non plastic; weak cementation; mixed origin; abrupt lower boundary; wavy topography. Remnant of earthen railroad berm construction. No cultural material observed.</td>
</tr>
<tr>
<td>IIb</td>
<td>80-100</td>
<td>10 YR 8/3, very pale brown; sand; structureless; dry loose consistency; non plastic; no cementation; marine origin; abrupt lower boundary; smooth topography. Remnant of earthen railroad berm construction; base course of railroad berm. No cultural material observed.</td>
</tr>
<tr>
<td>III</td>
<td>100-170 (BOE**)</td>
<td>5 YR 4/6, yellowish red; clay loam; moderate medium crumb structure; dry hard consistency; plastic; weak cementation; terrigenous origin. Contains numerous basalt boulders and cobbles. Naturally deposited alluvial sediment. No cultural material observed.</td>
</tr>
</tbody>
</table>

*Centimeters below surface

**Base of excavation
### 4.3.2.13 Trench 13

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cmbs*)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>0-70</td>
<td>10YR 6/6 brownish yellow; silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; abrupt lower boundary; smooth topography. Fill material. No cultural material observed.</td>
</tr>
<tr>
<td>II</td>
<td>70-150 (BOE**)</td>
<td>5 YR 4/6, yellowish red; clay loam; moderate medium crumb structure; dry hard consistency; plastic; weak cementation; terrigenous origin. Contains numerous basalt boulders and cobbles. Naturally deposited alluvial sediment. Modern fire pit containing plastic, glass, and metal fragments observed within stratum.</td>
</tr>
</tbody>
</table>

*Centimeters below surface

**Base of excavation

---

Figure 59 Stratigraphic profile of Trench 13

Figure 60. Photograph of Trench 13, view to west
### 4.3.2.14 Trench 14

**Orientation** 128° TN

<table>
<thead>
<tr>
<th>Stratum</th>
<th>Depth (cmbs*)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>0-10</td>
<td>7.5 YR 5/4, dark brown; sandy silt loam; structureless; dry loose consistency; non plastic; weak cementation; mixed origin; abrupt lower boundary; smooth topography. Modern A-horizon. No cultural material observed.</td>
</tr>
<tr>
<td>Ib</td>
<td>10-60</td>
<td>10 YR 6/6 brownish yellow; silt loam; weak fine crumb structure; dry loose consistency; non plastic; weak cementation; terrigenous origin; abrupt lower boundary; irregular topography. Fill material. No cultural material observed.</td>
</tr>
<tr>
<td>Ic</td>
<td>40-60</td>
<td>10 YR 3/2, very dark grayish brown; silty sand; structureless; dry loose consistency; non plastic; no cementation; mixed origin; abrupt lower boundary; smooth topography. Fill material. No cultural material observed.</td>
</tr>
<tr>
<td>IIa</td>
<td>10-50</td>
<td>10 YR 3/2, very dark grayish brown; silt clay loam; moderate fine crumb structure; dry loose consistency; non plastic; weak cementation; mixed origin; abrupt lower boundary; wavy topography. Remnant of earthen railroad berm construction. No cultural material observed.</td>
</tr>
<tr>
<td>IIb</td>
<td>50-100</td>
<td>10 YR 8/3, very pale brown; sand; structureless; dry loose consistency; non plastic; no cementation; marine origin; abrupt lower boundary; smooth topography. Remnant of earthen railroad berm construction; base course of railroad berm. No cultural material observed.</td>
</tr>
<tr>
<td>III</td>
<td>90-180 (BOE**)</td>
<td>5 YR 4/6, yellowish red; clay loam; moderate medium crumb structure; dry hard consistency; plastic; weak cementation; terrigenous origin. Contains numerous basalt boulders and cobbles. Naturally deposited alluvial sediment. No cultural material observed.</td>
</tr>
</tbody>
</table>

*Centimeters below surface

**Base of excavation

Figure 61. Stratigraphic profile of Trench 14

Figure 62. Photograph of Trench 14, view to north
### Site Descriptions

**4.4 SIHP #50-80-01-2489**

<table>
<thead>
<tr>
<th>TEMPORARY #</th>
<th>CSII.1</th>
<th>TEMPORARY FIELD OBSERVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSII.1</td>
<td>1</td>
<td>Soil and vegetation conditions were observed.</td>
</tr>
</tbody>
</table>

**Formal Type:** Earthen railroad berm & terraces

**Function:** Transportation

**Age:** Post-contact (ca. 1890-1946)

**Dimensions:**

- 78 m long (NE-SW)
- 5 m wide at base
- Maximum height of 2 m

**Location:** Bisects the middle of the project area in a roughly NE by SW direction.

**Tax Map Key:** [1] 6-1-003: 056 por.

**Land Jurisdiction:** B. P. Bishop Estate Trust

No cultural material was observed on the ground surface within and in the immediate vicinity of SIHP #2489. The alluvial soils that comprise the railroad berm are reddish in color, and the surficial geology consists of hard basalt bedrock. The railroad berm is located at the upland edge of a gentle slope. The railroad berm was utilized by the O.R. & L. railroad trains (Figure 16). SIHP #2489 was originally documented by the Bishop Museum during an archaeological reconnaissance survey of a parcel adjoining the northern boundary of the project area (Welch 1981). The following is Welch's (1981) description of SIHP #2489:

From the south boundary of the property, the railroad bed is raised about 2 m above the meadow vegetation and runs northward about 0.2 km. Near the northward bend on the railroad bed is a level clearing with a raised bench, and a level area is also present near the railroad bed. A line of cinder blocks is placed along the railroad bed (Feature A). The railroad bed is bisected by a small stone wall (Feature B). The railroad bed is well maintained and is subject to occasional maintenance activities. It is possible that these steps were utilized by O.R. & L. railroad trains as a location to procure water-rounded basalt boulders located at the railroad bed. SIHP #2489 maintains integrity of location. The portion of SIHP #2489 within the current project area is consistent with the description provided by Welch (1981). From the property line, it is no longer distinctly raised. About 30 m to the northwest at the cut through the rock bluff begins, near the upland boundary. The vegetation consists of open woodland of ironwood and koa haole. (Welch 1981: 17).
Results of Fieldwork
Archaeological Inventory Survey for Kawailoa ahupua'a

TMK: [1] 6-1-003: 056 por.

Figure 63. Plan view map of SIHP -2489B

Figure 64. Photograph of SIHP -2489B, view to northeast
4.4.2 SIHP #50-80-01-7144

<table>
<thead>
<tr>
<th>TEMPORARY #</th>
<th>CSH 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORMAL TYPE:</td>
<td>Terrace &amp; wall</td>
</tr>
<tr>
<td>FUNCTION:</td>
<td>Habitation</td>
</tr>
<tr>
<td># OF FEATURES:</td>
<td>5</td>
</tr>
<tr>
<td>AGE:</td>
<td>Post-contact (ca. mid-20th century)</td>
</tr>
<tr>
<td>DIMENSIONS:</td>
<td>7m (NE/SW) by 6m (NW/SE)</td>
</tr>
<tr>
<td>LOCATION:</td>
<td>Northeastern corner of the project area just makai of Kamehameha Highway</td>
</tr>
<tr>
<td>UTM Coordinates*:</td>
<td>2392829.33N, 596420.84E</td>
</tr>
<tr>
<td>TAX MAP KEY:</td>
<td>[1] 6-1-003: 056 por.</td>
</tr>
<tr>
<td>LAND JURISDICTION:</td>
<td>B. P. Bishop Estate Trust</td>
</tr>
</tbody>
</table>

SIHP #50-80-01-7144 is the remnant of a historic house site located within the northeastern corner of the project area just makai of Kamehameha Highway (see Figure 15 and Figure 16). The topography of the immediate area is gently sloping to the west, while the geology consists primarily of alluvial soil deposits with exposed basalt bedrock outcrops. Koa haole and exotic grasses dominate the surrounding landscape.

SIHP #50-80-01-7144 consists of five features which include: a terrace (Feature A), a wall (Feature B), an alignment (Feature C), and the remnants of a wastewater treatment system (Feature D and E) (Figure 65). Feature A is a terrace consisting of a stacked basalt boulder retaining wall abutting a soil slope, creating a level soil area (see Figure 65 and Figure 66). The retaining wall is constructed of stacked basalt boulders, is faced, and is 4 to 5 courses high. Of note is the presence of an automobile engine block and a cast iron sink constructed into the base of the northeastern portion of the wall. A large, approximately 1.2 diameter basalt boulder has been incorporated into the middle of the retaining wall. The entire terrace measures approximately 7 m long and 1.3 m wide, with a maximum height of 1.1 m.

Feature B is a short wall segment which extending perpendicularly from the southwestern end of Feature A (see Figure 65 and Figure 67). The wall is constructed of basalt and mortar and measures approximately 1.3 m long, 0.5 m wide, and 0.6 m high.

Feature C is a single course basalt boulder alignment which extends from the northwestern edge of Feature B toward the middle of Feature A, creating a small partially enclosed area measuring 3 m long by 2.5 m wide (see Figure 65). The alignment is approximately 3 m long and 0.2 m wide, with a maximum height of 0.35 m.

Feature D is located approximately 2 m northwest of Feature C, and consists of a concrete slab, measuring 1.4m², with a porcelain toilet attached. Sewer pipes leading into the ground are...
Results of Fieldwork

Archaeological Inventory Survey for Kawailoa Ahupua'a

Figure 66. Photograph of SIHP #50-80-01-7144 Feature A (terrace), view to southwest

Figure 67. Photograph of SIHP #50-80-01-7144 Feature B (basalt and mortar wall), view to southeast

Figure 68. Photograph of SIHP #50-80-01-7144 Feature D, concrete slab with attached toilet bowl, view to northeast
also present. Also of note is a collapsing cesspool (Feature E) located approximately 1.2 m northwest of Feature A. Currently the collapsing cesspool consists of a 0.5 diameter depression with a depth of 3.2 m below the existing surface.

Metal and glass fragments, likely associated with both historic and modern occupation of the area, were observed on the ground surface. The alluvial soils observed within the site may contain cultural deposits (i.e., buried household refuse) associated with historic occupation of the site. However, bulldozing was observed surrounding the immediate area and may have compromised any in situ cultural deposits that may be present. Thus excavation potential for SIHP #50-80-01-7144 is moderate.

SIHP #50-80-01-7144 is determined to be of post-contact origin. This is based on the construction techniques utilized at the site and the presence of metal and glass fragments scattered on the surface of the site and incorporated into the sites construction (i.e., historic refuse built into Feature A). Additionally, a 1954 Army Map Service topographic map indicates the presence of a dwelling in the same general area as SIHP -7144, providing further evidence that it is of post-contact origin (see Figure 11). The dwelling is also shown in detail on a historic Bishop Estate map of the area (Figure 69). The presence of nearby wastewater disposal facilities/structures (i.e., toilet and cesspool) and automobile and kitchen refuse indicate that SIHP -7144 was likely a remnant of a mid-20th century historic house site which was probably utilized into modern times.

SIHP #50-80-01-7144 maintains integrity of location and materials. The integrity of setting, feeling, design, workmanship, and association at the site has been compromised by bulldozing activities associated with historic and modern development. SIHP -7144 is recommended eligible to the Hawai‘i Register of Historic Places under Criterion D for the information it has yielded, or is likely to yield.
4.4.3 SIHP #50-80-01-7145

<table>
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<tr>
<th>TEMPORARY #</th>
<th>CSH 3</th>
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</thead>
<tbody>
<tr>
<td>FORMAL TYPE:</td>
<td>Terrace, dirt road, concrete foundations, and alignments</td>
</tr>
<tr>
<td>FUNCTION:</td>
<td>Habitation/transportation</td>
</tr>
<tr>
<td># OF FEATURES:</td>
<td>3</td>
</tr>
<tr>
<td>AGE:</td>
<td>Post-contact (ca. mid to late 20th century)</td>
</tr>
<tr>
<td>DIMENSIONS:</td>
<td>36m (NE/SW) by 25m (NW/SE)</td>
</tr>
<tr>
<td>LOCATION:</td>
<td>Southwestern corner of the project area just makai of Kamehameha Highway</td>
</tr>
<tr>
<td>UTM Coordinates*:</td>
<td>2392691.58N, 596319.3E</td>
</tr>
<tr>
<td>TAX MAP KEY:</td>
<td>[1] 6-1-003: 056 por.</td>
</tr>
<tr>
<td>LAND JURISDICTION:</td>
<td>B. P. Bishop Estate Trust</td>
</tr>
</tbody>
</table>

SIHP #50-80-01-7145 is the remnant of a historic house site located within the southwestern portion of the project area just makai of Kamehameha Highway and situated along the coast (see Figure 15 and Figure 16). The topography of the immediate area is level, while the geology consists primarily of alluvial soil deposits with exposed basalt bedrock outcrops. Coconut and banyan trees and exotic grasses are dominant vegetation in the immediate area.

SIHP #50-80-01-7145 consists of three features which include: a terrace (Feature A), a dirt road (Feature B), and a clearing containing modest stone alignments and concrete foundations (Feature C) (Figure 70). Feature A is a large soil terrace which was likely constructed through a combination of filling and grading via bulldozer. The makai (northwestern) edge of the terrace is lined with coconut trees and a discontinuous alignment of basalt boulders (Figure 71). The terrace roughly measures 25 m long by 20 m wide, and has a maximum height of 0.6 m. Feature A was likely constructed to create a level and stable ground surface to support a residential dwelling.

Feature B is a dirt road situated between Feature A and the coast (see Figure 70). It runs roughly northeast by southwest and its extent within the project area measures approximately 28 m long by 5 m wide. The road continues for an undetermined length beyond the southern boundary of the project area into a dense thicket of haole koa. The maka’a (eastern) and makai (western) edges of the road are demarcated by a line of coconut trees (Figure 72).

Feature C is located immediately north of features A and B and consists predominantly of a cleared area partially enclosed by exposed basalt outcrops to the north, east, and west (see Figure 70). Within this clearing are a modern shower, small concrete slabs/blocks, and modest stone alignments. The shower is constructed of a circular enclosure of basalt and coral cobbles, with a gravel paved interior (Figure 73). The enclosure has a diameter of 1.5 m, with a maximum height of 0.2 m. A metal pipe with an attached showerhead is fastened to a small palm tree which had been incorporated into the enclosure.
Figure 71. Photograph of SIHP #50-80-01-7145 Feature A (terrace), view to east

Figure 72. Photograph of SIHP #50-80-01-7145 Feature B (dirt road), view to northeast

Figure 73. Photograph of SIHP #50-80-01-7145 Feature C, view to north
Approximately 1 m northeast of the shower is a rectangular concrete slab measuring 1 m by 0.7 m (Figure 74). A single course basalt cobble alignment extends 0.5 m from the north end of the slab. The exact function of the concrete slab and alignment are unknown.

Approximately 6 m east of the shower is a small square enclosure measuring 1.5 m². The east side of the enclosure is a linear basalt outcrop, the west side is an alignment of basalt cobbles, the north and south sides consist of small rectangular concrete blocks. The exact function of the enclosure is unknown. Just north of the enclosure is a concentration of basalt outcrops, measuring approximately m by m. These outcrops are littered with modern construction debris as well as modern bottles and cans (Figure 75). A picnic bench is located just west of these outcrops.

Based on its geographic location along a beach, as well as the presence of a picnic bench and shower, Feature C was likely utilized as a recreation area. It probably provided access to the beach and was used as a location to bathe after exiting the ocean and for the consumption of food.

SIHP #50-80-01-7145 is determined to be of post-contact origin. This is based on the construction techniques utilized at the site. The presence of a modern shower facility/structure and modern refuse disposal (i.e., bottles and cans) indicate that SIHP #50-80-01-7145 was utilized into modern times.

SIHP #50-80-01-7145 maintains integrity of location and materials. The integrity of setting, feeling, design, workmanship, and association at the site has been compromised by bulldozing activities associated with historic and modern development. SIHP #50-80-01-7145 is recommended eligible to the Hawai‘i Register of Historic Places under Criterion D for the information it has yielded, or is likely to yield.
Section 5  Summary and Interpretation

5.1 Pedestrian Inspection

Pedestrian survey conducted during this archaeological inventory survey identified three historic properties: SIHP -2489, a discontinuous remnant of the O.R. & L. railroad berm; SIHP -7144, a post-contact habitation; and SIHP -7145, another post-contact habitation (see Figure 15, Figure 16, and Table 4). Observed site types consisted of terraces, a basalt and mortar wall, and an earthen railroad berm. Interpreted site functions included the following: habitation and transportation.

The pedestrian survey also noted extensive leveling and grading via bulldozer throughout the entire project area. A majority of this prior land disturbance is likely associated with the historic construction of the O.R. & L. railroad (SIHP -2489) and Kamehameha Highway. Leveling and grading via bulldozer associated with modern residential development was also observed within the northern boundary of the project area. The absence of pre-contact indigenous Hawaiian surface historic properties within the project area can be to these observed land disturbances.

5.2 GPR Survey

A GPR survey was conducted within the project area prior to subsurface testing in an attempt to define the local stratigraphy and to prospect for buried cultural deposits. Due to dense vegetation and uneven ground surfaces only two discrete locations within the southern portion of the project area were surveyed with GPR (see Figure 18).

The GPR survey identified numerous subsurface anomalies which were visible down to 100 cm below the existing ground surface. The anomalies were of varying size, distribution, and prominence. Based on soil survey data (see Section 1.4 above; Foote et al. 1972) most of the observed anomalies were anticipated to be associated with basalt boulders or the presence of shallow bedrock. Test excavation confirmed this initial interpretation.

Based on the combined results of the GPR survey and subsurface testing, GPR survey appears to not be a suitable remote sensing technology within the project area and vicinity. The extensive basalt boulders and cobbles within the naturally occurring soil have the potential to generate subsurface anomalies which obscure the more ephemeral anomalies that would correspond to cultural deposits, in effect masking them from view. The determination of low GPR suitability is consistent with the NRCS, which has also determined that GPR has a “low suitability” within the project area (see Figure 6).

5.3 Subsurface Testing

14 backhoe trenches were excavated within the project area to assess project area stratigraphy and potential for subsurface cultural deposits. All of the trenches were distributed within four lots delineated by the project developer (Group 70 International, Inc.), as areas anticipated for subsurface disturbance in the form of septic tanks and leach field installation (see Figure 33 and Figure 34). The amount of trenches and their special distribution were limited by dense vegetation present throughout a majority of the project area.

Based on backhoe testing results, the stratigraphy within the project area is largely as expected. In general the observed and documented stratigraphy consisted of naturally deposited alluvial sediment deposited atop relatively shallow basalt bedrock. This pattern deviated slightly within the southern portion of the project area (see Trenches 12-14 below) where fill material was observed capping the naturally deposited alluvial sediment. This was expected as this portion of the project area consisted of a large level soil terrace (SIHP -7145A) likely utilized as a post-contact house foundation (see Section 4.4 below).

Trench 11, situated within the northeastern corner of the project area, also yielded findings deviating from the norm. Stratigraphy within this trench consisted of a single stratum defined by large basalt boulders with thin pockets of silt. This indicated that the immediate area was artificially built up and leveled, likely utilized as a post-contact foundation associated with SIHP -7144 (a post-contact habitation; see Section 4.4 below), located 4 m to the northwest.

Also of note was the presence of earthen berm construction, associated with the O.R. & L. railroad (SIHP -2489), observed within Trenches 1, 8, 12, and 14. Based on trench stratigraphy, O.R. & L. railroad berm construction within the project area consisted of moulded sandy clay loam deposited atop a sand base course.
Section 6  Significance Assessments

6.1 Significance Assessments

The historic properties identified by the current study were evaluated for significance according to the broad criteria established for the National and Hawai‘i Registers of Historic Places. The five criteria are:

A  Associated with events that have made an important contribution to the broad patterns of our history;
B  Associated with the lives of persons important in our past;
C  Embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, or possesses high artistic value;
D  Have yielded, or is likely to yield information important for research on prehistory or history;
E  Have an important value to the native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property, or due to associations with traditional beliefs, events or oral history accounts – these associations being important to the group’s history and cultural identity (Hawaii Register only).

SIHP #50-80-01-2489, a remnant of the O.R. & L. railroad berm, has integrity of location, and is recommended eligible to the Hawai‘i Register under criteria D.

SIHP #50-80-01-7144, a post-contact habitation site, has integrity of location and materials, and is recommended eligible to the Hawai‘i Register under criteria D.

SIHP #50-80-01-7145, a post-contact habitation site, has integrity of location and materials, and is recommended eligible to the Hawai‘i Register under criteria D.

Section 7  Project Effect and Mitigation Recommendations

The following project effect discussion and cultural resource management recommendations are intended to facilitate project planning and support the proposed project’s required historic preservation consultation. This discussion is based on the results of this archaeological inventory survey investigation and CSH’s communication with the project proponent (Group 70 International, Inc.).

7.1 Project Effect

CSH’s project specific effect recommendation is “effect, with proposed mitigation commitments.” The recommended mitigation measures will reduce the project’s effect on yet to be identified subsurface historic properties that may be located within the project area and be proactive in addressing possible community concerns.

