Haleiwa Commercial Redevelopment

Haleiwa, Island of O'ahu

TMK: (1) 6-6-004:013, 14, 15,16, 17, 18, 19, 27, 28, and 32

Draft Environmental Assessment

KAMEHAMEHA SCHOOLS

GROUP 70 INTERNATIONAL

June 2011

Haleʻiwa Commercial Redevelopment

TMK: (1) 6-6-4:13, 14, 15, 16, 17, 18, 19, 27, 28, and 32
Haleʻiwa, Island of Oʻahu

Draft Environmental Assessment (DEA)

This environmental document is prepared in accordance with the requirements of Chapter 343, HRS and Hawaiʻi Administrative Rules, Title 11, Department of Health

Applicant:
Kamehameha Schools
567 S. King St, Honolulu, HI 96813

Accepting Agency:
City & County of Honolulu
Department of Planning and Permitting

Prepared by:

GROUP 70 INTERNATIONAL

Sustainable Development • Architecture • Planning & Environmental Services • Interior Design • Technology
Honolulu, Hawaiʻi

June 2011

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1.0
DESCRIPTION OF THE PROPOSED ACTION

1.0 DESCRIPTION OF THE PROPOSED ACTION

This Draft Environmental Assessment (DEA) has been prepared in accordance with the requirements of Chapter 343, Hawai'i Revised Statutes and Title 11, Chapter 200, Hawai'i Administrative Rules, Department of Health, State of Hawai'i. The proposed action involves consolidation and subdivision of parcels, change of zone from Residential District (R-5) to Neighborhood Business District (B-1), and from General Agricultural District (AG-2) to Country District. The project will include the preservation and refurbishment of selected historic structures, the demolition of deteriorated buildings, construction of commercial buildings and parking area, and installation of infrastructure to support the redevelopment.

1.1 PROJECT INFORMATION SUMMARY

Type of Document:	Draft Environmental Assessment (DEA)
Project Name:	Hale'iwa Commercial Redevelopment
Applicant:	Kamehameha Schools (KS) 567 S. King St, Honolulu, HI 96813
Accepting Agency:	City & County of Honolulu Department of Planning and Permitting (DPP) 650 S. King St, Honolulu, HI 96813
Ch. 343, HRS Trigger:	Use of Public Right of Way (State), Major Zone Change (County)
Project Location:	Kamehameha Highway from Mahaulu Lane to Kewalo Lane
Tax Map Key:	(1) 6-6-004:013-19, 27, 28, and 32
Fee Landowner:	Trustees of the Estate of Bernice Pauahi Bishop dba Kamehameha Schools
Land Area:	4.22 acres
State Land Use Designation:	Urban District
Sustainable Community Development Plan:	North Shore
Sustainable Community Development Plan Land Use Map:	Country Town
Zoning:	Neighborhood Business District (B-1), Residential District (R-5), and General Agricultural District (AG-2)
Flood Zone:	Zone X (outside 500-year floodplain)
Anticipated Determination:	Finding of No Significant Impact (FONSI)

1.2 OVERVIEW OF PROPOSED PROJECT

Kamehameha Schools (KS) is proposing to redevelop its commercial properties located in Hale'iwa along Kamehameha Highway from Mahaulu Lane to Kewalo Lane (see *Figure 1.1*). These properties include the popular Matsumoto and Aoki Shave Ice businesses. Refer to *Figure 1.2* for parcel maps.

The intent of this redevelopment project is to revitalize existing businesses and provide essential infrastructure, while retaining the rural scale and plantation character of the Hale'iwa Special District. The redevelopment will expand existing retail frontage with a combination of new in-line storefronts and preservation or reconstruction of selected historic structures (as defined in Hale'iwa Special District Ordinance). The project will also increase pedestrian walkways and safety, provide a central gathering place, improve area drainage, and improve traffic flow with a newly constructed rear parking lot. The existing properties support approximately 14,000 SF of Gross Leasable Area (GLA), while the final build-out of the proposed redevelopment will provide up to 30,000 SF of GLA.

The proposed project area is designated as "Urban" according to the State Land Use Commission's State of Hawai'i Land Use Classification (*Figure 1.3*). Land uses in urban areas are under respective counties' jurisdiction. The frontage of the project is currently zoned Residential District (R-5) and Neighborhood Business District (B-1) (*Figure 1.4*).