7.2 Mitigation Recommendations

Previous archaeological investigations have identified numerous pre-contact historic properties in the immediate vicinity of the project area including: heiau, a fishing shrine, a sacred stone, subsurface cultural deposits (middens & artifacts), and platforms (McAllister 1933; Athens & Shun 1982). Previous archaeological investigations have also identified post-contact historic properties in the vicinity of the project area primarily associated with OR&L railroad infrastructure (bridges, railroad beds, etc.). The current investigation identified two post-contact habitation sites (SIHP -7144 & -7145) and a remnant of the O.R. & L. railroad berm. Thus it is very likely that subsurface historic properties, associated with both pre- and post-contact land use, are present within the project area in the form of cultural layers and/or structural remnants buried by modern and/or historic fill layers. In order to mitigate the potential damage to these potential historic properties within the project area, it is recommended that project construction proceed under an archaeological monitoring program. The specifics of this monitoring program will be addressed in an archaeological monitoring plan to be reviewed and approved by the State Historic Preservation Division. This monitoring program will facilitate the identification and proper treatment of any burials that might be discovered during project construction, and will gather information regarding the project’s non-burial archaeological deposits, should any be discovered.

No further historic preservation work is recommended for SIHP #’s 50-80-01-2489, 50-80-01-7144, and 50-80-01-7145. Sufficient information regarding the location, function, age, and construction methods of these historic properties has been generated by the current inventory survey investigation to mitigate any adverse effect caused by proposed development activities.
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Appendix A  LCA Documentation

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Archaeological Inventory Survey for the Kāpūlele/Cultural Learning Project at Kawaiola Ahupua‘a

TMK 6-1-003: 056 por.
## Archaeological Inventory Survey for the Pu'ukohola Heiau National Historic Site

**Project:** Pu'ukohola Heiau National Historic Site

**Survey Area:** Kawailoa Ahupua'a

### Site Description

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### Cultural Surveys Hawai'i

**Job Code:** KAWAILOA

**Documentation:** LCA

**Archaeological Inventory Survey for Kawailoa Ahupua'a**

**TMK:** [1] 6-1-003: 056 por.

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**Site No.:** 1

**Location:** Kawailoa Ahupua'a

**Date:** January 30, 1988

**Description:**

- Site No.: 1
- Location: Kawailoa Ahupua'a
- Date: January 30, 1988

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**Location:** Kawailoa Ahupua'a

**Date:** January 30, 1988

**Description:**

- Site No.: 2
- Location: Kawailoa Ahupua'a
- Date: January 30, 1988

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**Site No.:** 3

**Location:** Kawailoa Ahupua'a

**Date:** January 30, 1988

**Description:**

- Site No.: 3
- Location: Kawailoa Ahupua'a
- Date: January 30, 1988

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Archaeological Inventory Survey for the Kīpapau Cultural Learning Project at Kawaiola Ahupua'a

A-4

TMK (1) 6-1-003: 056 pc.
Cultural Surveys Hawai'i Job Code: KAWAILOA 1 LCA Documentation

Archaeological Inventory Survey for the KipukaLoa Cultural Learning Project at Kawaiola Ahupua'a

A-6

Archaeological Inventory Survey for the KipukaLoa Cultural Learning Project at Kawaiola Ahupua'a

A-7
## Archaeological Inventory Survey for the Kipuulei Cultural Learning Project at Kawailoa Ahupua'a

### A-8

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<td>Sugar Cane</td>
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<td>Tobacco</td>
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### A-9

#### Kawala Haupua'a

- **Makiki, aina o Kahului**
  - **Area 1:** Makiki, aina o Makiki
  - **Area 2:** Makiki, aina o Kalahiki

#### Kawalalo Haupua'a

- **Makiki, aina o Kahului**
  - **Area 1:** Makiki, aina o Makiki
  - **Area 2:** Makiki, aina o Kalahiki

#### Kawalilo Haupua'a

- **Makiki, aina o Kahului**
  - **Area 1:** Makiki, aina o Makiki
  - **Area 2:** Makiki, aina o Kalahiki
Archaeological Inventory Survey for the Kilipalolo Cultural Learning Project at Kawailoa Ahupua'a

TMK: [1] 6-1-003: 023, 027, 028, 039, 041, & 056
APPENDIX F

Cultural Impact Analysis

Cultural Surveys Hawaii, Inc.

May 2011
Prefatory Remarks on Language and Style

A Note about Hawaiian and other non-English Words:
Cultural Surveys Hawai'i (CSH) recognizes that the Hawaiian language is an official language of the State of Hawai'i, it is important to daily life, and using it is essential to conveying a sense of place and identity. In consideration of a broad range of readers, CSH follows the conventional use of italics to identify and highlight all non-English (i.e., Hawaiian and foreign language) words in this report unless citing from a previous document that does not italicize them. CSH parenthetically translates or defines in the text the non-English words at first mention, and the commonly-used non-English words and their translations are also listed in the Glossary (Appendix A) for reference. Where possible, CSH also provides information about the context and usage of the Hawaiian and other non-English words to help readers understand their meaning in the specific contexts in which they are used.

A Note about Plant and Animal Names:
When community participants mention specific plants and animals by Hawaiian, other non-English, or common names, CSH provides their possible scientific names (Genus and species) in the Common and Scientific Names of Plants and Animals Mentioned by Community Participants (Appendix B). CSH derives these possible names from authoritative sources, but since the community participants only name the organisms and do not taxonomically identify them, CSH cannot positively ascertain their scientific identifications. CSH does not attempt in this report to verify the possible scientific names of plants and animals in previously published documents; however, citations of previously published works that include both common and scientific names appear in the original texts.
### Cultural Impact Assessment for the Kamehameha Schools, Waialua District, Oahu

#### Project Description

Kamehameha Schools proposes to improve their cultural learning project near the northwestern coast of Oahu. The project area consists of one parcel located along the northwestern coast of Oahu. It comprises TMK: [1] 6-1-003: por. 056, and is bounded by Kamehameha Highway to the east, the Pacific Ocean to the west, and Waimea Bay to the north. This area is depicted on the 1998Waimea USGS 7.5-minute topographic quadrangle.

#### Project Location

The Project area consists of one parcel located along the northwestern coast of Oahu. It comprises TMK: [1] 6-1-003: por. 056, and is bounded by Kamehameha Highway to the east, the Pacific Ocean to the west, and Waimea Bay to the north. This area is depicted on the 1998Waimea USGS 7.5-minute topographic quadrangle.

#### Area of Potential Effect (APE)

The Area of Potential Effect (APE) for this Cultural Impact Assessment (CIA) includes the approximately 3.48-acre project site. The APE also includes all areas that are or may be traditionally associated with or connected to the Project area, such as traditional fishing sites, cultural features, and areas of cultural significance. The APE may extend beyond the boundaries of the project site to include areas that are integral to the cultural significance of the Project area.

#### Results of Background Research

Background research for this Project yielded the following results:

1. In pre-Contact and early historic times, the Project area was part of a fishing village, or a scattering of small fishing villages, extending from the west side of Waimea Bay back towards Waialua. This area along the coast—today the northernmost extent of Kawailoa Ahupua’a—was known as the Makai area, which included a once-thriving fishing community and associated cultural features.

2. The Project area is located near the northernmost extent of Kawailoa Ahupua’a, a traditional coastal area that includes historic fishing sites, cultural features, and areas of cultural significance.

3. The Project area is located near the northernmost extent of Kawailoa Ahupua’a, a traditional coastal area that includes historic fishing sites, cultural features, and areas of cultural significance.

#### Community Consultation Effort

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 culture and traditions associated with the Project area. The organizations consulted included the Kamehameha Schools, the Office of Hawaiian Affairs (OHA), the Oahu Island Burial Council (OIBC), and community and cultural organizations including the Waialua Hawaiian Civic Club.

#### Date

May 2011

### Management Summary

<table>
<thead>
<tr>
<th>Reference</th>
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| Cultural Impact Assessment for the Kamehameha Schools, Waialua District, Oahu | KAWAILOA 5 | The Project area consists of one parcel located along the northwestern coast of Oahu. It comprises TMK: [1] 6-1-003: por. 056, and is bounded by Kamehameha Highway to the east, the Pacific Ocean to the west, and Waimea Bay to the north. This area is depicted on the 1998Waimea USGS 7.5-minute topographic quadrangle. | Kamehameha Schools proposes to improve their cultural learning project near the northwestern coast of Oahu. The project area consists of one parcel located along the northwestern coast of Oahu. It comprises TMK: [1] 6-1-003: por. 056, and is bounded by Kamehameha Highway to the east, the Pacific Ocean to the west, and Waimea Bay to the north. This area is depicted on the 1998Waimea USGS 7.5-minute topographic quadrangle. | Approximately 3.48 acres | The Area of Potential Effect (APE) includes the approximately 3.48-acre project site. The APE also includes all areas that are or may be traditionally associated with or connected to the Project area, such as traditional fishing sites, cultural features, and areas of cultural significance. The APE may extend beyond the boundaries of the project site to include areas that are integral to the cultural significance of the Project area. | Background research for this Project yielded the following results:

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3. The Project area is located near the northernmost extent of Kawailoa Ahupua’a, a traditional coastal area that includes historic fishing sites, cultural features, and areas of cultural significance. |
2. The Project area is uniquely situated in close proximity to four significant religious sites: a large heiau (temple), Kupopolo, which is associated with Ka'opoulu, the last O'ahu-born Kahuna Nui (high priest and councilor to a high chief) of the island; the famous fish-attracting shrine of Kea'ouhiānu‘u on a celebrated rocky point, which appears in the famous song-cycle narrative of Hi'aka'a's travels, and is also associated with mo'olelo (stories, oral traditions) about Käne'aukai, a fish (or sometimes shark) god; a sacred pōhaku (stone), Kaakahii, a tongue-shaped stone marking the ahupua‘a (land division from the mountains to the sea) boundary between Waimana and Kawaiola (McAllister 1933:146); and Pu‘u o Mahuka Heiau at Pūpākea, which Ka'opoulu reportedly ordered it to be built after Kupopolo failed to serve its primary purpose of serving as a place where he could have visions.

3. Previous archaeological surveys and mapping by the Bishop Museum place three historic properties near the current Project area (a concrete foundation and stone wall within an associated midden deposit containing indigenous Hawaiian artifacts, a complex of stone and earthen platforms possibly of post-Contact origin, and a segment of an Oahu Railway and Land Company (OR&L) railroad berm (Athens and Shun 1982), as well as ten archaeological sites along the northeastern border of the Project that contain numerous pre-Contact artifacts (Athens and Shun 1982. Welch 1981). The accompanying AFS conducted by CSH (Tulchin and Hammat 2011) identified a discontinuous segment of the OR&L berm (SHIP No. 50-80-01-2499) and two post-Contact habitation sites (SHIP No. 50-80-01-7144 and -7145) in the Project area.

4. Human remains were discovered on the inland side of Kamehameha Highway approximately 400 meters southwest of the present Project area (Bath 1988). This stretch of coast tends to be rocky and lacking in Jaucas sand deposits as is the coast in the immediate vicinity of the Project area. It is unclear at this time whether this burial find was anomalous or whether burial in terrigenous soils was a pattern where Jaucas sand beach deposits were not available. There is no documented evidence from archaeological surveys, historic records or oral traditions of ilina (burials) or nei kāpuna (ancestral bone remains) within the Project area.

5. Beginning in the early 1800s, the sandalwood trade initiated economic and cultural transformations in Waialua Moku. The demands put on the maka‘āinana (commoners) to harvest wood for trade caused many taro fields to become fallow. As the sandalwood trade collapsed in the 1830s, Protestant missionaries were establishing their presence in Waialua. In the later half of the 1800s, Chinese immigrants began to cultivate rice in areas that taro had once thrived. In 1892, there were 180 acres under rice cultivation in Waialua Moku, including Kawaiola (Coulter and Chun 1937:12, 21) but not Kāpelaos, which is too dry.

6. During the Māhele (division of Hawaiian lands) in 1848, nearly the entire ahupua‘a of Kawaiola was awarded to Victoria Kamāmalu (Land Commission Award [LCA] 7713). During the second half of the nineteenth century, following the death of Kamāmalu in 1866, Kawaiola Ahupua‘a was passed on to successive members of the ali‘i (chiefs). The B.P. Bishop Estate Trust presently retains ownership of most of the ahupua‘a of Kawaiola.

7. LCA documentation indicates a wide range of indigenous Hawaiian subsistence activities being practiced in the vicinity of the Project area. The kuleana (Native Hawaiian land rights) data indicate a settlement pattern where households had multiple ʿapana (parcels) in different geographical locations, with the immediately coastal ʿapana being utilized for fishing and habitation and manu (inland) ʿapana being used as kula (open country, pasture) to cultivate sweet potatoes. Additionally, pali (cliffs, slopes) were being exploited for the collection of wānke (paper mulberry) and hala (pandanus).

8. The OR&L, which connected outlying areas of O‘ahu to Honolulu, reached Waialua in 1898 (Kuykendall 1967:100), and ran through the northern half of the Project area (USGS 1929). In 1899, Dillingham, capitalizing on the increasing numbers of visitors to the north shore of O‘ahu, opened the two-story Hale‘iwa Hotel at Waialua Bay in 1899. The railroad also spurred large-scale sugar farming in Waialua. From about 1900 to the 1950s, the Waialua Agricultural Company, later named Waialua Sugar Company, expanded to eventually reach more than 12,000 acres, including a large portion of Kawailoa.

9. Previously recorded oral histories depict the changing composition of Waialua with the sugar industry and tourism (UH 1977). The personal stories of Philip Ninomiya (from Japan) and Mamu Nonaka (from Portugal) convey the value of natural resources to local diets (e.g. fish and semi-wild fruit.
Cultural Impact Assessment for Project Area

### Community Consultation

Mr. Helemano, a local resident, describes Kahaluu Heiau as a settlement area where people lived for over 1000 years. He also mentions the importance of kawa, or kava, in the area. Kahaluu Heiau was a significant site for cultural and social activities.

<table>
<thead>
<tr>
<th>Community Consultation</th>
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</tr>
</tbody>
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### Results of Cultural Surveys

- **Kawailoa Area:** Mr. Helemano and Mr. Becket identified Kupopolo Heiau and Ke Ahu Hapu'U Heiau as important cultural sites. In the same location, Ms. Cannon does not have any pre-Contact features; however, based on his discoveries about 25 years ago of many modern cultural materials, he suggests that the Project area may have been used as an informal dumping site in the post-Contact era.

- **Kawaheka area:** Mr. Becket lists nineteen documented, significant pre-Contact sites that stretch from Waimea to Hale'iwa. He also describes a few less-known features he has photographed within the area.

- **Future Site:** Mr. Topolinski similarly comments that the area was famous for its ancient prophets and seers, and was tied with kahuna and cultural resources. Mr. Helemano also describes well-known figures in the area from this time, including Ka'opulupulu, the officiating ali'i at Keahole, and Christmas, who was a famous mermaid who lived in Kealakekua Bay.

### Management Summary

Cultural surveys conducted in the Project area highlighted the importance of cultural resources and historical significance. The information gathered is crucial for understanding the local culture and history, and for making informed decisions about the management of the area.

<table>
<thead>
<tr>
<th>Management Summary</th>
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<tr>
<td>Cultural surveys conducted in the Project area highlighted the importance of cultural resources and historical significance. The information gathered is crucial for understanding the local culture and history, and for making informed decisions about the management of the area.</td>
</tr>
</tbody>
</table>
Cultural Surveys Hawai‘i Job Code: KAWAIOLA5

Management Summary

5. The Project area and environs are sources of plants that are particularly valuable resources for food, medicine, ornament, and other uses. Most community participants focus on *limu* (algae), specifically the *limu kohu* (brown alga), which they describe as abundant and even the old Hale‘iwa IGA and Fujioka’s grocery stores used to sell *limu kohu* plentiful and that even the old Hale‘iwa IGA and Fujioka’s grocery stores used to sell. Ms. Canon mentions Hawaiian Flagtail (*ha‘uki‘uki*), which was harvested from brackish water in Lokoea Fishpond. Mrs. Awai-Lennox’s family gathered *limu kohu* and *limu koi* (Japanese cup) at their family beach when they were growing up and that the method of uprooting it (instead of cutting it) is detrimental.

7. Birds are another important cultural resource in the area. Mrs. Awai-Lennox describes peacocks and wild turkeys as abundant and hunted, and she and Mr. Orr mention the *ala nui* (Common Hawaiian Moth) which is rare but still found in health areas in Kawaiola (not the Project area itself).

8. Participants describe specific uses for land in the Hale‘iwa area and are concerned with how-she and her other neighbors get to ride the rail or to last case before Waianae Sugar switched to transporting their sugar cane from their track as she and her siblings swam in Anahulu Stream.

9. The OR&L Company is a common thread woven into the memories of community members. Mrs. Causey describes the old railroad track as running right in front of their family home and recalls how she and her other neighbors got to ride the rail to last case before Waianae Sugar switched to transporting their sugar cane from their track as she and her siblings swam in Anahulu Stream. She explains that the railroad enabled people to come and visit the area and that it was bulldozed over to make the railroad."
In terms of the cultivation and propagation of plants on the Project site, Mr. Helmano and Mr. Orr say that Ka'ena Point is a good model. Mrs. Awai-Lennox suggests culturally valuable plants such as naupaka, hele, and ilima. Mr. Lyons and Mr. Helmano recommend that the Project should benefit and be open to all local people and all Hawaiians and not just those who belong to a particular school or entity. Ms. Canon recommends incorporating an educational aspect to the Fishpond, too. When staffing the Learning Center, Mrs. Cousey suggests “consider[ing] local people, instead of hiring from the mainland.” Mrs. Awai-Lennox recommends KS restore the use of the old Hawaiian place names in the area. Thinking of the larger context for the Project area, Mr. Becket initially recommended that Kamehameha Schools acquire the Holt property in order to preserve the complex of pre-Contact features. When CSH spoke with Mr. Becket on October 2, 2010, he said the property had already been purchased.

**Impacts and Recommendations**

Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, CSH foresees potential impacts of the proposed Project on Native Hawaiian or other ethnic groups’ cultural practices customarily and traditionally exercised for subsistence, cultural or religious purposes, and on cultural, historic, and natural resources. To avoid these potential impacts, CSH recommends:

1. Land-disturbing activities may uncover burials or other cultural resources. Previous archaeological surveys and mapping by the Bishop Museum place three historic properties within the current Project area and numerous archaeological sites and artifacts along the northeastern border of the Project area (Athens and Shun 1982; Welch 1981). The results of the accompanying AIS indicate three historic properties in the Project area with the high likelihood of subsurface cultural layers and/or structural remnants in the Project area (Tulchin and Hammatt 2011). Human remains were discovered southwest of the Project area (Bath 1988). In addition, community consultation indicates that post-Contact artifacts may be located in the Project area. Should historic, cultural or burial sites or artefacts be identified during ground disturbance, all work should immediately cease and the appropriate agencies notified pursuant to applicable law.

2. Native Hawaiians and others practice their cultural activities (e.g., shore and reef fishing, marine recreation) in and near the Project area and immediate vicinity. Kamehameha Schools should implement best management practices to allow continued access to the shoreline for these and other cultural activities. Kamehameha Schools should brief and consult local community members and organizations as the Project design progresses. Consultation will keep the community informed of any changes that could result in unanticipated adverse cultural impacts.
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Introduction

1.1 Project Background

The Project area is located along the northwestern coastline of the island of O‘ahu. It is located approximately 280 meters (0.2 miles) southwest of Waimea Bay, and approximately 1.2 km (0.75 miles) northeast of Kamehameha Schools’ Hui‘iao Ahupua‘a, Waialua District, O‘ahu. TMK: [1] 6-1-003: 056 por.

Kamehameha Schools proposes to improve that Kakeha Kai (kau) (the ocean) property currently vacant. The Kakeha Kai School, Kakeha Kai Cultural Learning Project conceptual plan includes an outdoor activity lawn, an educational native Hawaiian garden, off-street parking, and support infrastructure. The primary purpose will be a school facility for school children (grades K-12) enrolled in the Hui‘iao Ahupua‘a charter school. Associated ground disturbance will include excavation related to structural footings, utility installation, roadway and parking area installations, and landscaping.

The Project area potentially affects approximately 3.48 acres. The study area includes the Project area’s relationship with the rest of the island and its environs. The Project’s area of potential effects (APE) is defined as the entire approximately 3.48-acre Project area. The APE includes structural disturbance and associated ground disturbance. The Project is bounded by Kamehameha Highway to the north, the Pacific Ocean to the southwest, Wai‘anae Ridge to the northwest, and Waimea Bay to the northeast. (See 1990 Wai‘alea U.S.G.S. 7.5-minute topographic quadrangle, a Tax Map Key (TMK), and an aerial photograph (Figure 1, Figure 2). The Project area is depicted on the north shore, consists of TMK: [1] 6-1-003: por. 056; it is bounded by Kamehameha Highway to the north, the Pacific Ocean to the southwest, Wai‘anae Ridge to the northwest, and Waimea Bay to the northeast. (See 1990 Wai‘alea U.S.G.S. 7.5-minute topographic quadrangle, a Tax Map Key (TMK), and an aerial photograph (Figure 1, Figure 2). The Project area is depicted on the north shore, consists of TMK: [1] 6-1-003: por. 056. A surf break and public park known as Uppers is located southwest of the Project area. A set of small islets and large rocks are located approximately 280 meters (0.2 miles) southwest of Waimea Bay, and approximately 1.2 km (0.75 miles) northeast of Kamehameha Schools’ Hui‘iao Ahupua‘a, Waialua District, O‘ahu. TMK: [1] 6-1-003: 056 por.

The Project is being reviewed under HRS Chapter 6E–42 and the Hawai‘i Administrative Rules Chapter 13–284. The document is intended to support the Project’s environmental review and may also serve to contribute to the environment review under HRS Chapter 6E–42 and Hawai‘i Administrative Rules Chapter 13–284.

1.2 Document Purpose

This Cultural Impact Assessment (CIA) is intended to support the Project’s environmental review and may also serve to contribute to the environment review under HRS Chapter 6E–42 and Hawai‘i Administrative Rules Chapter 13–284.

The scope of work for this CIA includes:

1. Examination of cultural and historical resources, including Land Commission documents, historical maps, and previous research reports, with the specific purpose of identifying traditional Hawaiian activities that may be included in the historical record.

2. Review of previous archaeological work at and near the parcel that may be associated with the parcel, and/or other resources and practices near the parcel that may be associated with the parcel and/or other resources near the parcel that may be associated with the parcel.

3. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

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The document includes an outdoor activity lawn, an educational native Hawaiian garden, off-street parking, and support infrastructure. The primary purpose will be a school facility for school children (grades K-12) enrolled in the Hui‘iao Ahupua‘a charter school. Associated ground disturbance will include excavation related to structural footings, utility installation, roadway, and parking area installation, and landscaping.

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Conservation Sanctuary (overseen by the Department of Land and Natural Resources) which extends across Waimāna Bay to the northeast.

Just southeast of the Project area, on the mauka (toward the mountain) side of the Kamehameha Highway, a steep pali (cliff) rises up onto the gently sloping uplands of Kāpāloa. These uplands were completely transformed by commercial sugarcane activities which, until relatively recently, more or less covered the area. As discussed in detail below, the famous Kūpōpōlo Heiau is located between the Kamehameha Highway and the pali in proximity to the Project area.

According to U.S. Department of Agricultural (USDA) soil survey data (Foote et al. 1972), Project area sediments consist of Waialua Stony Silty Clay (WIB) and Kaena Very Stony Clay (KaEn) (Figure 6). Soils of the Waialua series consist of “moderately well drained soils on alluvial fans...developed in alluvium weathered from basic igneous rock...used for sugarcane, truck crops, orchards, and pasture” (Foote et al. 1972). Soils of the Kaena series consist of “very deep, poorly drained soils on alluvial fans and talus slopes...developed in alluvium and colluvium from basic igneous material...used for sugarcane, truck crops, pasture, and homesites” (Foote et al. 1972).

There are no streams or drainages in the Project area, but there may have once been some fresh-water runoff available from the drainage of the elevated uplands to the southeast. The Project area receives between 1000 millimeters (39 inches) and 1500 millimeters (59 inches) of annual rainfall (Giambelluca et al. 1986). Where not transformed by residential construction, the Project area vegetation consists primarily of introduced invasive plants such as haole koa (Leucaena spp.). (See Table 4, Section 8 for a more extensive list of plant species in the Project area)

Figure 1. Recreational fishing at edge of Project area (CSH July 21, 2010)

1.4.2 Built Environment

Most of the Project area is undeveloped. A few residential dwellings in the southwestern portion of the Project area existed when the Project began but have since been removed. Grading and subsurface utilities are present in the vicinity of the residential dwellings.

Figure 2. Project area from Hale‘iwa side with Wānānapoa Islets in background (CSH July 21, 2010 CSH)
Figure 3. U.S. Geological Survey (USGS) 7.5-Minute Series topographic map, Waimea Quadrangle (1998), showing the location of the Project area

Figure 4. TMK (1) 6-1-003, showing the location of the Project area
Introduction

Figure 5. Aerial photograph showing the location of the Project area (USGS Orthoimagery 2005)

Figure 6. Overlay of Soil Survey of the State of Hawai‘i (Foote et al. 1972), indicating sediment types within the Project area
2.1 Archival Research

Archival resources, maps, and existing archaeological information pertaining to Kawailoa were researched at the Hawaii State Archives, the State Land Survey Division, the archives of the Bishop Museum, and the archives of the Bishop Museum. CSH also focused on obtaining in-depth information about people who live in the study area. For example, we contacted the SHPD, Office of Hawaiian Affairs (OHA), O'ahu Island Burial Council (OIBC), and other appropriate community representatives and members. Based on their in-depth knowledge of the study area, CSH initiated unstructured and semi-structured interviews (as described by Bernard 2006:25) to explore community knowledge, resources, burials, trails, historic properties and people with cultural knowledge. For cultural studies, research for the Traditional Background section centered on Hawaiian place names and no'eau (proverbs) and more. For the Historic Background section research focused on land use and settlement patterns, gathering practices and activities including: religious and ceremonial knowledge and practices; traditional subsistence knowledge (e.g., mele (oral-historical accounts), mo'olelo (songs), oli (chants), mele mele (songs); D'66 (chants); koa (songs); and mo'olelo (songs)).

2.2 Community Consultation

Typically this means three to twelve interviews. For natural resources, the interview purpose, the intent of the study and how his/her information will be used; (2) the researcher gave him/her a copy of the Authorization and Release Form to read and sign (Appendix A); (3) if the person agreed to participate by way of signing the consent form, he/she was asked to provide oral consent; the researcher started the interview; (4) the interviewee received a copy of the Authorization and Release Form for his/her records, while the original is stored at CSH; (5) after the interview was summarized at CSH (and possibly transcribed in full), the study participant was afforded an opportunity to review the interview notes (or transcription) and summary and to make any corrections, deletions or additions to the substance of their testimony/oral history interview; this right to view the report on the OEQC website and offered a hardcopy of the report once the corrections, deletions or additions to the substance of their testimony/oral history interview; this report is a public document. To assist in discussion of natural and cultural resources and cultural practices specific to the study area, CSH initiated unstructured and semi-structured interviews (as described by Bernard 2006). Focus groups were also conducted in and around Kawailoa for their brief response/review of the Project and to identify individuals with cultural knowledge. The interview protocol is tailored to describe the qualitative methods as “a kind of measurement, an integral part of the complex transformation, development and population changes beginning in the early post-European transformation, development and population changes beginning in the early post-European...”. The interview protocol is tailored to describe the qualitative methods as "a kind of measurement, an integral part of the complex transformation, development and population changes beginning in the early post-European...".
the specific natural and cultural features of the landscape in the study area identified through archival research and community consultation. These interviews and oral histories supplement and provide depth to consultations from government agencies and community organizations that may provide brief responses, reviews and/or referrals gathered via phone, email and occasionally face-to-face commentary.

2.2.3.1 In-depth Interviews and Oral Histories

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

2.2.3.2 Field Interviews

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

Building on open-ended and semi-structured approaches, field interviews included the structured methods enumerated in the above section. Participants helped to identify significant cultural and natural features of the landscape and to create a “cultural landscape map” (see Figure 41. Cultural Landscape Map) by surveying the Project area and/or other relevant sites in proximity with the researcher, identifying significant sites on aerial photographs of the area, and providing GPS points for other significant sites.

2.3 Compensation and Contributions to Community

Many individuals and communities have generously worked with CSH over the years to identify and document the rich natural and cultural resources of these islands for cultural impact, ethno–historical and, more recently, TCP studies. CSH makes every effort to provide some form of compensation to individuals and communities who contribute to cultural studies. This is done in a variety of ways: individual interview participants are compensated for their time in the form of a small honorarium and/or other makana (gift); community organization representatives (who may not be allowed to receive a gift) are asked if they would like a donation to a Hawaiian charter school or nonprofit of their choice to be made anonymously or in the name of the individual or organization participating in the study; contributors are provided their transcripts, interview summaries, photographs and—when possible—a copy of the CIA report; CSH is working to identify a public repository for all cultural studies that will allow easy access to current and past reports; CSH staff do volunteer work for community initiatives that serve to preserve and protect historic and cultural resources (for example in, Lāna‘i, Waimānalo, and Kabo‘olawo). Generally our goal is to provide educational opportunities to students through internships, share our knowledge of historic preservation and cultural resources and the State and Federal laws that guide the historic preservation process, and through involvement in an ongoing working group of public and private stakeholders collaborating to improve and strengthen the Chapter 343 environmental review process.
Section 3 Traditional Background

3.1 Overview

In pre-Contact and early historic times, the Project area was part of a fishing village, or a scattering of small fishing villages, extending from the west side of Waimea Bay back towards Wai'ahau. This area along the coast appears to have been a kind of outlier (or hinterlands) under the influence or control of larger settlement and agricultural areas of Wai'ahau. Multiple lines of ethno-historical and documentary evidence suggest it has always been closely associated with Wai'ialua Moku rather than Waimea or lands to the northeast (i.e., Ko'olauloa Moku). Prior to the middle nineteenth century land reforms known as the Māhele, the Project area lands were attached to Kamananui Ahupua'a to the west. Other sources (e.g. Kamehameha Schools 1987) depict a relatively small ahupua'a in pre-Māhele times called Kāpa'elo (Figure 7). In most references (e.g. LCAs) Kāpa'elo is considered an ‘ili (land division smaller than an ahupua’a) of either Kāpa'elo or (in the early nineteenth century) Kamananui Ahupua’a. The spelling in this report follows Kamehameha Schools (1987) (Kāpa'elo) unless citing previous sources that use the alternative spelling (Kapaeloa).

In any case, and regardless of its shifting political allegiances through time, the Kāpa'elo coast has always been known as a relatively dry place, generally unsuitable for wet-taro cultivation, but ideal for its access to marine resources and deep-sea fisheries. The Project area, in specific, is located immediately adjacent to the ahupua’a boundary with the sacred valley of Waimea to the northeast; and several important cultural resources and wahi pana are situated along this boundary line—which is also the moku boundary between Wai'ialua and Ko'olauloa—extending out to the small rocky point or bluff known as Ke'ouhi (or Keua'hi'u). This celebrated rocky point, which appears in the famous song-cycle narrative of Hi'iaka’s travels, is also associated with mo'olelo about Kane’aukai, a fish (or sometimes shark) god whose shrines (ko'a or circular piles of stone and/or ki'a or stones) were built here. Ke'ouhi (or Keua'hi'u) is eligible to be recognized as a traditional cultural property. Extending back mauka from this point, about halfway between the seashore and the steep pali, is Kupopolo Heiau, which is associated with a number of important historic and proto-historic figures including Ka'opulupulu, the last O'ahu-born Kahuna Nui (supreme spiritual leader) of the island, and wahi pana, including Pu‘u o Mahuka Heiau at Pāpūkea.
3.2 Place Names

In general, Hawaiian place names convey a wide variety of information about the relationships between people, landscapes and other natural and cultural resources. Place names may also express cultural, historical and/or spiritual values and concepts important to Hawaiian world views. It is common for places and landscape features to have multiple names, some of which may only be known to certain 'ohana (families) or even certain individuals within 'ohana, and many of which have been lost, forgotten and/or kept secret through time. Place names may also convey kaua (hidden meaning(s)) and/or huna (secret) information that may even have political or subversive undertones.

Before the introduction of writing to the islands, when cultural information was exclusively preserved and perpetuated orally, Hawaiians gave names to literally everything in their environment, including individual garden plots and 'a'ana (irrigation ditches), house sites, intangible phenomena such as meteorological and atmospheric effects, pōhaku (rocks), pānāwai (fresh-water springs), and many others (cf. Handy and Handy 1972; Pukui et al. 1974; Pukui 1986; Sterling and Summers 1978).

The following discussion dealing with place names and their meanings is organized according to proximity to the proposed Project area, starting with the closest places and names.

**Kāpae'oa** (or Kapae'oa) refers to an early nineteenth century ahupua'a that included the current Project area (one of five that make up what is now known as Kawailoa Ahupua'a) (e.g., Kanehui'uma Schools 1987) and/or the coastal area from Waimāna Bay back towards Waialua (e.g., Sahlins 1992) (see Figure 8). It is not defined in any common place-name sources. Perhaps the most widely-known mo'olelo associated with Kāpae'oa is that of the fish god Kāne'akai, who amously washed ashore as a drifting log at Kēhohāpu'u. It is tempting to suggest this may be one of the primary meanings of this place name (i.e., kā-pae'oa, the-drifted-ashore-place-of-importance).

**Kēhohāpu'u** and the nearly identical Ke'ahuohāpu'u refer to the natural rocky point and to a famous fishing shrine located upon this point dedicated to Kāne'akai. Based on evidence gathered during a recent TCP study of nearby Waimāna Valley (Monahan 2009), there is reason to believe the rocky point is properly called Kēhohāpu'u (without an “a” after the article “Ke”), while the shrine itself is K-e-ahu-o-hāpu'u (i.e., the-altar-of-the-hāpu'u [fish]). The hāpu'u is a kind of grouper fish.

**Wānanapa'a** is the group of small islets (sometimes described as one or two islets, but there are actually several) immediately adjacent to Kēhohāpu'u, just north of the Project area. According to Pukui et al. (1974), Wānanapa'a literally translates as “unsuccessful prophecy” (wāna'a meaning “prophecy” and pāoa meaning “unsuccessful”). Pukui et al. (1974) do not elaborate on this translation, but it seems clear this name is connected to the nearby Kupopolo Heiau—directly along the ahupua'a's boundary line from Wānanapa'a—and the last O'ahu-born Kahuna Nui, Ka'opulupulu. In short, and this is described in more detail below (see Section 3.3.4), Kupopolo was said to have been built as a place for the priests to receive visions (i.e., extrasensory perception or 'ike pāpōkū); however, the heiau (temple) did not live up to its expectations and many of which have been lost, forgotten and/or kept secret through time. Place names may also convey kaua (hidden meaning(s)) and/or huna (secret) information that may even have political or subversive undertones.

**Kawailoa**, literally “the long water,” may be a reference to the fact that Kawailoa Guleh, which turns into Amāhuku Stream in its lower reaches near the coast, is the longest continuous stream drainage on O'ahu, stretching high into the leeward side of the Koʻolau Mountains. **Kamananui**, the land to which the maka'āpua (commoners) of Kāpae'oa were attached prior to the Māhele, translates literally as “the supreme or highest spiritual power” (ka-mana-nui). Interestingly, there are other wahi pana on O'ahu named Kamananui including the main stream at nearby Waimāna Valley (especially above the falls) and a valley in Moanalua Ahupua'a, Kona Moku.

The **moku** of Waialua, within which the Project is situated, is not translated by Pukui et al. (1974); however, a literal translation is “two” (lua) “water[s]” (wai), which may be a reference to the pair of major streams that empty into its two main bays (Waialua and Kaiaha). Sterling and Summers (1978:88) compiled other alternative interpretations of the origins of the meaning of Waialua including references to a particular lo'i (irrigated taro patch), a specific pānāwai at a place called Kemo'o, and a cruel ancient chief named Waia (see below).

![Figure 8. Waialua (Sahlins 1992:19)](image-url)
Cultural Impact Assessment for the Kekaha Kauai Cultural Learning Project.

3.3.3.1 Waialua Moku

The significance of the moku of Waialua in the consciousness of native Hawaiians—and in particular, those of the families native of O‘ahu—is suggested by the numerous traditions associated with it. For example, Samuel Kamakau, the pioneering nineteenth-century historian who was born in Waialua, identifies this moku as the site of a significant event in the consolidation of chiefly power in the islands.

Waialua, with its fine harbor, was the site of a large settlement in ancient times. It was established as chiefed-ruled kingdom. From Waialua, Oahu, and from there, the group of Hawaiian Islands became known as Waialua. The first chief to be set up as a ruling chief was Waia, grandson of Wakea. He carved nothing of the gods or doing of his own. He was the first man in the Hawaiian Islands to be established as a chiefed-ruler (Kamakau 1964-65).

For the 28 generations from Hulihonua, the first man in the ancient Hawaiian Islands, to Wakea, the first chief, there were no chiefed-rulers. Waia was the first to be established as a chiefed-ruler. From Wakea to Waia, no man was made chief over another. During the 25 generations from Waia to Wakea, various noted deeds are mentioned in the traditions and histories. These deeds indicate a close relationship between Pele and Hiiaka, A Myth from Hawaii (Kawaharada 1996). The place was named for him Waia-lua (Doubly disgraceful) (Pukui synopsis of Hawaiian legends). The significance of the moku of Waialua in the consciousness of native Hawaiians—and in particular, those of the families native of O‘ahu—is suggested by the numerous traditions associated with it. For example, Samuel Kamakau, the pioneering nineteenth-century historian who was born in Waialua, identifies this moku as the site of a significant event in the consolidation of chiefly power in the islands.

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The lily tufts of Ihu-koko
Are gnawed away by the water
And thrashed about by the wind.
Beat down by the rain from heaven,
The wave-ribs are flattened out.
Hushed be the voice—merely the voice.

From the same vantage-ground—that of Kehu-o-hapu'u—
Hiiaka not only saw the dash of the ocean against the buttresses of the near-coast,
her ears also were filled with a murmurous ocean-roar that gave to the air a tremor like that of a deep organ-tone:

O Wai-alua, kai leo nui:
Ua lono ka uka o Lihu'e;
Ke wa la Wahi-awá, e.
Kuli wale, kuli wale i ka leo;
He leo no ke kai, e.
Wai-alua, land of the surrounding sea,
With audience in upland Lihu'e—
A voice that reaches Wahi-awá:
Our ears are stunned by this voice—
The voice, I say, of Old Ocean!

The landscape still held her, and she continued:
O Wai-alua, la'i ehá, e!
Ehá ka malino lalo o Wai-alua.
Wai-alua has a fourfold calm,
That enfolds and broods o'er the land.
(Emerson 1915:98–99)

What is this plant?
Strands of blue,
Coloring of the deep sea.
An 'uki'uki plant with the dark fruit
(Kaeoka and Weissich 2003:146)

One of the most enduring and touching tributes to Kāne'aui is a pamphlet by Weberg (1983) entitled "ne'aukai, A Legend of Waimea Bay," which looked as if only yesterday
and is an obvious labor of love by one who recorded a local version of a well-known legend.
The foreword explains the genealogical connections of the native (women) who conveyed the story to him:

The two sisters who told this story to me belong to a family which was friendly
from the Kehu-o-hapu'u. The sisters, whose information by McAllister in Sites of Oahu, Book III, Vol. 2, told me the story of the Kehu-o-hapu'u, state that they were the daughters of the
same Mr. Hookala and that this story was one of the many legends narrated to the narrator by
his mother, Huluka, over a period of years.

The aforementioned is but a small sample of mo'olelo related to Kāne'aui and the Kehu-o-hapu'u. For example, a story of 1953 when a man hand-across the bay from the shrine.

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Cultural Surveys Hawai‘i Job Code: KAWAILOA 5

Traditional Background

Cultural Impact Assessment for

3.3.4 Kupopolo and Pu‘u o Mahuka Heiau

Pu‘u o Mahuka overlooking Waimea Bay at Pāpūkea is closely associated with the last local-born Kahuna Nui of O‘ahu, Ka‘opulupulu, and with Kupopolo Heiau located just mauka of the current Project area. Ka‘opulupulu is famous for his ‘ike pāpāhu (clairvoyance), including his prophesies that O‘ahu would be conquered from the windward seas. Ka‘opulupulu reportedly ordered Pu‘u o Makuha Heiau (see Figure 10) to be built after Kupopolo failed to serve its primary purpose of serving as a place where Ka‘opulupulu could have visions. Kennedy describes it as follows:

During the reign of Kahahana, who became ruler of Oahu in 1773, Waimea’s presiding priest was Kaopulupulu. Many legends and stories recount the life of this famous prophet.

In one legend, Kahahana asked his priest to determine whether the gods approved of him, and whether the island of Kauai would surrender if he invaded its shores. Kaopulupulu requested that a temple be built where he could “speak to the great chief Kekaulike of Kauai through the thoughts of the great akua Mahuka.”

At first, Heiau Kupopolo was built on the beach of Waimea Bay; however, when Kaopulupulu used it, he received no answer from Kauai. It was thought the temple was in the wrong location. Because the kahuna believed that “thoughts are little gods, or kupua, that travel in space, above the earth…they fly freely as soaring birds,” he called on the people to build a second temple high upon the cliffs. This was to become Heiau Pu‘u o Mahuka. From the temple, Kaopulupulu sent out thought waves, and the answer quickly returned—Kauai wished for peace. (Kennedy 2006:14)

Many local people speak with reverence of Kēhuohapu‘a, a rocky point in the center of the image, viewed from Pu‘u o Mahuka looking southwest across Waimea Bay (Monahan 2009).

3.3.5 Wānapanapaoa

Many local people speak with reverence about the small islets known as Wānapanapaoa just offshore at Kēhuohapu‘a. In a TCP study of Waimea, well-known Wai‘anae-based historian Glen Kila (currently Principal at Kamaile Elementary) spoke about “Waimea’s giant rocks of shoreline, like Kula‘ila‘i rock off Māku‘a Beach [in Wai‘anae], [as] symbols of Papa’s or Haumea’s embryos” (Monahan 2009). The name Wānapanapaoa, literally “unsuccessful prophecy,” appears to be connected with Ka‘opulupulu’s difficulties in obtaining visions at Kupopolo, as described above.
3.5 Heiau and Other Religious Sites

The Project area is uniquely located in proximity to two highly significant religious sites: the Kupopolo Heiau and the other major wet-taro cultivation and settlement centers. Waialua Bay, and includes the extensive wetlands and fishponds at 'Uko'a and Lokoea.

Waimea, on its second-order slopes, was an area rich in wet-taro with water as any other site major wet-taro cultivation and settlement centers. The Project area is located between two major wet-taro cultivation and settlement centers. The Project area is uniquely located in proximity to two highly significant religious sites: the Kupopolo Heiau and the other major wet-taro cultivation and settlement centers. Waialua Bay, and includes the extensive wetlands and fishponds at 'Uko'a and Lokoea.

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Figure 11. 1905 visit by Hawaii Historical Society to Kupopolo Heiau, Kawaiola (Waimea Falls Park Archives, a copy of Hawaii State Archives image)

Figure 12. Kupopolo Heiau (Jan Becket September 2010)

3.5.2 Keahuohapu‘u

As summarized above (see 3.3.3), this shrine, variously described in the literature as either a ko‘a or a kū‘ula, is associated with a vast amount of mo‘olelo dealing with the fish (or shark) god Kāne‘aukai, and with two local fishermen sometimes referred to as kahuna. From the photograph (see Figure 13), it appears the term kū‘ula is most appropriate given the apparent lack of coral, of which ko‘a are characteristically comprised. In addition to the many fish-god legends, other interesting oral-historical accounts are also linked to this shrine. These add to its heightened cultural value. For example, a Hawaiian-language (Ke Aho Aina) newspaper from 1911, printed the following love story using a popular style in vogue at the time:

Ahu-o-Hapuu, Kahelekulani and Waikumailani

(Synopsis) Kahelekulani, foster [sic] daughter of Haumea, was reared on [Hilaniwai, Kāne‘ohe], Oahu. Waikumailani, foster son of the lizard goddess Kalamainuu, was raised in a cave on Mauna Kea. The two dreamt of each other and fell in love. A man was sent from Oahu to fetch him and the two became man and wife. On their wedding day, her father prophesied [sic] that he would one day want to go on a circuit of Oahu, and when he did, he would fall in love with Hawaii, a maiden of Waialua, Oahu...[after his inevitable fall from grace and after having left his wife for the maiden of Waialua] ... [he,
4.1 Early Historic Period

The place became known as Kahakulake Kauai. As the odor came to the sand on the other side they became known as Kapa Kauai. (McAllister 1933:141-142.)

Samuel Kamakau records that Kauai was also burned in the fire of Haua, one of the Kaahilis. The man who had been burned was the Oahu chief and was living in the Kauaia village. His body was left to decompose on a lodge where the Ku people were at the Kea Point Three miles to the southwest of the present Project area.

In 1794, Kamehameha erected the “king’s seat of Waianae and Uniao.” In the year, 1794, Kealoha had been killed and his forces were defeated. Kamehameha proceeded to the Battle of Nuuanu in April 1795. Apparently the Waialua District was spared direct involvement in the battles of Nuuanu and Wai'anae. (Kamehameha 1902:18).

According to the story of Kamehameha’s conquest, Kamehameha’s forces conquered Waialua District, and the Waialua District was spared direct involvement in the battles of Nuuanu and Wai’anae. (Kamehameha 1902:18.)

3.5.3 Kaahakii—A Sacred Puhulu

McAllister (1933) described a sacred stone known as “Kaahakii,” a “tongue-shaped stones, with only the tip protruding above the ground,” into the 1930s, it could still be seen and visited on the Makaha Road, a few miles to the southwest of the present Project area:

The place became known as Kahakulake Kauai. As the odor came to the sand on the other side they became known as Kapa Kauai. (McAllister 1933:141-142.)

Samuel Kamakau records that Kauai was also burned in the fire of Haua, one of the Kaahilis. The man who had been burned was the Oahu chief and was living in the Kauai village. His body was left to decompose on a lodge where the Ku people were at the Kea Point Three miles to the southwest of the present Project area.

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According to the story of Kamehameha’s conquest, Kamehameha’s forces conquered Waialua District, and the Waialua District was spared direct involvement in the battles of Nuuanu and Wai’anae. (Kamehameha 1902:18.)

3.6 Trails

Although he does not present much detail, John Papa Fapina, briefly describes the old coastal trail that passed very near to the current Project area:

This trail is depicted, albeit at a general resolution given the scale of the map, as passing through the current Project area. (M. T. W.)
After the Sabbath we examined and encouraged, and partly supplied with books, the adjacent school established there under the particular patronage of Lydia Kamakau and Gideon Lamou, to whom we had been collecting donations for more than a year. The innovations were received with the usual alacrity that they are so often met with; and the pupils made rapid progress, and the general improvement of mind and taste of the people was not to be mistaken. 

During the same decades that commercial enterprises were forcing changes upon the Hawaiian islands, western missionary interests were establishing their foothold there. The American Board of Commissioners for Foreign Missions, headquartered in Boston, sent its first company of missionaries to the Hawaiian Islands in 1819, leaving Boston on October 23rd. 

During the same period, the trade in sandalwood, the strict monopoly of the kingdom, was beginning to decline. 

Trade in sandalwood was the last monopoly of the ali'i (chiefs) beginning with Kamehameha I. During the 18th century, the sandalwood trade was becoming less important to the Hawaiian economy. 

Next day we sailed for Whymea bay, on the west end of the island, to get another cargo of wood. 

Although La'au was living at Kawailoa in 1832 (Namahana had died in 1829) when the Rev. John S. Emerson arrived at Waialua in 1819, twotrim, our chief, had gone to the meeting with my father, they found an immense crowd of natives filling every part of the house and others crowding around all the windows and doors, utterly unable to enter. 'Truly the Spirit of God is here working on the hearts of this people, who are hungering for instruction,' thought my father. Dr. Judd, who had been in the country four years longer than he, began to ask questions, and found that La'au had issued positive commands that everyone in the entire district of Kawailoa should cleanse himself and come to the house of the first Protestant church in Waialua (Sahlins 1992:95-96). 

After Kamehameha's death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the trade, resulting in an unrestricted demand on the stocks of the wood and upon the energies of the men who did the harvesting. Already in October 1817, it was paid for Whymea...where we took on board a full cargo of wood in thirty-six hours - more than 200 courses employed in bringing it off, day and night. (Corney 1828:55) 

After the Sabbath we examined and encouraged, and partly supplied with books, the adjacent school established there under the particular patronage of Lydia Kamakau and Gideon Lamou, to whom we had been collecting donations for more than a year. The innovations were received with the usual alacrity that they are so often met with; and the pupils made rapid progress, and the general improvement of mind and taste of the people was not to be mistaken. 

Although La'au was living at Kawailoa in 1832 (Namahana had died in 1829) when the Rev. John S. Emerson arrived at Waialua in 1819, two-year-old his wife arrived at Waialua Bay to establish a mission station in the area in 1825.
Waialua should attend this service under threat of severe penalty...When Laanui had filled the meeting-house with the crowd of people standing, he ordered them to sit down on the floor packed together as close as possible, but a great many were still compelled to stand outside. After the services were over, Dr. Judd and my father kindly explained to Laanui that he should not force his people to attend church in that way. (Emerson 1928:88–89)

It is possible to estimate the population comprising everyone in the entire district of Waialua in 1833. Census data gathered by Protestant missionaries throughout the Hawaiian Islands beginning in 1831 provide the earliest documentation of the size of the native population after the first decades of western contact. During the first census of O‘ahu Island in 1831–1832, a total population of 2,640 was recorded in the Waialua District, comprising only 8.8% of the entire island population of 29,745 (Schmitt 1977:12). By the census of 1835–1836, the Waialua population had dropped to 2,415, comprising 8.6% of the O‘ahu Island population of 27,798 (Schmitt 1977:38). Sahlins (1992:144) reports that, in 1839, there were 855 people counted in Kawaiola Ahupua‘a, including the current Project area of Kapaeloa.

By the time Protestant missionaries were establishing their presence in Waialua in the 1830s, the sandalwood trade that had driven commerce in the Hawaiian Islands had collapsed. However, new enterprises were emerging to fill the void and activity at Waialua would continue apace. In October of 1819, two whaling ships had anchored in the Hawaiian Islands. During the next decades, other whaling ships would follow, as the islands became a whaling and layover base in the mid-Pacific. Supplies of beef, fresh and salted, and produce were in demand; and a trade in hide and tallow was also developing. As had happened during the years of the sandalwood trade, authority to commandeer valued goods from the commoners of Waialua was vested in the chiefs:

The variety, as well as amount of things being appropriated from Waialua by the ruling chiefs is impressive. The Aloha Gidiona [Gideon La‘ana‘u] letters speak of ocean fish taken in sweeps as well as great quantities of fish shipped from the old royal ponds of ‘I‘uka‘a and Loko‘ena, of dry cooked taro (putai) as well as poi [pounded taro], of sweet potato, breadfruit, shrimp, goats and pigs, timbers of different kinds, chickens, oranges and lemons—and often, of cash money. (Sahlins 1992:145)

Figure 14. Hiram Bingham preaching at Waimea in 1826 along with Ka‘ahumanu and Hewahewa (B.P. Bishop Museum Archives)

4.2 Mid-Nineteenth Century and the Māhele

Towards the mid-nineteenth century, the Organic Acts of 1845 and 1846 initiated the process of the Māhele—the division of Hawaiian lands—which divided the lands for private property ownership to all Hawaiians. In 1848, the crown, the Hawaiian government, and the ali‘i received their land titles. The majority of Waialua was awarded to Victoria Kamīnalu, sister of Alexander Liholiho (King Kamehameha IV) and Lot Kamemamohu (King Kamehameha V). As was common, nearly the entire ahupua‘a of Kawaiola was awarded to Kamīnalu (Land Commission Award 7713 ‘Ilima [Lot 33]).

The maka‘āinana received their kuleana (Native land rights) awards (individual land parcels) in 1850 and thereafter. Although many Hawaiians did not submit or follow through on claims for their lands, the distribution of LCAs can provide insight into patterns of residence and agriculture. Many of these patterns probably had existed for centuries past. By examining the patterns of kuleana LCA parcels in the vicinity of the Project area, insight can be gained to the likely intensity and nature of Hawaiian activity in the area.

Four LCAs (8345, 10246, 10772, and 10971) have been identified in the vicinity of the Project area (Figure 15). Documentation from the LCAs was reviewed in an attempt to reconstruct Hawaiian land use patterns in the vicinity of the Project area during the mid-nineteenth century (Table 1; Appendix D). Though the testimonies recorded by the claimants and...
their witnesses are sometimes ambiguous, the kuleana data indicates a settlement pattern where households had multiple 'apana in different geographical locations, with the immediately coastal 'apana being utilized for fishing and habitation and manka 'apana being used as kulea to cultivate sweet potatoes. Additionally, pali were being exploited for the collection of wauke (paper mulberry) and hala (pandanus). Thus, the LCA documentation indicates a wide range of indigenous Hawaiian subsistence activities being practiced in the vicinity of the Project area.

Coulter's (1935) demographic data of O'ahu for 1853, right at the time of the Māhele, do not depict any symbols indicating a resident population in or immediately near the Project area (Figure 16). Given the way Coulter's data are presented, however, it is unclear if he discounted places with less 50 residents on O'ahu (each of his small circular symbols represents 50 people, and he does not use any smaller symbols). At the nearby Waimāna Valley, Coulter's data showing a total of approximately 50 residents in 1853 has been demonstrated to be a substantial underestimate. Monahan's (2009) data analysis of Land Commission documents and other records (e.g. missionary lists of church members' place of residence compiled by Anne Takemoto for the Bishop Museum) for Waimāna showed more than 100 families (not individuals) lived there in the middle 1850s, suggestive of several hundred resident individuals. Thus, it would appear Coulter's absence of a population symbol at the Project area should not be interpreted literally. Given all available information, it seems likely the Project area and its immediate environs would have been home to several dozens of individuals in early historic times.

Figure 15. Locations of Land Commission Awards (LCAs) in the vicinity of the Project area (USGS 1999)
Historical Background

### 4.3 1850s to 1900

The whaling industry in the Pacific Ocean reached its peak in 1859; however, prices for whale oil collapsed five years later when oil (petroleum) was discovered in Pennsylvania. Since the 1840s, the Hawaiian economy had been dependent primarily on supplying whaling ships during their long layovers in the islands. With the dwindling number of arriving ships during the 1860s, many residents of districts like Wai'akua migrated to Honolulu and other parts of O'ahu.

Government census data collected during the second half of the nineteenth century document the diminishing population of the Wai'alua District and, presumably, Kāʻpae'a Ahupuaʻa. In 1853 a total of 1,126 persons were recorded in Wai'alua. Nineteen years later, in 1872, the total district population had dropped to 851 (Schmitt 1977:12–13).

During the second half of the nineteenth century, following the death of Victoria Kamāmalu in 1866, Kāʻpae'a Ahupuaʻa was passed on to successive members of the ali`i:

Kāmāmalu's] entire estate was inherited by her father, Kekūkau‘ō. He died two years later and the estate went to Kekūkau‘ō's son Lota Kapūlī, who by that time reigned as Kamahameha V... Kapūlī, who died intestate in 1872, whereupon Ruta Keʻelikōlani, Kapūlī's half-sister, petitioned for and received in 1873 the entire estate... By 1883, Ruta Keʻelikōlani died, leaving all of her estate to her cousin Bernice Pauahi Bishop. (Kameʻekīhiwa 1992:309–310)

The B.P. Bishop Estate Trust presently retains ownership of most of the ahupuaʻa of Kāwaiola.

The diaries of Robert C. Perkins, an entomologist and ornithologist, who collected specimens at Kāwaiola in 1892-1893, reveal aspects of life in the ahupuaʻa near the end of the nineteenth century:

The end of 1892 and early months of 1893 were not very favorable for collecting, the weather being generally wet in the mountains and there were big spates of the mountain streams, these did very much damage to the system of溜es belonging to the Chinese of the district on more than one occasion during the winter months. (Perkins 1892-1893)

The "Chinese of the district" Perkins mentions were the rice growers who had settled after fulfilling their contracts with the sugar plantations that had brought them to the Hawaiian Islands (the first Chinese contract laborers arrived in 1852). The islands were well positioned for rice cultivation. A market for rice in California had developed as increasing numbers of Chinese laborers immigrated there since the mid-nineteenth century. Similarly, as Chinese immigration to the islands also accelerated, a domestic market opened:

By 1876 there was still a considerable amount of former taro land available for rice farming. The great demand for rice land brought disused taro patches into requisition - especially because water rights attached to them...

---

**Table 1. Land Commission Awards Located in the vicinity of the Project Area**

<table>
<thead>
<tr>
<th>Land Claim</th>
<th>Claimant</th>
<th>'Ili</th>
<th>Land Use</th>
<th>Landscape Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>8345</td>
<td>Kaakaukua (also written Kekaukua)</td>
<td>Kapaeloa (other 'ili named are Ulumalua, Pahoa, Hau)</td>
<td>Sweet potato cultivation, fishing (squid fishery)</td>
<td>Sea/shore/dunes, pali, road/path</td>
</tr>
<tr>
<td>10246</td>
<td>Maloiki</td>
<td>Kapaeloa</td>
<td>House lot, sweet potato cultivation</td>
<td>Wall/fence, pali</td>
</tr>
<tr>
<td>10772</td>
<td>Pelapela</td>
<td>Kapaeloa</td>
<td>waneke, hala cultivation/gathering</td>
<td>Stream, road/path, pali</td>
</tr>
<tr>
<td>10971</td>
<td>Wahinehune</td>
<td>Kapaeloa</td>
<td>House lot, 2 b', sweet potato cultivation</td>
<td>Stream, wall/fence, road/path, pali</td>
</tr>
</tbody>
</table>

1. According to Sahlins (1992:218), there is another claim number 8345 by Kaakaukua.
2. Although three 'apana were awarded for 10246, only two are specifically claimed or described in Land Commission documents.
3. According to Sahlins (1992:219), there is another claim number 10772 by Pimaau.

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**Figure 16. Coulter’s 1853 population density map for Oʻahu; each small circle represents 50 people (Coulter 1985)**
As the demand for rice continued, it became profitable to bring into use land hitherto unused. The land most easily rendered fit for rice cultivation was swamp or marsh land of which there was a large amount in the islands. At Waialua on Oahu, about three hundred acres of swamp land were reclaimed for rice farming (Couler and Chun 1937:11).

In 1892, there were 180 acres under cultivation of rice in the Waialua District; these rice fields were located in the ahupua’a of Mokule’i, Kamananui and Kawailoa (Couler and Chun 1937:12, 21). The immigrant Chinese may account for the rise in the Waialua District population during the last quarter of the nineteenth century; Government censuses record populations of 939 in 1878, 1,265 in 1884, and 1,286 in 1890 (Schmitt 1977:13). Rice cultivation would have no direct impact within the Project area, which would never have been suitable for such rice agriculture.

Robert Perkins’ diaries also reveal that Kawailoa and Waiahu had become a favorite haunt of hunters:

At this time Waialua was much visited by sportsmen of Honolulu, as great numbers of golden plovers were scattered over the forehills and along the coast. The native wild duck was common on the ponds and there were a good many pheasants amongst the lantana on the plains, but still more on the dry forehills below the forest and within this, before the trees became continuous or dense. At intervals during the day the plover habitually resorted to the ponds near the coast, usually in small flocks at a time, and were shot from blinds...Some of the men that I met at Waialua were very fine shots and on their weekend visits made large bags of duck and plover. In the mountains there were a few wild chicken and here and there some wild turkeys...

Thick forests, no doubt, once came down at least to 700 feet, for there were many traces of fires, some very old and some comparatively recent. Great herds of wild pigs may sometimes be seen crossing the flats between the gulches, where they chiefly hide. I counted 42 in one lot, of different sizes, from the largest boar with great tusks to pigs only half grown. High up in the dense forest I occasionally came on a solitary old boar in the soft fern. These do not run away when one comes on them suddenly, but, if one is only a few yards distant and stands still, they will walk very slowly away, looking back at one... (Perkins 1892-93)

By the 1890s, hunters and other visitors to Waialua could have reached there by train from Honolulu. The Oahu Railway and Land (OR&L) Company, organized by Benjamin Dillingham in 1889, connected outlying areas of O‘ahu to Honolulu (Figure 17). During the last decade of the nineteenth century, the railroad would reach from Honolulu to Pearl City in 1890, to Waianae in 1895, to Waialua in 1898, and to Kahuku in 1899 (Kuykendall 1967:100). In 1899, Dillingham, pursuing new business for his railroad, persuaded Castle & Cooke to lease Waialua land already under cultivation of sugar. In 1898, Castle & Cooke organized the Waialua Agricultural Company and soon began a program of land purchases and leases to increase the plantation’s capacity. In relation to the current Project area, however, the development of the railroad probably had the most direct cultural impact. A 1929 USGS topographic map indicates that the OR&L railroad ran through the northern half of the Project area (Figure 18). The 1929 map also indicates the presence of Kupopolo Heiau (spelled “Kupopolo” on the map) approximately 130 meters east of the Project area.
4.4 1900 to 1950s

Waialua Agricultural Company, later named Waiaha Sugar Company, continued to expand during the first decades of the twentieth century, eventually reaching more than 12,000 acres, including a large portion of Kīpāeaua, which was leased from the Bishop Estate.

The expansion of the sugar plantation is reflected in government censuses of the early 1900s. While in 1896 there were only 1,349 persons recorded in Waialua District, subsequent censuses recorded 3,285 persons in 1900, 6,083 in 1910, 7,641 in 1920, and 8,129 in 1930 (Schmitt 1977:13–14).

Following the Japanese attack and the United States’ entrance into World War II, December 7th, 1941, Hale‘iwa and the surrounding area was subjected to major infrastructure improvements associated with military activity. Military records indicate the construction of bunkers, housing and storage buildings, as well as improvements to the Hale‘iwa Auxiliary Field facilities (Borthwick et al. 1998). These improvements in turn created the demand for labor, services, and associated constructions, which led to a further increase in population.

A 1943 War Department Map (Figure 19) indicates that the Project area was still undeveloped, with the exception of a segment of railroad line present within the northern portion of the Project.

The war in the Pacific had been over less than a year when the Hawaiian Islands were devastated by a tsunami (tidal wave) that left at least 150 people dead and caused more than $25 million in property damage. On April 1, 1946, an earthquake off the Aleutian Islands at about 2:00 a.m. (Hawaiian time) generated the tsunami that reached the islands about four hours later.

The severity of the tidal waves varied at different locales. At Waialua Bay, the waves ranged from 10 to 11 feet above sea level; further along the coast between Waialua and Waimea bays, wave heights of 19 and 17 feet above sea level were recorded (Shepard et al. 1950:418, 421).

The OR&L Company ceased operating its rail line in 1947. The Hale‘iwa Hotel, which the U.S. Army had used as a recreation facility during the war, closed in 1952.

A 1954 U.S. Army Service map indicates a few structures within the Project area. These structures probably correspond to the residential homes that are currently present within the Project area (Figure 20). Also of note is that “Kupupolo Heiau” is still indicated as being present in the area.

A 1978 aerial photograph shows extensive sugarcane cultivation on mauka tablelands located approximately 250 meters southeast of the Project area (Figure 21).
Figure 19. 1943 War Department Map showing Project area location

Figure 20. 1954 Army Service map showing the location of the Project area
Section 5  Previous Archaeological Research

5.1 Overview

The main objectives of this section are (1) to establish a pre-Contact and early historic-era context for traditional land use and resource management in the Project area by providing an overview of relevant archaeological research, and (2) to provide a detailed discussion of archaeological evidence within and immediately adjacent to the Project area (Figure 22, Table 2). This is not an exhaustive review of all previous archaeological research in Kawailoa Ahupua‘a, which is beyond the scope and purpose of this report. Rather, the main focus of this section is on reviewing previously-identified archaeological resources that are within or near the current Project area.

This overview confirms the Project area was part of a fishing village, or a scattering of small fishing villages, known in historic times as the ili of Kapaele. Several significant archaeological sites have been documented immediately adjacent to the Project area to the north and east including marker stones and religious shrines dedicated to fishing (or shark) gods, the extensive Kupolopo Heiau, and surface and subsurface evidence of maka‘a‘ina habitation/settlement sites dating from at least the mid-fifteenth century (based on dates obtained by Athens and Shun 1982 from excavated archaeological materials) and probably earlier.

Based on all available archaeological evidence, it is likely that significant archaeological deposits are located in some portions of the Project area in subsurface contexts. In part, this is due to the fact that commercial sugarcane activities did not extend into the Project area; that the Project area has not been extensively developed; and that construction of the Kamehameha Highway generally spared the Project area.
5.2 Early Archaeological Research

McAllister’s (1933) classic island-wide survey for the Bishop Museum, the first of its kind on O‘ahu, is significant from a historical perspective because it represented an early attempt to systematically record cultural resources in places where little or no prior scientific work had been conducted; at the same time, however, it is clear that McAllister’s findings were skewed towards large, easily-accessible sites, such as prominent heiau built by high chiefs (e.g. Kupopolo Heiau), and sites located at or near the coast. His results do not constitute a representative sample of archaeological resources in any given area, but they do provide some understanding of many of the best-known cultural resources (at the time in the 1930s), including wahi pana and associated mo‘oolelo that were important to Native Hawaiians.

McAllister identified four sites in the immediate vicinity of the Project area: Site 241 (Kupopolo Heiau), Site 242 (rockshelter), Site 243 (Sacred stone), and Site 244 (Fishing shrine).
This rockshelter is located approximately 130 meters east of the present Project area.

This sacred stone was located approximately 130 meters east of the present Project area.
5.3 Modern Archaeological Studies

5.3.1 Cluff 1968

In 1968, the University of Hawai‘i (Cluff 1968) conducted an archaeological surface survey of Kupopolo Heiau and an adjacent area immediately east of the current Project area. Kupopolo Heiau was identified and documented as well as two petroglyph concentrations, a stone enclosure which may contain an akua stone, and historic artifacts (glass bottles).

5.3.2 Welch 1981, Athens and Shun 1982

In 1981, the Bishop Museum conducted an archaeological reconnaissance survey of two parcels on the south side of Waimāna Bay, located along the northeastern border of the current Project area (Welch 1981). Ten historic properties were identified: a small heiau, a water hole, enclosures, two stone walls, rockshelters, a midden scatter, a midden deposit, stone platforms, and a railroad bed.

In 1982, the Bishop Museum conducted archaeological test excavations and mapping of a portion of the area originally surveyed by Welch in 1981 (Athens and Shun 1982). Fieldwork consisted of subsurface testing at two midden sites (State Inventory of Historic Properties [SIHP] No. 50-80-01-2483 and -2484), and mapping of various surface sites. Testing revealed extensive fish bone and marine shell midden as well as the presence of numerous indigenous Hawaiian artifacts including fishhooks, coral and sea urchin spine files, volcanic glass flakes, basalt adzes, and an ‘ulu maika. Hydration rind analysis of collected volcanic glass samples at SIHP -2483 yielded an estimated occupation of the site to the mid-fifteenth century. Although this dating technique has been largely discredited in recent years, it is highly likely that some of the archaeological materials at this location are at least several centuries old.

A site location map generated by the Bishop Museum places three historic properties within the current Project area: SIHP -2483, a concrete foundation and stone wall within an associated midden deposit containing indigenous Hawaiian artifacts; SIHP -2487, a complex of stone and earthen platforms possibly of post-Contact origin; and SIHP -2489, a segment of OR&L railroad berm (Figure 24).

5.3.3 Bath 1988

Joyce Bath (then) of the SHPD (1988) reported findings of human remains (SIHP -3724) at TMK (1) 6-1-011:020 on the inland side of Kamehameha Highway approximately 400 meters southwest of the present Project area. This stretch of coast tends to be rocky and lacking in Jaucas sand deposits as is the coast in the immediate vicinity of the Project area. It is unclear at this time whether this burial find was truly anomalous or whether burial in terrigenous soils was a pattern where Jaucas sand beach deposits were not available.

5.3.4 Masterson et al. 1995

In 1995, CSH conducted an archaeological reconnaissance survey of an approximately three-acre parcel at Kawailoa Beach, located approximately 1200 meters southwest of the current Project area (Masterson et al. 1995). The reconnaissance survey identified stacked basalt boulder
walls, a historic bridge constructed of basalt and mortar, and a segment of the OR&L right-of-way (SIHP-9714). Of note are stacked basalt walls, as they were identified by Rudy Mitchell (then) of Waimanu Falls Park, who believed they may have been remnants of Puiupea Heiau (per comm. Rudy Mitchell 1995 in Masterson et al. 1995). However, Puiupea Heiau was reported by McAllister as being located at Punamue Point, some 500 feet makai and west of the identified walls (McAllister 1933, cited in Masterson et al. 1995). Thus, it was determined that the observed walls were not associated with Puiupea Heiau.

5.3.5 Hammatt and Shideler 2006
In 2006, CSH conducted an archaeological literature review and field inspection of an approximately seven-acre area located immediately east of the current Project area (Hammatt and Shideler 2006). During the field inspection, walls and terraces of traditional Hawaiian construction were identified.
5.4 Archaeological Inventory Survey

CSH conducted an AIS for the Project area (Tulchin and Hammatt 2011). The survey identified three historic properties within the Project area: a portion of the OR&L railroad berm (SIHP No. 50-80-01-2489) and two post-Contact habitation sites (SIHP No. 50-80-01-7144 and -7145). The railroad berm is a discontinuous segment of the OR&L railroad originally documented by the Bishop Museum immediately to the northeast of the Project area (Athens and Shun 1982; Welsh 1981; see Section 5.3.2). The two habitation sites are likely the remnants of a mid-twentieth century historic houses. SHIP No. 50-80-01-7144 contains a terrace, wall, alignment, and remnants of a wastewater treatment system, and SHIP No. 50-80-01-7145 contains a terrace, a dirt road, and a clearing containing modest stone alignments and concrete foundations. CSH determined that the integrity of location of all three historic properties makes them eligible to the Hawai‘i Register of Historic Places under Criterion D for the information they have yielded, or are likely to yield. CSH concluded that it is very likely that subsurface historic properties, associated with both pre- and post-Contact land use, are present within the survey area in the form of cultural layers and/or structural remnants buried by modern and/or historic fill layers.

5.5 Summary of Archaeological Research

As stated in the overview to this section, based on all available archaeological evidence, it is likely that significant archaeological deposits are located in some portions of the Project area in subsurface contexts. In part, this is due to the fact that commercial sugarcane activities did not extend into the Project area; that the Project area has not been extensively developed; and that construction of the Kamehameha Highway generally spared the Project area.

Historic research documents four LCAs (8345, 10246, 10772, and 10971) immediately adjacent to the Project area on the mauka side of Kamehameha Highway, suggesting indigenous Hawaiian land use in the form of habitation and agriculture. Historic research has also indicated the presence of the OR&L railroad within the northern portion of the Project area.

Previous archaeological investigations have identified numerous pre-Contact sites and features in the vicinity of the Project area including heiau, fishing shrines, sacred stones, stone walls, enclosures, and platforms. Previous archaeological investigations have also identified post-Contact historic properties in the vicinity of the Project area primarily associated with the OR&L railroad infrastructure (bridges, railroad beds, etc.).

Of note is a 1982 Bishop Museum study (Athens and Shun 1982) conducted immediately northeast of the Project area, but also extending into the current Project boundary (see Figure 24). This study identified three historic properties within the current Project area: SHIP -2483, a concrete foundation and stone wall within an associated midden deposit containing indigenous Hawaiian artifacts; SHIP -2487, a complex of stone and earthen platforms possibly of post-Contact origin; and SHIP -2489, a segment of OR&L railroad berm. Subsurface testing at SHIP -2483 revealed extensive fish bone and marine shell midden as well as the presence of numerous indigenous Hawaiian artifacts including fishhooks, coral and sea urchin spine files, volcanic glass flakes, basalt adzes, and an ‘ulu maika. These finds are clearly pre-Contact in age and likely date from several centuries ago.

The accompanying AIS conducted by CSH (Tulchin and Hammatt 2011) identified a discontinuous segment of the OR&L berm (SIHP No. 50-80-01-2489) and two post-Contact habitation sites (SIHP No. 50-80-01-7144 and -7145) in the Project area.
Section 6  Previous Oral History Research

In 1976, the Ethnic Studies Program at the University of Hawai‘i at Mānoa undertook the Ethnic Studies Oral History Project to “record and preserve interviews with individuals who have recollections of events and personalities that would be of value to the community” (UH 1977:v). Waialua and Hale’iwa were the communities first documented in the project and these volumes provide glimpses into life during the sugar plantation era. This section builds on the previous cultural and historical background sections by highlighting the voices of Philip Ninomiya and Manabu Nonaka. Their personal stories add detail to the cultural and historical background of the area and they compliment the information provided by living kūpuna and kane‘a‘ina who were recently interviewed by CSH (detailed in Section 7). Their memories depict the value of natural resources of the area: as utilitarian items, in children’s play, and as important elements of local diets. Their stories also indicate that Anahulu Stream and Hale‘iwa Bay were clearer and more productive.

6.1 Philip Ninomiya

Philip Ninomiya was born in Hale‘iwa on December 22, 1906. His parents came from Japan to work on the Waialua sugar plantation. He talked about the use of natural resources and their role in diet when he was growing up. In the following excerpt, AA is Araceli Agoo, the interviewer, and PN is Philip Ninomiya.

PN  We used to have fish peddlers. This area used to be called ryoba, fishing village. Ryoba. The fishermen lived just beyond our house. Many fishermen lived there. Most of the diet consisted of fish, eggs and things like that. Mr. Aoki’s mother used to bunch up two or three aji and sell them. Is that adole [big-eyed scad fish]?

AA  The fish?

PN  Yeah.

AA  Yeah.

PN  She would tie them together with this reed that grew along Anahulu Stream. It was called akakai (reed).

AA  Is that Hawaiian?

PN  Yes. (UH 1977:277)

Mr. Ninomiya explains how plants and water resources were integral to their experiences as children:

PN  When we were small, we used to go upstream and cut akakai, tie them up and make them into rafts. We used to go up and down on akakai rafts. Boy! We used to have lots of fun. There was a very large akakai tree beyond this place.

AA  There’s still a hau tree there. A little hau tree.

PN  Yeah, but then, this was a huge one, growing—right beside the river. And we used to climb the tree and build tree houses.

(AA chuckles)

PN  Really fun. Children now a days have to have store toys, you know. But we used to make all kinds of things. We used to make…this hau sword. Get a hau branch, and cut a ring at one point. You tap the side of the hau where the sword’s blade would be. You keep on tapping. When it becomes loose, out comes a round sword. The scabbard is the hau bark. We used to play with these swords; we had lots of fun. We just had to make our own toys in those days. There used to be a railroad bridge right there. (UH 1977:277)

AA  Okay, can you explain more to me about the akakai rafts? How did you make them? Seems really interesting.

PN  You know, I don’t see akakai anymore, but it’s a reed. It just grows straight, and it’s very buoyant. So. You cut them with a sickle, and tie them with a cord, and make a raft. You made your own paddle. You’d go up and down Anahulu Stream.

AA  You don’t know, by any chance, what is the scientific name for this akakai reed?

PN  Well, that’s the Hawaiian word, but I wouldn’t know. I wouldn’t know the technical name of akakai.

AA  And as far as you know, there isn’t none any more?

PN  I’m sure it’s growing somewhere, but I haven’t been up that stream at all in recent years.

AA  It’s Anahulu Stream where it’s growing at?

PN  Yeah. (UH 1977:302)
Manabu Nonaka (MN) was born in Honolulu on June 4, 1915. His father was a taxi driver in Waialua but passed away when Mr. Nonaka was seven years old. His mother ran a shop and his stepfather worked at the Haleiwa Hotel as a pump man. On July 5, 1976 Howard Nonaka (HN) interviewed Mr. Nonaka in Haleiwa. Mr. Nonaka talks about a typical day when he was growing up in Haleiwa:

**HN**: Where was the tree? You know the date trees, and ... you used to go all over Waialua for pick date trees, and you used to go all around for some money, so we had to look for some money.

**MN**: Well, early life, we didn't have too much money, so we had to look for some money, whether from dates, plums, mountain apples, and also sugar cane. In those days, sugar cane was hauled by train, so we had to wait for the train to go by and pick from the sidecar, and that's how we had our sugar cane. That was part of our candy.

**HN**: Where was the tree? You know the date trees, where you used to go for pick dates?

**MN**: Well, the date tree was close by. We usually get up early in the morning, the season is sometime in the summer, so it wasn't too bad. But we had to get up at break of dawn and be the first to be there, see. We can get enough for ourself.

**HN**: What about the plums and mountain apple?

**MN**: Well, the plum and mountain apple was seasonal, too. Well, there was no rush in that, because we had to climb the tree and get it. Mountain apple usually come during the summer, also. But, the mountain apple, we had to go into the valley, which was about five miles. But we went as a group.

**HN**: All walk?

**MN**: Yeah. All walk. No car, no bicycle, just walking barefoot down the mountain path to the valley.

**HN**: And the plum?

**MN**: Yeah, we used to pick them from the tree, and also, sometimes we had to climb the tree and get it. Boy, we make sure we stay low. And also, we used to pick mangos, too. And mangos were a delicacy those days. We didn't have no Hayden mango like we have today. And, you know the good wines, the old wines, they use to make quite a bit of money, too. Same people used to make two dollars, three dollars.
And in those days, two dollars, three dollars was a hell of a lot of money. You know, we used to work in the cane field when we was very young. Say, about ten years old, we used to only get 25¢, 35¢ for the whole day.

HN Okay. What other recreation did you guys have those days?

MN Well, recreation was very limited those days, and we had to make our own recreation. So what we used to do was we had Anahulu Stream right close by. And we used to make akakai boat. Akakai those days used to come so tall. Used to come better than eight feet. So, we bundle 'em up together, and we tie it up and shape it like a boat, and we used to ride on it. We go fishing, and go joy riding up and down the Anahulu Stream.

HN What is that? The akakai?

MN Well, that's a weed. I still see it growing, but it doesn't grow as tall as it used to. It's a weed growing in the water that float if you cut it and bundle it together.

HN How did the river look then?

MN Well, the river, then was not as much polluted as today, and it was much shallower than what it is now, because those days was doing natural; no digging was done by any mechanical equipment.

HN No boats, then, in the river?

MN There used to be some fishermen. Very few, but the fishing boat used to be more close to the ocean, the mouth of the river. (UH 1977: 430–432)

HN What about fishing? You used to go fishing all the time, eh?

MN Well, my younger days, I used to be crazy about fishing and those days, they had so many fish. I'm talking about something when I was a teenager, you know. 1920s. We used to go the river or the mouth and we used to hook papio [young stage growth of 'ua, or crevalle, jack, or pompano], holehole [holehole, juvenile Hawaiian flagtail]. During the season, papio, I used to hook about hundred, hundred fifty. And holehole...holehole was smart fish, then. Still is today. During the season, we used to have the baby mo [threadfish] and we hook lot of oama [young of the weke or goatfish], too. And we used to catch lot of shrimp. And that shrimp, we used to eat. We use it for okazu [side dish], too, just like aside for the rice. And we used to pick some seaweed, but some of the vegetable, we used to raise, so we didn't have to buy too many things.

HN What about akakai?

MN I used to love my akakai. I still like my akakai, so, mostly, I used to catch my seaweed, like the small papios which measure about two, three inches. Today it's illegal, but those days, wasn't illegal. And shrimp, which we fry it, and which you could cook in soyu. And vegetable, too. Cook it. Come (vegetable) we could afford (to buy).

HN What about tako? Who taught you how to look for tako?

MN Well, tako came naturally to me, because I follow this one person. Well, I had to learn. As long as you follow anybody, you just watch how he catch stuff so you can catch.

HN That's 'cause you don't go diving anymore there.

MN Well, I do go. Very seldom, but...you know, when you go pick ogo [seaweed], then, maybe, sometime you lucky. You see one tako. You see one, mostly likely you'll catch because tako is not that smart.

HN (Laughs) What about stuff like opihi [limpets] and ogo, like that? Used to have more before?

MN Well, opihi was something we had to go Waimea Bay to get, and we wasn't that good a swimmer so, that was left up to the bigger boys who pick some opihi. But today, I don't think we have any there already.

HN And used to be big kind opihi or small?

MN No. It wasn't big. Waimea Bay maybe, had. Yeah, they might still have some, but used to be always small.
Section 7  Community Consultation

Throughout the course of this CIA, an effort was made to contact and consult with Hawaiian cultural organizations, government agencies, and individuals who might have knowledge of and/or concerns about cultural resources and practices specifically related to the Project area. The community consultation effort was made by letter, email, telephone and in person. In the majority of cases, letters along with a map and an aerial photograph of the Project area were mailed (see Community Letter Appendix E).

Several attempts have or will be made by mail, email and telephone to contact individuals, organizations, and agencies apposite to the subject CIA. These efforts are ongoing. The summary of consultations are presented in below in Table 3.

Table 3. Summary of Community Consultation

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrigo, Marlene</td>
<td>Kama‘aina</td>
<td>June 15, 2010 CSH sent letter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>June 28, 2010 Ms. Abrigo sent email</td>
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<tr>
<td></td>
<td></td>
<td>expressing interest in participating but</td>
</tr>
<tr>
<td></td>
<td></td>
<td>saying she was busy with ‘ohana graduations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>August 5, 2010 CSH sent reminder email</td>
</tr>
<tr>
<td>Aagaard, Uncle Buzzy</td>
<td>Volunteer at OHA</td>
<td>September 20, 2010 CSH called and left message</td>
</tr>
<tr>
<td></td>
<td></td>
<td>September 22, 2010 Tiona returned call on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>behalf of Mr. Aagaard</td>
</tr>
<tr>
<td>Alameda, Kalani/ Jeffery</td>
<td>Kama‘aina</td>
<td>July 12, 2010 CSH left message</td>
</tr>
<tr>
<td></td>
<td></td>
<td>August 15, 2010 CSH left message</td>
</tr>
<tr>
<td></td>
<td></td>
<td>September 6, 2010 CSH left phone message</td>
</tr>
<tr>
<td>Name</td>
<td>Affiliation</td>
<td>Notes</td>
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<td>Name</td>
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<tr>
<td>Causey, Emmaline</td>
<td><em>Kamaʻāina</em> from Haleʻiwaa area</td>
<td>June 15, 2010 CSH sent letter; June 23, 2010 CSH conducted interview in Mrs. Causey’s home (See Section 8.5); Authorization form received from Mrs. Causey; June 28, 2010 CSH called to follow up with a few questions and clarification about the interview; July 19, 2010 CSH mailed her the interview summary; August 3, 2010 CSH returned call to follow up with interview corrections and Mrs. Causey said she would call back; September 22, 2010 interview summary corrected and confirmed</td>
</tr>
<tr>
<td>Cayan, Phyllis “Coochie”</td>
<td>SHPD Cultural Specialist</td>
<td>June 15, 2010 CSH sent letter; June 22, 2010 reply received (See Section 7.1)</td>
</tr>
<tr>
<td>Canon, Diane</td>
<td><em>Kamaʻāina</em></td>
<td>September 21, 2010 CSH emailed letter; September 22, 2010 Ms. Canon replied via email; CSH conducted interview via phone (See Section 8.6), and then emailed interview summary and authorization; September 27, 2010 Interview approval and authorization form received by CSH via fax</td>
</tr>
<tr>
<td>Harvest, Dino</td>
<td>His ohana are <em>kamaʻāina</em></td>
<td>July 12, 2010 CSH left message and Mr. Harvest returned call. CSH emailed letter and maps; July 23, 2010 CSH interviewed Mr. Harvest at Honolulu Hale; Authorization form received; July 28, 2010 CSH emailed interview summary, but it was returned; August 16, 2010 CSH mailed interview summary to Mr. Harvest’s work address; August 31, 2010 CSH emailed to follow up, and Mr. Harvest replied and requested that CSH resend summary; September 10, 2010 CSH called and over the phone, using Google Maps, Mr. Harvest identified the fishing shrine he used to visit in the 1970s; He said that in two more weeks he would send interview corrections and additions; September 27, 2010 CSH left message</td>
</tr>
<tr>
<td>Name</td>
<td>Affiliation</td>
<td>Notes</td>
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<td>--------------------</td>
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<td>----------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Helemano, Butch    | Kahu (caretaker) of Pu`u o Mahuka heiau | July 6, 2010 CSH emailed letter and maps  
July 7, 2010 Mr. Helemano returned the email  
July 8, 2010 Mr. Helemano called CSH and agreed to be interviewed on July 18, 2010 at his school in Waimea Valley  
July 8, 2010 CSH mailed the letter, maps, and list of interview questions; Mr. Helemano responded in an email  
July 19, 2010 CSH conducted interview with Mr. Helemano at Waimea Valley (See Section 8.3); Authorization form received  
August 11, 2010 CSH emailed interview for approval  
August 11, 2010 Mr. Helemano emailed approval for the interview |   |
| Jenkins, Aunty Betty | Waimea Valley - Kupuna | June 15, 2010 CSH sent letter by email  
July 6, 2010 CSH called. Mrs. Jenkins said that she had only lived in the area for fifty years, that it is not her piko [commonly meaning birthplace], and that she would like to learn about it from those I talk to; She referred other knowledgeable people |   |
<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Notes</th>
</tr>
</thead>
</table>
| McKeague, Mark Kawika | Chair, Oahu Island Burial Council                                            | June 15, 2010 CSH sent letter by email  
June 15, 2010 Mr. McKeague forwarded email to Ms. Leimaile Quitevis, the OIBC Waialua representative  
September 20, 2010 CSH emailed updated letter again  
September 22, 2010 Mr. McKeague responded with an email saying he forwarded it to Ms. Quitevis again |
| Nānu‘o, Clyde    | Administrator, Office of Hawaiian Affairs                                    | June 15, 2010 CSH sent letter  
October 1, 2010 OHA sent letter (See Section 7.2 Section)  
September 20, 2010 CSH emailed updated letter again  
September 22, 2010 Mr. McKeague responded with an email saying he forwarded it to Ms. Quitevis again |
| Nihipali, Kunani | Cultural lineal descendent                                                  | June 29, 2010 CSH emailed letter  
August 5, 2010 and August 16, 2010 CSH emailed letter again |
| Orr, David       | Waimea Valley Botanist                                                      | July 12, 2010 CSH called and described Project, emailed letter and maps, and agreed to talk after the first week of August  
August 5, 2010 CSH emailed to arrange time to talk  
August 12, 2010 Mr. Orr returned call  
August 15, 2010 telephone interview; CSH Emailed interview summary and authorization forms  
August 16, 2010 Mr. Orr approved interview via email  
August 18, 2010 Mr. Orr faxed authorization form  
August 26, 2010 Mr. Orr emailed list of botanical species he observed in Project area |
| Pua-Nichols, Cynthia | Wai‘alua Hawaiian Civic Club                                                | June 15, 2010 CSH sent letter |
| Shirai, Thomas   | OHA-Native Hawaiian Historic Preservation Council, Past Member Oahu Island Burial Council, Lineal Descendant, Cultural and Historical Traditions of Waialua | June 15, 2010 CSH sent letter  
June 28, 2010 CSH sent email  
July 19, 2010 CSH and Mr. Shirai said he would email his comments |
| Salazar, Owana   | Kama‘aina,ohana have lived in area for generations                         | July 12, 2010 CSH left message  
August 9, 2010 CSH left another phone message |
7.1 State Historic Preservation Division

CSH contacted Phyllis “Coochie” Cayan, History and Culture Branch Chief of SHPD, on June 15, 2010. In a written response sent to CSH on June 22 (Figure 25), 2010 Ms. Cayan states that SHPD recommends speaking with the core families of the area who can recall previous land use to get a glimpse of any cultural practices that may be impacted by the Project. She also suggests contacting the North Shore Neighborhood Board, staff at Waimea Falls, and area senior citizens groups. She also lists three other individuals to contact. Ms. Cayan writes that SHPD concerns include potential disturbances to burials in area, and possible impacts to shoreline access and gathering rights.

<table>
<thead>
<tr>
<th>Name</th>
<th>Affiliation</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silva, Janell Chun</td>
<td>Kamaʻaina, ohana have lived in area for generations</td>
<td>June 15, 2010 CSH sent letter</td>
</tr>
<tr>
<td></td>
<td></td>
<td>June 23, 2010 CSH left voice message</td>
</tr>
<tr>
<td></td>
<td></td>
<td>July 6, 2010 CSH emailed letter</td>
</tr>
<tr>
<td>Topolinski, John R. Kahaʻi</td>
<td>Kamaʻaina</td>
<td>June 15, 2010 CSH sent letter by email</td>
</tr>
<tr>
<td></td>
<td></td>
<td>June 15, 2010 Mr. Topolinski replied by email and referred to several significant events that took place in the area (See Section 7.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>August 5, 2010 CSH emailed follow request for information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>September 24, 2010 CSH emailed request to include Mr. Topolinski’s quote from the email in the report</td>
</tr>
<tr>
<td></td>
<td></td>
<td>September 25, 2010 Mr. Topolinski approved the quote</td>
</tr>
</tbody>
</table>
7.2 Office of Hawaiian Affairs

CHS contacted Clyde Nāmūʻo, Administrator of OHA, on June 15, 2010. In a written response sent to CSH on October 1, 2010 (Figure 26), OHA recommends contacting Thomas Shirai, the Mokuleia Community Association, and the North Shore Community Association.

7.3 John R. Kahaʻi Topolinski

On June 15, 2010 Mr. Topolinski replied by email and referred to several significant events that took place in the area:

I know it was famous for its ancient prophets and seers. It could be tied in with Kanaloa the god of the sea. These areas were sacred to Oahu chiefs such as kualii and others. It is also a favorite place for the Kauai chiefs who often married in to the chiefly lines of the ali of Oahu. This section and most of the north shore is where fleets of canoes were launched and received by both Oahu and Kauai ali and makaainana as it is close to kukaniloko, lihue, and kaena. This is the info. I have based on my wife’s genealogies who is a direct descendant of kualii and the pahu chiefs."
Near Waimea Valley, Mr. Helemano’s relatives, the Hobron Ohana, lived in a home people referred to as the humana house because of strange noises that would emanate from it. Mr. Helemano suspects they could have been due to rats whistling in the wind.

8.2.3 Project Area Features and History

Of the Project specific area, fishing from there has not been used recently by local residents. It has been a known location of Kahuna activity. He says, “Lama’alama valley is an area in Waimea Valley that was used as an informal dump site in the post-Contact era. Twenty-five or thirty years ago, Mr. Helemano estimates the Project area itself does not have any pre-Contact features, but it may have been used as an informal dump site in the post-Contact era. He also notes that the ancient kapu system was still in place up to a few feet deep and was an area by itself in about 1972, and there is a known location of Kahuna activity.” He sees Waimea Valley as being critical to the Kahuna activity.

In terms of natural resources, Mr. Helemano describes the Project area as being a well-known location for fishing and kahuna na'au欧 activities. He notes that in ancient times, the whole area was well-known for the abundance of ‘alakahai and that it is still valued for marine resources such as ‘ai‘opu‘u and ‘auwana. He also notes that the area is still important for its native plants and has been described as the “haunted house” because of strange noises that would emanate from it.

8.3 Method

Mr. Helemano states that the local community does not have any pre-Contact features, but it may have been used as an informal dump site in the post-Contact era. Twenty-five or thirty years ago, he located many modern cultural materials, including European medicine bottles, which were used to bring the modern material to Waimea Valley.

The authors and researchers of this report extend our deep appreciation to everyone who took the time to speak and share their experiences and memories about the proposed Project area. We request that if large excerpts from interviews are used, the words of contributors are reproduced accurately and not in any way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewees.

8.3.1 Connections to Project Area and Environs

In the area of the project, most of it has not been used for pre-Contact features, but it may have been used as an informal dump site in the post-Contact era. Twenty-five or thirty years ago, the area was used as an informal dump site in the post-Contact era.

Kumu a'o (teacher, organizer) for the Ka Papa Oihana (Traditional Knowledge Project) held in 2010 on the North Shore. The authors and researchers of this report extend our deep appreciation to everyone who took the time to speak and share their experiences and memories about the proposed Project area. We request that if large excerpts from interviews are used, the words of contributors are reproduced accurately and not in any way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewees.
from this time include Ka‘opūpūpūlulu, the officiating kūhuna at Kupopolo, and his son Kahulupe. Ka‘opūpūpūlulu built Pu‘u o Mahuka Heiau and later Kupopolo Heiau. Mr. Helemano explains that although many famous chiefs are associated with Waimāna Valley after the time of Kahulupe, they came during the take over of Kāhekī and they weren’t really kama‘aina of O‘ahu—although they were uncles and nephews and cousins of kama‘aina. “The sovereignty aspect is difficult to discuss because even though one came from Moloka‘ī and one came from Maui, and captured the others in 1895, they were uncles and aunts and sisters and brothers,” he elaborates.

Mr. Helemano is well-versed about this storied landscape. He explained that Pu‘u o Mahuka, literally means “hill of escape” and was built about 1600 on the old site of a heiau that was built about 1400. From this point, he says that it is possible to see across the ocean toward Kaua‘i. He explains that Kupopolo, which means “to see with eyes and mind” did not serve the purpose as a place where Ka‘opūpūpūlulu could have visions. Off shore from Kupopolo Heiau, in front of Ke ‘Ahu o Hapu‘u is the small yet famous moku (island), Wānanapa‘aoa, which means “unsuccesful prophecy” and refers to the “vision discarded.” Across from this moku is the Project area, Kāpela, which means “to put aside, or cast out, as with rotten food” and refers to Ka‘opūpūpūlulu’s visions that were not read correctly at Kupopolo Heiau. Mr. Helemano stressed that an important mo‘olelo about the area is that of Kāne‘Au kai, a shark god and ‘o‘omaikoa (deified ancestor) who is related to Pele. Mr. Helemano says there are actually two mo‘olelo about it, and the accepted concept is that the image of Kāne‘aukawai was set up in the heiau by the two kīhuna that lived there.

8.3.4 Recommendations

1. Consider how the view of the structures will look from the road. The more rustic and low-lying the buildings are, the better. Refrain from building a big stone wall around the property. Use native plants to cover the buildings or make them blend in with the landscape.

2. Plants grown at Ka‘ena Point, including pohihiha [pohihiha] or beach false sandalwood, are appropriate for planting in this area. Use Ka‘ena Point as a model for planning what to use to re-vegetate the Project area.

3. Whatever takes place there should be shared with all Hawaiians and not just those who belong to a particular school or entity. The whole community should be able to participate in projects or programs there.

4. People should still be able to access the shoreline. The area already inhibits access because it is fenced off and gated with “keep out” signs which are “insulting.” Use “Kapu” signs instead.

Figure 27 Mr. Helemano demonstrates traditional wood carving techniques as part of his Ka‘ahu‘u‘ula heiau. He explains that it is difficult to discuss because even though one came from Moloka‘ī and one came from Maui, and captured the others in 1895, they were uncles and aunts and sisters and brothers.”

8.3.5 Referrals

Mr. Helemano recommended that CSH contact Joe Kennedy (archaeologist); Martha Yent (archaeologist); kūpuna at Waimāna including Aunty Ka‘ula and Aunty Dot Auwai; and Wayne Holu (descendant of Hewahewa).
and taught at what was then called Waialua Elementary. Mrs. Causey’s paternal great-grandfather, Mr. Henry Plemer, was a judge at the Waialua Court House in Hale‘iwa.

Mrs. Causey’s mother, one of twelve children, was born in a house that is still standing outside of Hale‘iwa town, past Thomson’s corner at an area that was formerly known as Souza Corner, because of her family’s presence in the area. Mrs. Causey’s father had about half an acre off Lokoia in Hale‘iwa town between Kamehameha Highway and Hale‘iwa Road behind what is now Jameson’s By the Sea. He had a piggery there and now Mrs. Causey’s brother has the property. Mrs. Causey remembers that her father worked as a mechanic for Waialua Sugar for 43 years before he retired. He also worked at a gas station to supplement his income and continued working there after his retirement to supplement his pension. In the 1950s and 1960s, her mother worked as a baker, chef, and school bus driver to help support their family. Because Mrs. Causey is the first born, she was delegated considerable responsibility for helping to raise her six younger siblings. Her father passed away in 1992 and her mother continued working as a butcher at the supermarket in Hale‘iwa until she died in 2006 from Leukemia.

8.4.1 Causey property

Mrs. Causey’s mother and her mother’s youngest sister were brought by their father on a little boat from the water near Jameson’s By the Sea to the marshy area near the old pump station at the ranch where she lives now. (The marsh is fed by artesian springs.) She reminisced that, “it used to be all clean and nice.” They would fish and have a nice time. In particular she recalls they caught plenty of ʻāhōlehole, something that is no longer possible as the marsh is now managed by the DLNR and no one is allowed in it. Furthermore it is choked with reeds and the water is not passable by boat now, she adds.

The property where she lives used to be leased by Mr. Vasconsalles and then by George Q. Canon and Mr. James Causey (Mrs. Causey’s husband, now deceased). Mr. Causey used to help Mr. Cannon with the ranch and in 1965 the ranch was turned over to her husband. They used to have 240 acres that went all the way to the Hale‘iwa Beach Park but she now has only 120 acres. Mrs. Causey also leases 11 acres from Dole near the marsh. She has been on the property for 25 years and still keeps some cattle. The land was from her property is being used by Kamehameha Schools for diversified farming. Corn seed (from Monsanto), tuber rose, and papaya are a few of the crops grown there.

Her property contains a number of archaeological features of interest that are checked annually by Mr. Jan Becket of Kamehameha Schools. (See Section 8.7 Interview with Jan Becket.)

The old railroad track that used to transport sugar cane runs just behind her property. Sometime before 1961, the year Mrs. Causey graduated from high school, she recalls how Waialua Sugar stopped transporting their sugar cane on the railroad and began transporting it with large cane haulers on the road. They had no need for the railroad any longer, and she recalls how she and her other neighbors got to ride the rail on its last trip. (See Figure 28 for a historic photograph from that time.)

8.4.2 Souza beach house

On September 20, 2010, Mrs. Causey took CSHP to an area approximately 300 meters from the Project area (on the Hale‘iwa side) to point out a lot that used to contain the beach house where her mother’s family congregated throughout her childhood and continued to gather until about twenty or so years ago. At one time, Mrs. Causey had 39 cousins and they all used to meet at that beach house and spend time together, especially during the summer. She has fond memories of swimming all day and eating her grandmother’s yellow cake with watermelon. There was a big rock just off shore where she and her cousins learned to swim. No one surfed right there because it is too rocky and not good for surfing, she says, although she added that nearby is a surf spot known as Alligators. She and her cousins enjoyed snacking on sea grapes that grew along the coast. They also gathered limu including e'oke and another thick kind of limu that was called pokpokula (by the Filipinos), wāwāwākole (in Hawaiian), and rabbit's foot. They prepared it by mixing it with tomato, onion, and vinegar. Mrs. Causey’s uncles and older cousins would fish from this property and catch ʻākule (big-eyed scad), kāmī (goatfish), ʻīwieweʻo (bigeye), manini (convict tang), and ʻāhōlehole. She and her cousins also gathered limu, ʻōpīhi, and pipipi (pearl oyster) Her grandmother would boil the pipipi and give them a needle to scoop out the flesh to eat. They also gathered there for special occasions. For example, she recalls and Easter Egg hunt when she and her cousins found money hidden by her Grandmother’s brother. They had many līʻai (feasts) there, as well.

When Mrs. Causey was growing up, the property was owned by Bishop Estates. After her family gave up the lease it was taken over by her uncle, and then by a woman who worked for Kamehameha Schools who eventually gave it up because the property taxes became so high. Mrs. Causey’s cousin, Diane Canon, still has a month-to-month lease on the house next door to where the family beach house stood.

8.4.3 Waialua Sugar Plantation Camp

About a ten minute walk from where she now lives, was the Waialua Sugar Plantation Camp. “It used to be the most beautiful plantation camp you saw,” Mrs. Causey recalls. They had a gym, pool, store, and gas station. She has fond memories of climbing mango trees and roller skating with her friends and classmates who lived there. Hawaiian, Japanese, Filipino, and Portuguese families lived there. They also used to walk on old cans of Carnation evaporated milk by using the sticky Ganduli Bean sap to make them adhere to their feet for homemade stilts. She recalls the place as nice, safe, no problems and seems to contrast this with today’s problems in the area like squatters and homelessness. In 1995 Waialua Sugar went out of business and the entire camp was bulldozed.

8.4.4 Puaena Point

Puaena Point used to be an airfield. As a child, she rode go-carts there. She also recalls that people gathered seaweed there. Mrs. Causey notes how, these days people don’t cut seaweed as they should, they uproot and destroy it completely so it cannot continue to grow.
8.4.5 Recommendations

When staffing the Learning Center, consider local people, instead of hiring from the mainland. "We have knowledgeable people that will take care of the land," she explained.

8.4.6 Referrals

Mrs. Causey recommended that CSH contact Jacob Ng of North Shore Neighborhood Board and Community Association; John Hirota of her church board; Pat Sagon, a friend; and Diane Canon, her cousin. She says that families that have been in the area for generations include the Ho'okala, Holt, and Kahalewai.

8.5 Diane Canon

Mrs. Diane Canon (maiden name Sato) was born in 1943 in Hale'iwa and has lived there all her life. She is now the Director of nursing at long term care facility in Wahiawa. Mrs. Canon has spent a lot of time very near the Project area. As a cousin of Mrs. Emmaline Causey (see Section 8.4), she also has fond memories at the Souza beach houses.

8.5.1 Souza beach houses

Of the four houses that used to be on that lot, each one was assigned to a Souza uncle. These were actually constructed of barracks from Schofield. She recalls. This was the site for many family gatherings and fond memories beginning approximately in the late 1940s until about the mid-1950s, primarily during her teenage years.

"The legends and stories that surround the area are not familiar to me and my parents never divulged any information about the cultural significance of the land. I do know that as children, we used to help the families collect 'gali' and other 'akeake (crabs) and fish from the surrounding beaches for the family parties, while the older cousins and uncles went out to fish in the deap waters. I remember that my parents eventually moved into that house that my parents eventually moved into, that were weekend vacation homes for the Souza families."

She remembers going to the rock island off shore for swimming and collecting marine resources. She notes that the rock used to be larger and has eroded to about 2/3 of its previous size. The older Souza boys would do night fishing (dropping the net at night) or spear fishing. Since they fished just off shore from the beach houses, they caught reef fish like moana, and 'ula. As a young girl, she got good at catching the fish. According to her, that rock is "just turtles there now." The family also had an 'imu (earth oven) there and cooked kalua (to bake in a ground oven) pig sometimes.

Today, only one of these four houses remains, the one that used to belong to Uncle Bernard Souza (who was married to her mom's sister). In 1969, Mrs. Canon's parents moved into that beach house to live, but because she was already married, she never lived there herself. Her father passed away in 1986. Mrs. Canon's younger sister, Donna, now lives there.

8.5.2 Fishing altar

Mrs. Canon's husband's maternal ancestors, the Kahalepauole 'ohana, date back to the ancient Hawaiian families who lived in Waimea Valley. They were one of 49 families that first settled in Waimea valley. They were given property by one of the Huns and the valley was called the prairie. She described how his family went to court over past ten years in efforts to retain the property, but ended up being compensated for the land which is now zoned as "conservation land." Her husband's sister (now deceased) once told them "one of his relatives built a fishing altar at the point just before Waimea Bay." When asked by CSH, Mrs. Canon confirmed that this was the point just before Waimea Bay.
8.5.3 Lokoea Fishpond

"My knowledge is mostly of the Lokoea Fishpond where I grew up for the first eighteen years of my life. There an old, so Mr. Sato ran the restaurant and raised his children alone. Because he was interned during World War II, his son (Mrs. Canon's father) took over running the restaurant. They lived next to the apartment store, Fanny took care of Diane and helped out at the house when her mother was away in 1951 when he was 90 years of age. Mrs. Awai-Lennox is now a retired secondary school principal. Throughout her life, she has lived part time in Hale'iwa, and about ten years ago she returned to her family's old home. Mrs. Awai-Lennox is familiar with the Project area and has spent much of her life living in the area surrounding it. She shared her recollections of the area from Hale'iwa to Kawailoa with the Heritage Project.

8.6 Gladys Awai-Lennox

In 1929, Mrs. Gladys Awai-Lennox was the second of four children born to George Ehuana Awai and Beatrice Chang Hoon Avai in Honolulu. Her mother was from the Liliuokalani area on the island of Maui, and her father was a well-known fisherman. Gladys was educated in Honolulu and then returned to her home island, where she began her career as a teacher.

Because her parents were always busy working in the appliance store she had a "honau" (refrigerator) and a "kupa" (washing machine) to help with the household chores. Her father was a skilled fisherman who taught her about catching fish in the deep water near the reef. Gladys later married David Lennox, and together they raised their children in the same house.

8.6.1 Project area and vicinity

The Fishpond was a very important part of Mrs. Canon's life. She fondly describes how she grew up around the pond and how her family used it for various purposes. "I am so glad KS is working on restoring it!" she says. The Fishpond was used for swimming and fishing, and had a strong cultural significance for the people who lived near it. Gladys is nostalgic about the Fishpond and says, "I believe having such a center at the site would be wonderful and the experience our children should learn about our area.

8.6.3 Recommendations

Mrs. Awai-Lennox has no concerns about the Project and says, "I believe having such a center at the site would be wonderful." She recommends that the area be preserved as a cultural landmark and that it be used as a place for educational programs.

Mrs. Awai-Lennox grew up in the Fishpond area and has spent much of her life living there. She shared her recollections of the area from Hale'iwa to Kawailoa with the Heritage Project. Mrs. Awai-Lennox has no concerns about the Project and says, "I believe having such a center at the site would be wonderful and the experience our children should learn about our area." She recommends that the area be preserved as a cultural landmark and that it be used as a place for educational programs.

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8.6 Natural and Cultural Resource Use

"Even though we weren't considered poor, we lived off the uplands and ocean. This was back in the days of sustainability," she remarks.

8.6.1 Marine resource gathering

Fishing has been a significant activity, it was a group effort and a family activity that provided sustenance for everyone. The area was also a great fisher. "We fished from Kawailoa up to Kauhala and beyond, depending on the availability of the fish. Our mother used to go to Waimea with friends and family to collect fish. She explains that this method was especially effective for fishing during the night. They would take a light and throw handfuls of fish into the net. The fish would then swim towards the light. They used this method because it was a lot easier to catch fish during the night. Mrs. Awai-Lennox explains. She recalls being woken up when it was still dark by her father and there was a light. Her father and uncle would go out fishing. They practiced a method called "pa'i pa'i," which is a term used to describe a fishing method in which a large group of people surrounding the water to scare the fish into the nets. They used old ropes for this method.

8.6.2 Family Kula in Hale'iwā

You can find their family kula (pond) in Hale'iwā. Their kula is located near the train tracks that used to run through their land. Their family used to have their own kula and they would catch fish from it. They would then cook the fish and eat it. Mrs. Awai-Lennox describes the Kawailoa area as having cultural and historical significance as their family used to own property adjacent to Kawailoa. They would catch fish from the kula and eat it. Mrs. Awai-Lennox explains. She recalls being woken up when it was still dark by her father and there was a light. Her father and uncle would go out fishing. They practiced a method called "pa'i pa'i," which is a term used to describe a fishing method in which a large group of people surrounding the water to scare the fish into the nets. They used old ropes for this method.

8.6.3 Childhood influences

Important influences during her development included her family, her Congregational church, her public school, and her close friends. Mrs. Awai-Lennox attended a public school and was bilingual. Her family was very influential in her development, especially her father. Her father worked for the Land Office and was bilingual. Her family was also very influential in her development, especially her father. Her family was very influential in her development, especially her father. Her father worked for the Land Office and was bilingual. Her family was also very influential in her development, especially her father. Her father worked for the Land Office and was bilingual. Her family was also very influential in her development, especially her father. Her father worked for the Land Office and was bilingual.
8.7 Jan Becket

Mr. Jan Becket lives in and grew up in Manoa. He teaches photography at Kamehameha Schools. He has co-written a book, 'Aloha in the Classroom,' and teaches photography at Kamehameha Schools. He has co-authored several books, including "Photography and the Islands" and "The Art of Photography in Hawaii." He has also published articles in photography magazines and journals.

8.6.3 Birds

Mrs. Awai-Lennox's family gathered both kiawe and hala trees on special occasions for family members. The red hala tree, which is particularly beloved by Mrs. Awai-Lennox as she recounts how her father would make red hala fruit segaments as it was also nourishment in hard times; and kiawe (from Kahuku, Roy Benim, who is in his late 80s, and he told her of kapuna years ago, Mr. Becket happened to meet a relative of Mrs. Causey while he was visiting. He recalled that there was a respected elder Hawaiian man who used to live near the structure and that there used to be a large stone platform there, although it was not present at the time of their discussion.

1. Platform at a rock outcrop that also has features such as outrigger below the outcrop

2. Butterflies' common Hawaiian place name in the area. For example, plumeria is the Plumeria rubra, commonly known as "borer" or "borer" in Hawaiian.
On July 22, 2010 CSH visited Mrs. Causey’s property with Mr. Becket in order to view some of the structures on that property and on the neighboring property (on the Hale‘iwa side). At the time CSH toured the area with Mr. Becket, it was part of a 16-acre parcel being offered for sale by the George H. Holt estate, through Sterman Realty. Beyond that parcel lies a parcel that Dino Ventura is acquiring from Dole Corporation. Stretching from the Causey property through Mr. Ventura’s land lies an extensive complex, with what appear to be walls, ahu, platforms, enclosures and possibly a bell stone (a stone with a thin ledge and strike marks at one spot that rings when struck) (see Figure 38). Although there are no fences to mark property boundaries, it appears that an especially high concentration of sites lies on the Holt estate.

Mr. Andy Anderson (now deceased) who knew a lot about the Kawailoa area, told Ms. Marian Kelly (emeritus faculty at UH from Cultural Studies), who told Mr. Becket that one local tradition places Kapukapuakea Heiau mauka of the Ukoa pond and in the vicinity of Mrs. Causey’s property. (Mr. Becket explains that many other references place Kapukapuakea Heiau at Kaiaka Bay.) Later Mr. Becket visited the adjoining Holt property with Mr. Thomas Shirai and...
they viewed the sites together. The counterpart to that kahuna is Taputapuakea Heiau located in
Kaneohe on the windward side of O'ahu which was described by both Mr. Becket and Pobalau. This
kahuna is described as related to the Hula dance and called the "Hula Kahuna" by Mr. Becket. Mr.
Becket and Mr. Mitchell said that this heiau was built by Kamehameha and that it was used for
prayer and for dance. Mr. Becket said that the heiau is now a site for the Hula dancers and that
it is a place where the dancers can offer prayers to the god of dance. They said that the heiau
is located in a beautiful location and that it is a place that is very special to the Hula dancers.

In addition to the sites that Mr. Becket and Mr. Mitchell visited, they also visited the
Kupopolo Heiau located on the west side of O'ahu. This heiau is described as being
associated with the Polynesian culture and it is used for prayer and for dance. Mr. Becket
said that the heiau is located in a beautiful location and that it is a place that is very special
to the Hula dancers. They said that the heiau is located in a beautiful location and that it is a
place that is very special to the Hula dancers.

Overall, Mr. Becket and Mr. Mitchell said that the sites that they visited were
very important and that they were able to learn a lot about the culture of the Polynesian people
from their visit. They said that the sites are important for the understanding of the culture
and for the cultural preservation of the Polynesian people.

8.7.1 Recommendations

At the time of his initial interview with CSH, Mr. Becket recommended that Kamahimaua
School acquires the property in order to preserve the cultural features. On
October 2, 2010, he said the property had already been purchased.

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Kamanakaukealani Ahi, Wai'anae District, O'ahu

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Figure 31. Mr. Becket photographs a cultural feature, possibly an *ahu*, on Mrs. Causey’s Ranch in Kawaiola (CSH July 20, 2010)

Figure 32. Platform on Mrs. Causey’s Ranch. (CSH July 20, 2010); (Labeled “ukoa 1” in Figure 41)
Figure 33. Platform on Causey Property (Jan Becket July 20, 2010). (Labeled “ukoa 1” in Figure 41)

Figure 34. Second large cultural feature on Causey Ranch (CSH July 20, 2010) (Labeled “ukoa 2” in Figure 41)

Figure 35. Mr. Becket testing the sound of another possible bell stone on Causey Ranch (CSH July 20, 2010) (Located just below the site labeled “ukoa 1” in Figure 41)

Figure 36. Section of long wall on Causey Ranch (CSH July 20, 2010) (Located adjacent to the site labeled “Ukoa 1” in Figure 41)
Figure 37. Possible Ahu on Dean Ventura’s Property (CSH July 21, 2010) (Labeled “uku 5” in Figure 41)

Figure 38. Possible Bell Stone on Causey Property (CSH July 20, 2010) (Just below the site labeled “uku 4” in Figure 41)

Figure 39. Ahu at edge of amorphous alignment on Causey property (Jan Becket, September 2010) (Labeled “uku 6” in Figure 41)

Figure 40. (Jan Becket, September 2010) (labeled “uku7-ahu” in Figure 41)
8.8 David Orr

Mr. David Orr, originally from Pennsylvania, has lived in Pupukea on the North Shore since 1976 and has worked at Waimea Valley as the Botanical Collections Specialist since 1989. He is not familiar with any cultural history of the area but has in-depth knowledge of its flora. He describes the vegetation in the Kawailoa area generally as degraded coastal forest consisting mostly of weed trees such as *Terminalia catappa* (false kamani), *Leucaena leucocephala* (koa haole), *Aleurites moloccana* (*kukui*), and *Pluchea* sp. When asked if Ka'ena Point, which has been revegetated with native species, resembles the vegetation in the Project area and surrounding coastal area before it was degraded, he agreed. Mr. Orr visited the Project area and identified 13 taxa, two of which are (non-endemic) natives.

Table 4. Plants identified by Mr. Orr at the Project area

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Botanical Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach naupaka</td>
<td><em>Scaevola sericea</em></td>
</tr>
<tr>
<td>Pohinahina</td>
<td><em>Vitex rotundifolia</em></td>
</tr>
<tr>
<td>Guinea grass</td>
<td><em>Panicum maximum</em></td>
</tr>
<tr>
<td>Coconut</td>
<td><em>Cocos nucifera</em></td>
</tr>
<tr>
<td>Indian Daeabane</td>
<td><em>Pluchea indica</em></td>
</tr>
<tr>
<td>Milo</td>
<td><em>Thepesia populnea</em></td>
</tr>
<tr>
<td>Autograph tree</td>
<td><em>Chasea rosea</em></td>
</tr>
<tr>
<td>Norfolk Is. Pine</td>
<td><em>Aracanata heterophylla X A. columnaris</em></td>
</tr>
<tr>
<td>Christmas berry</td>
<td><em>Schinus terebinthifolius</em></td>
</tr>
<tr>
<td>Banyan</td>
<td><em>Ficus sp.</em></td>
</tr>
<tr>
<td>Kiawe</td>
<td><em>Prosopis pallida</em></td>
</tr>
<tr>
<td>Tree heliotrope</td>
<td><em>Tournefortia argentea</em></td>
</tr>
<tr>
<td>Sea Grape</td>
<td><em>Coccoloba uvifera</em></td>
</tr>
</tbody>
</table>

The native species are beach naupaka (*Scaevola sericea*), which he describes as “ubiquitous,” and pohinahina (*Vitex rotundifolia*), which he describes as “really nice stands of this blue-flowered native on the undisturbed beach.” Another native species in the area, but not in the Project area, is the endangered `ia`i `ia` (Hawaiian common moorhen, *Gallinula chloropus sandvicensis*). Mr. Orr has seen it in Kawailoa (near the transfer station), in the James Campbell Reserve (near Kahuku), and of course in Waima Valley, where they are protected and even reproducing. Because they are freshwater birds, they are found inland, not on the beach, but they are in the vicinity of the Project area. He explained that although some say there may only be 500 in the world, he has heard of an increased number of sightings lately.

Mr. Orr has no comments, concerns, or recommendations for the Project.

8.9 Michael Lyons

Mr. Michael Lyons was born 60 years ago and moved from the mainland to Hale'iwa when he was fourteen years old. He graduated from Waialua High School, attended Brigham Young University and Leeward Community College. He was a police officer for 31 and a half years and now leads the North Shore Neighborhood Board. Mr. Lyons says that currently, the Project area is used for recreation, snorkeling, fishing, snorkeling, etcetera. He voices the following concerns about the Project:

1. Design—How long will the cabins be? What will they be built of? Will they be wood, cement, metal? Will they be raised on foundation? It should have a non-institutional feel and convey warmth and openness.
2. Environmental—Where will the effluent go? How will it be disposed of? He would not like to see the ocean area disturbed or commercialized.
3. Management—Will there be security or protection at the site 24 hours, seven days a week? Will it be fenced? If so, the barrier should be culturally aesthetic (i.e., no chain link fence, use rock or wood or tile).
4. Cultural—The Project design and programs should respect the local culture and ensure local people have access and not have to pay to use it. The need and demand for people who want to attend Kamehameha Schools exceeds the opportunities; therefore, this learning center should be open to locals even if they are not Kamehameha Schools students.
Section 9  Cultural Landscape

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

The Cultural Landscape Map (Figure 41) shows the features that are significant with respect to the Project area. These are ancient, contemporary, archaeological, and natural cultural features. The Project area is situated in an area densely populated by archaeological features that signal the ancient activity of the kahana nei and kahi‘ona. Some of these sites are well documented, such as Kupopolo Heiau, Keahuokapua, and Pu‘u o Mahuka Heiau (McAllister 1933; Sterling and Summers 1978). Others are less known and not documented, such as the fishing shrine and the complexes on Mrs. Causey’s property.

In contemporary times, the Project area and surroundings are used for recreational activities, especially fishing. The site of the Souza Ohana beach houses are an example of such activity in recent past decades, and the area continues to be valued for marine recreation and fishing. When visiting the Project site in July and August, CHS observed: 1) two free divers fishing for he‘e and reef fish adjacent to the Project area (on the West side), 2) two kayaks paddling to the Wānapanapa islets, 3) one fisherman using a pole from shore, and 4) three fishermen carrying nets as they walked along the rocks on the shore of the Project area. One of these men faced the Project area and performed a Hawaiian chant, likely the protocol for fishing. After the chant, the fishermen began tossing their nets. Clearly, the Project area and immediate environs are in an area that is both rich with living Hawaiian culture as well as dense with archaeological features.
9.3.1 Lokoea Fishpond

Lokoea Fishpond, located by freshwater springs, is an important natural resource located in the Project area. It is located on the west side of Waimea Bay. Lokoea Fishpond is a traditional fishing site and has been used for fishing purposes for centuries. The fish pond is a shallow body of water that serves as a fish nursery for various species.

In prehistoric times, this area was part of a fishing village, or a kuleana, where food and other resources were harvested from the surrounding environment. The fish pond is a significant cultural resource that has been used by the local community for centuries. The fish pond is also an important place for cultural and spiritual practices.

9.3.2 Heiau

Heiau, which means ‘hill of worship’, is a traditional Hawaiian temple that was built on a rocky point. The heiau is associated with ancient Hawaiian beliefs and practices. The heiau was used for religious ceremonies and offerings to the gods. It was also used as a place of refuge and safety for the community.

The heiau is a significant cultural resource that has been preserved for centuries. It is an important place for cultural and spiritual practices. The heiau is also a symbol of the ancient Hawaiian culture and its connection to the natural environment.

9.4 Plant Resources

The Project area and environs have been sources of plants that are valuable resources for food, medicine, and other uses. Most community participants focus on the traditional values of plants, such as taro, sweet potatoes, and bananas.

The collection and utilization of plants in the Project area have been an important part of the local community's way of life. The use of plants as food, medicine, and other resources has been a crucial part of the local culture and traditions.

9.5 Marine and Freshwater Resources

In prehistoric times, the Project area was part of a fishing village, or a kuleana, where food and other resources were harvested from the surrounding environment. The fish pond is a shallow body of water that serves as a fish nursery for various species.

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In prehistoric times, this area was part of a fishing village, or a kuleana, where food and other resources were harvested from the surrounding environment. The fish pond is a shallow body of water that serves as a fish nursery for various species.
Background research for this Project yielded the following results:

1. In pre-Contact and early historic times, the Project area as part of a fishing village, or a scattering of small fishing villages, extending from the west side of Waimanalo Bay back toward Waiahole. The area along the coast today is the northernmost extent of Waimanalo Beach Project area. Project area has been home to fishing activities since ancient times and today is devoted to commercial and small-scale fishing. Beach characteristics, cultural and historical information indicate that the area was a site of significant historical and cultural importance.

2. The Project area is uniquely situated in close proximity to four significant religious sites: Woodburning Temple (Kekaha Kai), a large ai (temple, Kekaha Kai), a site marking the ahupua’a (land division) from the mountains to the sea; the boundaries between Waimanalo and Kamehameha, and Kupolopo, a tongue-shaped stone marking the south boundary of Kupolopo, which is associated with Ka’opulupulu, a temple complex.

3. Previous archaeological surveys and mapping by the Bishop Museum place three historic properties near the current Project area: a complex of stone fishponds, a large ai (temple) at Kekaha Kai, and a segment of OR&L railroad (Bath and Shon 1982). The results of an associated midden deposit containing indigenous Hawaiian artifacts, a complex of stone fishponds, and a segment of OR&L railroad (Bath and Shon 1982) are uncertain of the name to draw out the head of the boil. Mr. Orr provides an ecological perspective to plants in the Project area, noting the native species are beach foliage and the project area is home to a variety of bird life.

4. Human remains were discovered near the current Project area in 2002. The remains contained human bones, including a skull, a rib, and a femur, along with a variety of tools and artifacts. The remains were associated with the construction of a road in the area, and it is believed that the remains may have been left over from an earlier habitation site.

5. The results of an associated midden deposit containing indigenous Hawaiian artifacts, a complex of stone fishponds, and a segment of OR&L railroad (Bath and Shon 1982) are uncertain of the name to draw out the head of the boil. Mr. Orr provides an ecological perspective to plants in the Project area, noting the native species are beach foliage and the project area is home to a variety of bird life.

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10.2 Results of Community Consultation

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was anomalous or whether burial in terrigenous soils was a pattern where some sand castles and beach features were not available. There is no evidence that burial in such areas remains within the Project area.

5. Beginning in the early 1880s, the sandalwood trade initiated economic and cultural transformations in Waialua. The demand for sandalwood caused many fish and birds to become extinct. As the sandalwood trade collapsed, many of the local people moved away, leaving behind a rich history of cultural practices that continue to this day.

6. During the Middle Ages, Waialua was awarded the title of Hawaiian land (kupou). The demands put on the people of the area by the sandalwood trade caused many taro fields to become fallow. As the sandalwood trade collapsed, many of the local people moved away, leaving behind a rich history of cultural practices that continue to this day.

7. C.A. documentation indicates a wide range of indigenous Hawaiian subsistence activities being practiced in the vicinity of the Project area. The kahuku (Native Hawaiian land) was used for different purposes, including agriculture, fishing, and hunting. Echidna (Vaihe, Chinaman's Hat) was a meeting place for the collection of kahuku (paper mulberry) and kahuku (paper mulberry).

8. The Ohau Railway reached Waialua in 1898. The demand for sandalwood caused many taro fields to become fallow. As the sandalwood trade collapsed, many of the local people moved away, leaving behind a rich history of cultural practices that continue to this day.

9. Previously recorded oral histories depict the changing composition of Waialua with the advent of the sandalwood trade. The demand for sandalwood caused many taro fields to become fallow. As the sandalwood trade collapsed, many of the local people moved away, leaving behind a rich history of cultural practices that continue to this day.
3. Mr. Helemano notes that although healing plants were likely gathered in the area, and the past, most of them have been destroyed. Mrs. Causey and her siblings collected seeds to eat and for their family’s cooking. The plants were used as a natural medicine for the family. Mrs. Cannon recommends incorporating an educational aspect to the Fishpond, too. Ms. Cannon mentions the importance of local knowledge and ancestral practices in the area. She recalls the traditional planting and harvesting of medicinal plants, such as hala (canoe palm) and naupaka (hibiscus). These plants were used for various purposes, including medicine, food, and dyeing. Ms. Cannon describes the importance of traditional knowledge in preserving these plants.

4. Kamala’s mother, Kahakuloa (Haleiwa Moonstone), which is rare but still found in freshwater areas in Haleiwa (Common Hawaiian Moonstone), which is rare but still found in freshwater areas in Haleiwa. Mrs. Causey remembers how she and her siblings collected seeds for their family’s cooking. She also recalls how she and her other neighbors got to the rail on its last trip before the railroad was built over the property. Mrs. Causey remembers seeing these seeds along the rail. Ms. Cannon mentions the importance of local knowledge and ancestral practices in the area. She recalls the traditional planting and harvesting of medicinal plants, such as hala (canoe palm) and naupaka (hibiscus). These plants were used for various purposes, including medicine, food, and dyeing. Ms. Cannon describes the importance of traditional knowledge in preserving these plants.

5. The Project area and environs are sources of plants that are valuable resources for food, medicine, and culture. Ms. Cannon recommends incorporating an educational aspect to the Fishpond, too. Ms. Cannon mentions the importance of local knowledge and ancestral practices in the area. She recalls the traditional planting and harvesting of medicinal plants, such as hala (canoe palm) and naupaka (hibiscus). These plants were used for various purposes, including medicine, food, and dyeing. Ms. Cannon describes the importance of traditional knowledge in preserving these plants.

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When staffing the Learning Center, Mrs. Causey suggests “consider[ing] local people, instead of hiring from the mainland.” Mrs. Awai-Lennox recommends KS restore the use of the old Hawaiian place names in the area. Thinking of the larger context for the Project area, Mr. Becket initially recommended that Kamehameha Schools acquire the Holt property in order to preserve the complex of pre-Contact features. When CSH spoke with Mr. Becket on October 2, 2010, he said the property had already been purchased.

### 10.3 Impacts and Recommendations

Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, CSH foresees potential impacts of the proposed Project on Native Hawaiian or other ethnic groups’ cultural practices customarily and traditionally exercised for subsistence, cultural or religious purposes, and on cultural, historic, and natural resources. To avoid these potential impacts, CSH recommends:

1. Land-disturbing activities may uncover burials or other cultural resources. Previous archaeological surveys and mapping by the Bishop Museum place three historic properties within the current Project area and numerous archaeological sites and artifacts along the northeastern border of the Project area (Athens and Shun 1982; Welch 1981). The results of the accompanying AIS indicate two historic properties in the Project area and one historic property just outside the Project area with the high likelihood of subsurface cultural layers and/or structural remains in the Project area (Tulchin and Hammatt 2011). Human remains were discovered southwest of the Project area (Bath 1988). In addition, community consultation indicates that post-Contact artifacts may be located in the Project area. Should historic, cultural or burial sites or artifacts be identified during ground disturbance, all work should immediately cease and the appropriate agencies notified pursuant to applicable law.

2. Native Hawaiians and others practice their cultural activities (e.g., shore and reef fishing, marine recreation) in and near the Project area and immediate vicinity. Kamehameha Schools should implement best management practices to allow continued access to the shoreline for these and other cultural activities. Kamehameha Schools should brief and consult local community members and organizations as the Project design progresses. Consultation will keep the community informed of any changes that could result in unanticipated adverse cultural impacts.

### Section 11 References Cited

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Title</th>
<th>Year</th>
<th>Publisher/Publisher Location</th>
</tr>
</thead>
<tbody>
<tr>
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<td>1988</td>
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</tr>
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</tr>
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</tr>
<tr>
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</tr>
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</tr>
</tbody>
</table>
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Hawaii Department of Land and Natural Resource.

Hawaii`TMK Service

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Waihona ‘Aina Corporation

Welch, David

Whitman, John B.
Appendix A  Glossary

To highlight the various and complex meanings of Hawaiian words, the complete translations from Pukui and Elbert (1986) are used unless otherwise noted. In some cases, alternate translations may resonate stronger with Hawaiians today; these are placed prior to the Pukui and Elbert (1986) translations and marked with “(common).”

Diacritical markings used in the Hawaiian words are the ‘okina and the kahakō. The ‘okina, or glottal stop, is only found between two vowels or at the beginning of a word that starts with a vowel. A break in speech is created between the sounds of the two vowels. The pronunciation of the ‘okina is similar to saying “oh-oh.” The ‘okina is written as a backwards apostrophe. The kahakō is only found above a vowel. It stresses or elongates a vowel sound from one beat to two beats. The kahakō is written as a line above a vowel.

<table>
<thead>
<tr>
<th>Hawaiian Word</th>
<th>English Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>āholaʻehole</td>
<td>Juvenile Hawaiian flagtail.</td>
</tr>
<tr>
<td>ahu</td>
<td>Heap, pile, collection, mound, mass; altar, shrine, cairn.</td>
</tr>
<tr>
<td>'ahu</td>
<td>Land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap ('ahu) of stones surmounted by an image of a pig ('ahu 'a), or because a pig or other tribute was laid on the altar as tax to the chief.</td>
</tr>
<tr>
<td>akakoa</td>
<td>(common) Reed.</td>
</tr>
<tr>
<td>ahu</td>
<td>God, goddess, spirit, ghost, devil, image, idol, corpse.</td>
</tr>
<tr>
<td>ahi</td>
<td>Big-eyed scad (fish).</td>
</tr>
<tr>
<td>ali'i</td>
<td>Chief, chiefess, officer, ruler, monarch, peer, headman, noble, aristocrat, king, queen, commander.</td>
</tr>
<tr>
<td>'āpona</td>
<td>Piece, slice, portion, fragment, section, segment, installment, part, land parcel, lot, district, sector, ward, precinct.</td>
</tr>
<tr>
<td>'aumakua</td>
<td>Family of personal gods, deified ancestors who might assume the shape of sharks, owls, hawks (etc...). A symbiotic relationship existed; mortals did not harm or eat 'aumakua, and 'aumakua warned and reprimanded mortals in dreams, visions, and calls. 'Aumākua—plural of 'aumakua.</td>
</tr>
<tr>
<td>awa</td>
<td>Kava (Piper methysticum).</td>
</tr>
<tr>
<td>hau</td>
<td>A lowland tree (Hibiscus tiliae).</td>
</tr>
<tr>
<td>hula</td>
<td>Pandanus or screw pine (Pandanus odorattissimus).</td>
</tr>
<tr>
<td>hōllo</td>
<td>Pre-Christian place of worship, shrine; some hōllo were elaborately constructed stone platforms, others simple earth terraces. Many are preserved today.</td>
</tr>
<tr>
<td>ʻili</td>
<td>Land section, next in importance to an ahupua'a and usually a subdivision of an ahupua'a.</td>
</tr>
<tr>
<td>ʻilina</td>
<td>Grave, tomb, sepulcher, cemetery, mausoleum, plot in a cemetery.</td>
</tr>
<tr>
<td>ʻiwi kiʻipuna</td>
<td>Ancestral bone remains (common).</td>
</tr>
<tr>
<td>kahuna</td>
<td>Priest, sorcerer, magician, wizard, minister, expert in any profession. Kāhuna—plural of kahuna.</td>
</tr>
<tr>
<td>kahuna nui</td>
<td>Supreme spiritual leader (common). High priest and counselor to a high chief.</td>
</tr>
<tr>
<td>kōma 'āina</td>
<td>Native-born, one born in a place, host; native plant; acquainted, familiar, Lit., land child.</td>
</tr>
<tr>
<td>ʻino lae</td>
<td>Many forms taken by a supernatural body, as Pele, who could at will become a flame of fire, a young girl, or an old hag.</td>
</tr>
<tr>
<td>ko'a</td>
<td>Shrine, often consisting of circular piles of coral or stone, built along the shore or by ponds or streams, used in ceremonies as to make fish multiply.</td>
</tr>
<tr>
<td>kula</td>
<td>Plain, field, open country, pasture. An act of 1884 distinguished dry or kula land from wet or taro land.</td>
</tr>
<tr>
<td>kuleana</td>
<td>Native Hawaiian land rights (common). Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province.</td>
</tr>
<tr>
<td>kūni</td>
<td>Sorcery (common).</td>
</tr>
<tr>
<td>kupuna</td>
<td>Elders (common). Grandparent, ancestor, relative or close friend of the grandparent's generation, grandaunt, granduncle. Kūpuna—plural of kupuna.</td>
</tr>
<tr>
<td>kiʻulua</td>
<td>Any stone god used to attract fish, whether tiny or enormous, carved or natural, named for the god of fishermen; heiau near the sea for worship of fish gods; but when fish gear was kept with kiʻulua images so that gear might be impregnated with kiʻulua mana, usually inland and very taboo.</td>
</tr>
<tr>
<td>koʻi</td>
<td>Irrigated terrace, especially for taro, but also for rice; paddy.</td>
</tr>
<tr>
<td>Hawaiian Word</td>
<td>English Translation</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>luakini</td>
<td>Large heiau where ruling chiefs prayed and human sacrifices were offered.</td>
</tr>
<tr>
<td>maka'ākāna</td>
<td>Commoners.</td>
</tr>
<tr>
<td>makai</td>
<td>Seaward.</td>
</tr>
<tr>
<td>mai'a</td>
<td>All kinds of bananas and plantains.</td>
</tr>
<tr>
<td>ma'auka</td>
<td>Inland.</td>
</tr>
<tr>
<td>moku</td>
<td>District, island, islet, section.</td>
</tr>
<tr>
<td>mo'olelo</td>
<td>Story, tale, myth, history, tradition, literature, legend, journal, log, yarn, fable, essay, chronicle, record, article; minutes, as of a meeting. (From mo'o ʻōlelo, succession of talk; all stories were oral, not written).</td>
</tr>
<tr>
<td>niho</td>
<td>Tooth.</td>
</tr>
<tr>
<td>okazu (Japanese)</td>
<td>Side dish</td>
</tr>
<tr>
<td>ʻōlelo no'eaʻu</td>
<td>Proverb, wise saying, traditional saying.</td>
</tr>
<tr>
<td>oli</td>
<td>Chant that was not danced to, especially with prolonged phrases chanted in one breath, often with a trill at the end of each phrase; to chant thus.</td>
</tr>
<tr>
<td>ʻohana</td>
<td>Family.</td>
</tr>
<tr>
<td>pa'i pa'i</td>
<td>To slap.</td>
</tr>
<tr>
<td>pa'i'ai</td>
<td>Hard, pounded but undiluted taro</td>
</tr>
<tr>
<td>pā'ina</td>
<td>Small party with dinner</td>
</tr>
<tr>
<td>pali</td>
<td>Cliff, precipice, steep hill or slope.</td>
</tr>
<tr>
<td>pāpūlo</td>
<td>Juvenile jack (fish)</td>
</tr>
<tr>
<td>pūnīwai</td>
<td>Water spring.</td>
</tr>
<tr>
<td>tako (Japanese)</td>
<td>Octopus (may also mean squid in Hawaiian context)</td>
</tr>
<tr>
<td>ʻula</td>
<td>Sweet potato (Ipomoea batatas)</td>
</tr>
<tr>
<td>ʻukiʻuki</td>
<td>Native member of lilly family (Dianella sandwicensis)</td>
</tr>
<tr>
<td>ʻulu maika</td>
<td>Stone used in maika [bowling] game.</td>
</tr>
<tr>
<td>wahi pana</td>
<td>Storied place (common). Legendary place.</td>
</tr>
<tr>
<td>wahine moo</td>
<td>Mermaid (common). Female water spirit or reptile.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hawaiian Word</th>
<th>English Translation</th>
</tr>
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<tbody>
<tr>
<td>wauke</td>
<td>Paper mulberry (<em>Broussonetia papyrifera</em>).</td>
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## Appendix B  Common and Scientific Names for Plants and Animals Mentioned by Community Participants

<table>
<thead>
<tr>
<th>Common Names</th>
<th>Possible Scientific Names</th>
<th>Source</th>
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<tbody>
<tr>
<td>Hawaiian</td>
<td>Other</td>
<td>Genus</td>
</tr>
<tr>
<td>'a'ama</td>
<td>black crab</td>
<td>Grapsus</td>
</tr>
<tr>
<td>akule</td>
<td>big-eyed scad</td>
<td>Sedar</td>
</tr>
<tr>
<td>alae'ula</td>
<td>Hawaiian common moorhen</td>
<td>Galildia</td>
</tr>
<tr>
<td>ama'ama</td>
<td>striped mullet</td>
<td>Mugil</td>
</tr>
<tr>
<td>awa</td>
<td>milkfish</td>
<td>Chanos</td>
</tr>
<tr>
<td>awa</td>
<td>kava</td>
<td>Piper</td>
</tr>
<tr>
<td>ñweoweo</td>
<td>bigeye</td>
<td>Heteropriacanthus</td>
</tr>
<tr>
<td>ñweoweo</td>
<td>bigeye</td>
<td>Priaacanthus</td>
</tr>
<tr>
<td>halo</td>
<td>Pandanæ</td>
<td>sp. *</td>
</tr>
<tr>
<td>haole koa</td>
<td>Leucaena</td>
<td>sp. *</td>
</tr>
<tr>
<td>hānū'u</td>
<td>Hawaiian black grouper</td>
<td>Epinephelus</td>
</tr>
<tr>
<td>hau</td>
<td>beach hibiscus</td>
<td>Hibiscus</td>
</tr>
<tr>
<td>ilima</td>
<td>Sida</td>
<td>folias</td>
</tr>
<tr>
<td>kala</td>
<td>surgeon fish</td>
<td>Naso</td>
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<td>kalo</td>
<td>taro</td>
<td>Colocasia</td>
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<td>kiawe</td>
<td>mesquite</td>
<td>Prospis</td>
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<tr>
<td>koi (Japanese)</td>
<td>carp</td>
<td>Cyprinus</td>
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<tr>
<td>kuku</td>
<td>candlenut</td>
<td>Aleurites</td>
</tr>
<tr>
<td>kūmū</td>
<td>goatfish</td>
<td>Parupenous</td>
</tr>
<tr>
<td>kūkana-o-ka-ki</td>
<td>mangrove</td>
<td>Bruguiera</td>
</tr>
<tr>
<td>limu 'ele'ele</td>
<td>seaweed, algae</td>
<td>Entermorpha</td>
</tr>
<tr>
<td>limu lipoa</td>
<td>seaweed, algae</td>
<td>Dictyopteris</td>
</tr>
<tr>
<td>limu he'e</td>
<td>seaweed, algae to eat with octopus</td>
<td>unknown</td>
</tr>
<tr>
<td>limu kohu</td>
<td>seaweed, algae</td>
<td>Asparagopsis</td>
</tr>
<tr>
<td>limu wānac'ole **</td>
<td>seaweed, algae</td>
<td>Codium</td>
</tr>
<tr>
<td>manini</td>
<td>convict tang</td>
<td>Acanthurus</td>
</tr>
<tr>
<td>naupaka</td>
<td>beach naupaka</td>
<td>Scaevola</td>
</tr>
<tr>
<td>nenue</td>
<td>chub fish</td>
<td>Kyphosus</td>
</tr>
<tr>
<td>'ōama</td>
<td>goatfish under 7 inches long</td>
<td>Mulliodon</td>
</tr>
<tr>
<td>'ōla</td>
<td>bonefish</td>
<td>Albula</td>
</tr>
<tr>
<td>ogo (Japanese)</td>
<td>seaweed</td>
<td>Gracili-ria</td>
</tr>
<tr>
<td>ʻopihi</td>
<td>limpet</td>
<td>Cellana</td>
</tr>
</tbody>
</table>

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Cultural Impact Assessment for the Kaunolu School/Kàpādholo Cultural Learning Project, Kawaalilo (Kapalolo) Ahupua'a, Waimalu District, Oahu
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Cultural Impact Assessment for the Kaunolu School/Kàpādholo Cultural Learning Project, Kawaalilo (Kapalolo) Ahupua'a, Waimalu District, Oahu
TMK: (1) 6-1-003; par. 036
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<thead>
<tr>
<th>Common Names</th>
<th>Possible Scientific Names</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>pīpio</strong></td>
<td>juvenile big eye jack</td>
<td>Hoover 2003</td>
</tr>
<tr>
<td><strong>pipi</strong> (or pipipi)</td>
<td>pearl oysters</td>
<td>Pukui and Elbert 1986</td>
</tr>
<tr>
<td><strong>poʻoraha</strong>na</td>
<td>beach vitex</td>
<td>D. Orr, personal communication 2010</td>
</tr>
<tr>
<td><strong>tī</strong></td>
<td>Cordyline fruticosa</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>ʻula</strong></td>
<td>sweet potato</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>ʻiʻi o ke haʻiʻi keʻakeʻake</strong></td>
<td>armored sea urchin</td>
<td>Pukui and Elbert 1986</td>
</tr>
<tr>
<td><strong>wana</strong></td>
<td>spiny sea urchin</td>
<td>Pukui and Elbert 1986</td>
</tr>
<tr>
<td><strong>wana</strong></td>
<td>spiny sea urchin</td>
<td>Pukui and Elbert 1986</td>
</tr>
<tr>
<td><strong>banana</strong></td>
<td>Musa spp.*</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>barracuda</strong></td>
<td>Sphyraena spp.*</td>
<td>Hoover 1993</td>
</tr>
<tr>
<td><strong>breadfruit</strong></td>
<td>Artocarpus abelila</td>
<td>Imada et al. 2005</td>
</tr>
<tr>
<td><strong>date</strong></td>
<td>Phoenix dactylifera</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>guava</strong></td>
<td>Psidium guajava</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>mango</strong></td>
<td>Mangifera indica</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>mountain apple</strong></td>
<td>Syzygium maclehense</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>mullet</strong></td>
<td>Mugil cephalus</td>
<td>Hoover 1993</td>
</tr>
<tr>
<td><strong>passion fruit</strong></td>
<td>Passiflora edulis</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>plover</strong></td>
<td>Pluvialis fulva</td>
<td>Hawaii DLNR 2005</td>
</tr>
<tr>
<td><strong>plum</strong></td>
<td>Prunus spp.*</td>
<td>Wagner et al. 1999</td>
</tr>
<tr>
<td><strong>sugar cane</strong></td>
<td>Saccharum spp.*</td>
<td>Wagner et al. 1999</td>
</tr>
</tbody>
</table>

*spp. = multiple species
**Corrected Hawaiian spelling by Pukui and Elbert 1986
Appendix C  Authorization and Release Form

Cultural Surveys Hawai‘i

AUTHORIZATION AND RELEASE FORM

Cultural Surveys Hawai‘i (CSH) appreciates the generosity of the University of Hawai‘i who are using their knowledge and expertise in the field of cultural and historic properties, and experiences of past and present cultural practices for the Cultural Impact Assessment for the Learning Project.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our study. Here are the procedures we promise to follow:

1. The interview will not be tape-recorded without your knowledge and explicit permission.
2. If recorded, you will have the opportunity to review the written transcript of our interview with you. At that time you may make any additions, deletions or corrections you wish.
3. If recorded, you will be given a copy of the interview notes for your record.
4. You will be given a copy of this release form for your record.
5. You will be given any photographs taken of you during the interview.

For their protection, we need your written confirmation that:

1. You consent to the use of the complete transcript and/or interview quotes for reports on cultural sites and practices, historic documentation, and/or academic purposes.
2. You have reviewed the interview notes, in a format available to the public.
3. If a photograph is taken during the interview, you consent to the photograph being included in any reports or publications generated by this cultural study.

I certify, agree to the procedures outlined above and, by my signature, give my consent and release for this interview to be used as specified.

Signature:

[Stamp]

[Cover] Cultural Impact Assessment for the Kamehameha Schools Kāpādau Cultural Learning Project, Kawaiahaʻo School Ahepuaʻa, Waikoloa District, Oʻahu

TMK: (1) 6-1-003: par. 456
Appendix D

Cultural Impact Assessment for the Kamehameha Schools Kāpūalua Cultural Learning Project, Kāwālōa (Kapalua) Ahe'apua'a, Wailuku District, O'ahu
TMK: (1) 6-1-003; por. 036

TMK: (1) 6-1-003; por. 036
Cultural Impact Assessment for the Kamehameha Schools Kāpākū Cultural Learning Project, Kawaiana (Kāpākū) Ahupua’a, Wai‘alae District, O‘ahu
TMK: (1) 6-1-003; pc: 056

Appendix D

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Sweet Potatoes: 4
Irish Potatoes: Other Edible: No
Bananas: Spring Well: No
Breadfruit: Pigmen: No
Coconut: Road/Path: No
Coffee: Burial/Graveyard: No
Oranges: Wall/Perimeter: Yes
Sugar Cane: Pali: Yes
Tobacco: Disease: No
Kiawe Trees: Claimant Died: No
Other Plants: Other Mammals: No Miscellaneous: No

No. 10248, Makiki, Kāpākū, Waialae, O‘ahu, Jan. 31, 1948
R.R. 522-523V

To the Land Commissioner, Respectful Greetings: I, Makiki, hereby state my claim for land and house lot, at Kāpākū. The land claim is at Kawaiana, bounded on the north by the sea, on the east by Kau‘u’s land, on the south by a stream, on the west by Wai‘alae’s house lot. The house lot claim is at Kāpākū, bounded on all sides by my land. My right of occupancy at that place was from the time of Kamehameha I until the present.

P.Y. 830v11
No. 10248, Makiki, Kāpākū, Waialae

Wai‘alae house, hoohio. Ua ike o i kona mau apana aina, Eka apana aina.

Apapa 1. 4 mala uala ma Kawaiana.
Apapa 2. Pa‘ahau o Kāpākū kai laaua.

Apapa 1: Makiki, pa‘aii
Westener, Kauai, Ma‘ui, Waialae

Apapa 2: Makiki, Ali‘i kau‘u
Westener, Kauai, Ma‘ui, Kāpākū, Pa‘ia

Wai‘alae house, hoohio. Hinow his two apana of land.

Apapa 1. 4 mala of sweet potatoes at Kawaiana

P.Y. 830v11 Translation
No. 10248, Makiki, at Kāpākū, Waialae

Wai‘alae house, hoohio. Hinow his two apana of land.

Apapa 1. 4 mala of sweet potatoes at Kawaiana

Apapa 2. House lot, named Kau‘u kula.

Apapa 3: Makiki, pa‘aii
Westener, Kauai, Waialae

We received these apapa from his parents from the time of Kamehameha I. They are unali‘i‘i. The makalii, awa, my knowledge of it is the same as Wai‘alae’s.

Claim Number: 10772
Claimant: Pelepele
Other claimant: Oahu
Other name: Oahu
Island: Waialae
District: Waialae
Ahu: Kawai, Kawai o ka ahu
Surface: PāGOA/GOA, KĀPAKAU

Apapa: 5
Awarded: 1
Lot: 10772
Area: 827.4
Shape: 838.11
Island: Oahu
House Lot: 7358
Kahua/Pahu: Number of Royal Patents: 1
Salt lands: Keahi/Pāhoa: No
Wai‘alae: 1
Liloa: No
Kāpākū: Liloa: No
Horu: Failing Rights: No
Ho‘ohe: Sea/Shore/Dunes: No
Sweet Potatoes: Other Edible: No
Irish Potatoes: Other Edible: No
Bananas: Spring Well: No
Breadfruit: Pigmen: No
Coconut: Road/Path: Yes
Coffee: Burial/Graveyard: No
Oranges: Wall/Perimeter: Yes
To the Land Commissioners,

Respectful Greetings to you. I, Pelaapea, hereby state my claim for land at Kapaaolu. The first is Kaholii, bounded on the north by a road, on the east also by a road, on the south by a path, on the west by the road. Another claim is Uhumela, bounded on the north and east by a road, on the south by a path, on the west by Pelaapea's land. Another claim is Hau, bounded on the north by a road, on the west by Nahale's land, on the south by a path, on the west by Mahiki's land. Furthermore, there are some halu clumps at Kaeue. Furthermore, there is a path, as at Kauwha aha, at Ponoahau. Bounded on the north by a path, on the west by Nahale's land, on the south by the stream, on the west by Waiwani's land. These are my properties, for the Government to award.

Pelaapea

T.M.K: (1) 6-1-003: por. 056

Cultural Impact Assessment for the Kamehameha Schools Kapaaia Cultural Learning Project,
Kapaaia (Kapaaia) Alapapa'a, Wailua District, Oahu
TMK: (1) 6-1-003: por. 036
Cultural Surveys Hawai'i Job Code: KAWAILOA 5

Appendix D

Cultural Impact Assessment for learning project,

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TMK: (1) 6-1-003: por. 056

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TMK: (1) 6-1-003: por. 056
Appendix E  Community Letter

At the request of Group 70 International, Inc., Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the Kamahamua Schools Kāpāpāloa Cultural Learning Project. Kāpāpāloa School is located in the Waialua District on O‘ahu Island (TML 16-1-003-027). The approximate 10-acre project area encompasses the Kāpāpāloa School and Kāpāpāloa Public Recreation Area. The purpose of this CIA is to evaluate potential impacts to cultural practices and resources. The purpose of this report is to evaluate potential impacts to cultural practices and resources as a result of the proposed development in Kāpāpāloa. The information presented is for planning and guidance. The purpose of this report is to evaluate potential impacts to cultural practices and resources as a result of the proposed development in Kāpāpāloa. The purpose of this report is to evaluate potential impacts to cultural practices and resources as a result of the proposed development in Kāpāpāloa.