The residential zoning reflects historic land use of storeowners who lived on the site. The current and proposed commercial uses are nonconforming with the residential zoning. The proposed action, therefore, involves consolidation and subdivision of parcels and change of zone to bring the uses into conformance.

Parcels fronting Kamehameha Highway will require zone change from Residential District (R-5) to Neighborhood Business District (B-1). Parcels located behind the commercial frontage will require zone change from General Agricultural District (AG-2) to Country District to allow parking uses. *Figure 1.5* shows the proposed subdivision plan and the proposed change of zone.

As long term landholders, especially in the community of the North Shore, KS values the importance to incorporate "green" and Leadership in Energy and Environmental Design (LEED) construction elements. Implementation of sustainable design elements will be determined based on feasibility of the project. In addition to these elements, KS will evaluate the potential of incorporating renewable energy (e.g. solar hot water, photovoltaics), recycled wastewater and energy efficient design.

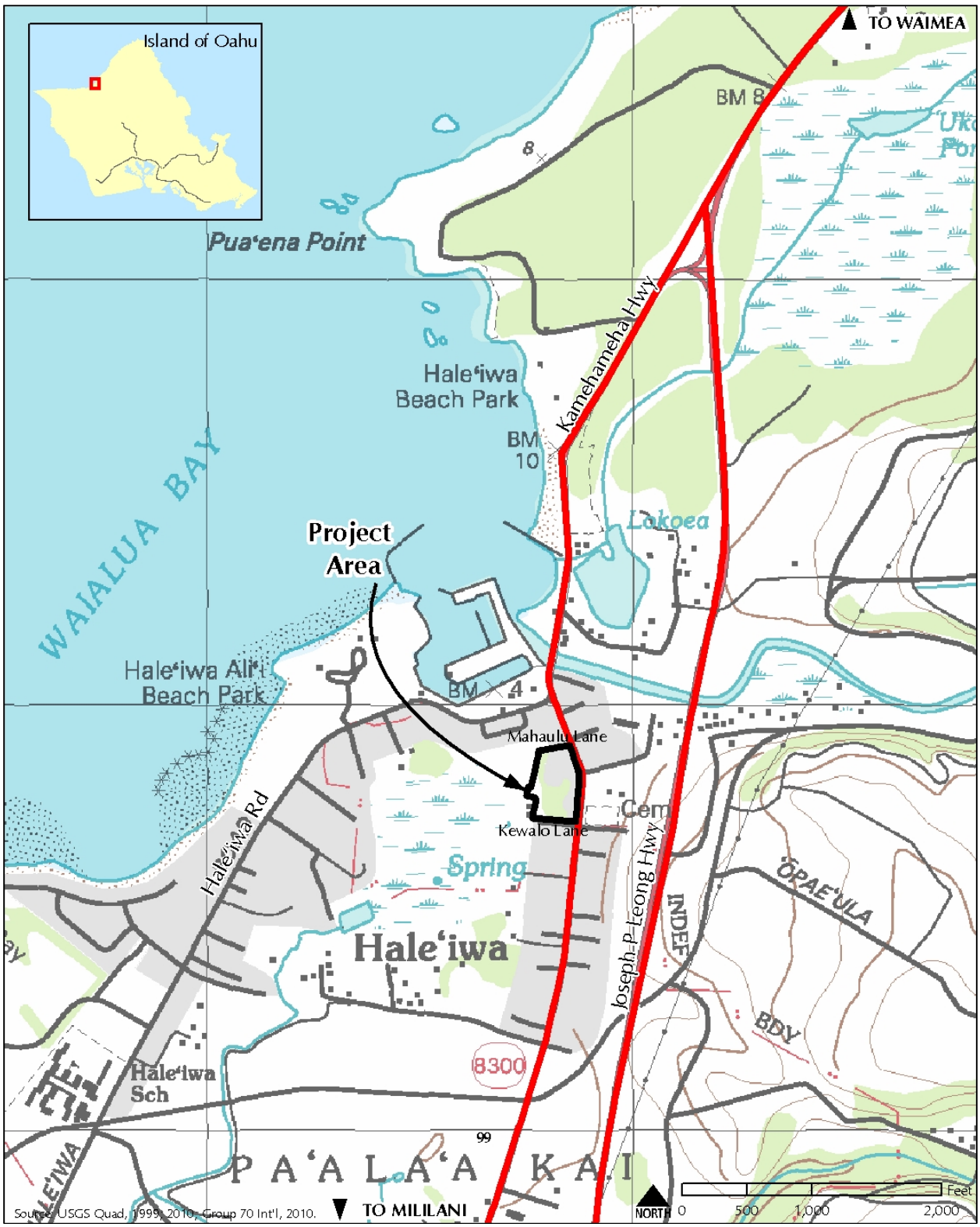


Figure 1.1 Project Location Map

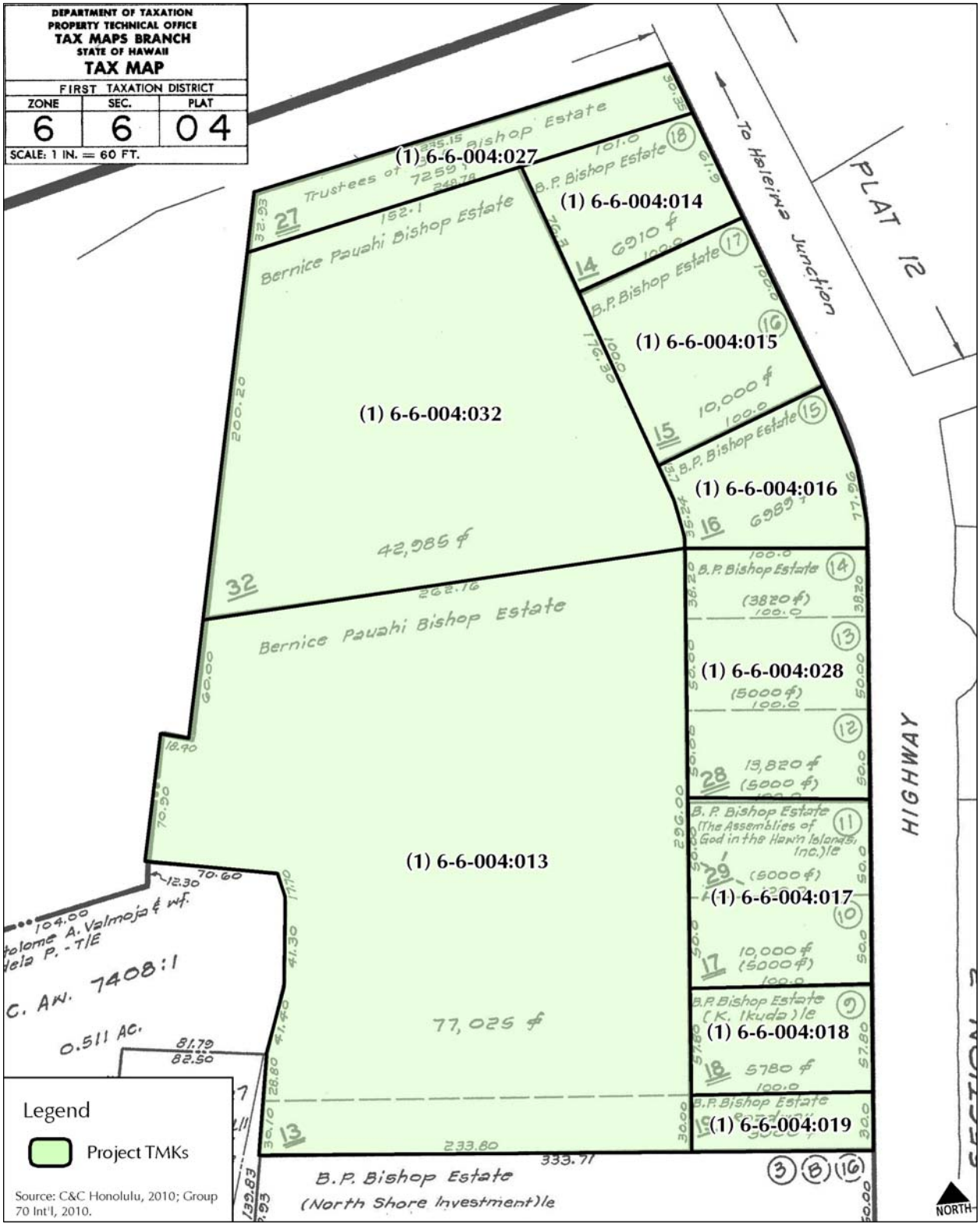


Figure 1.2 Tax Map Keys Map

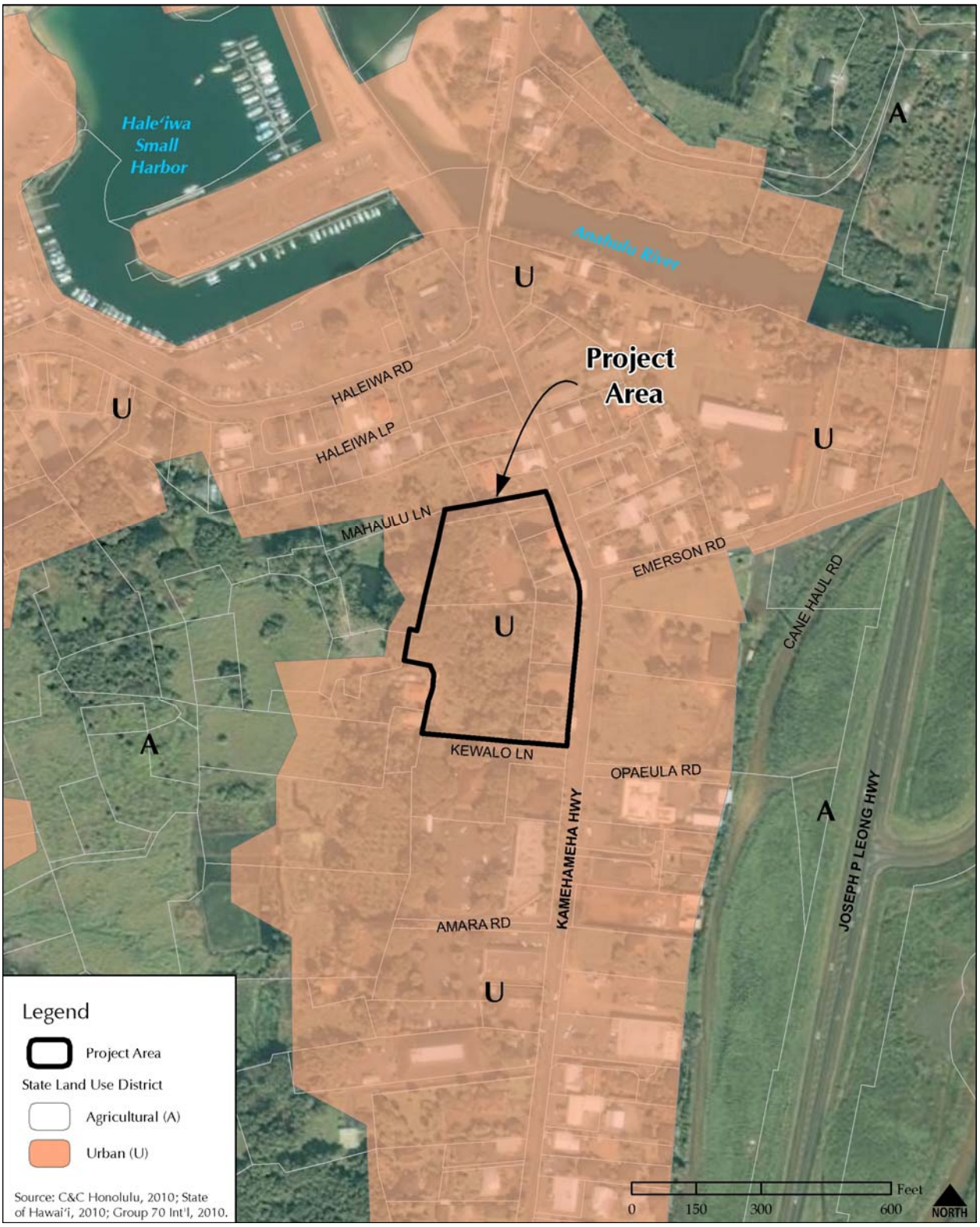


Figure 1.3 State Land Use Map

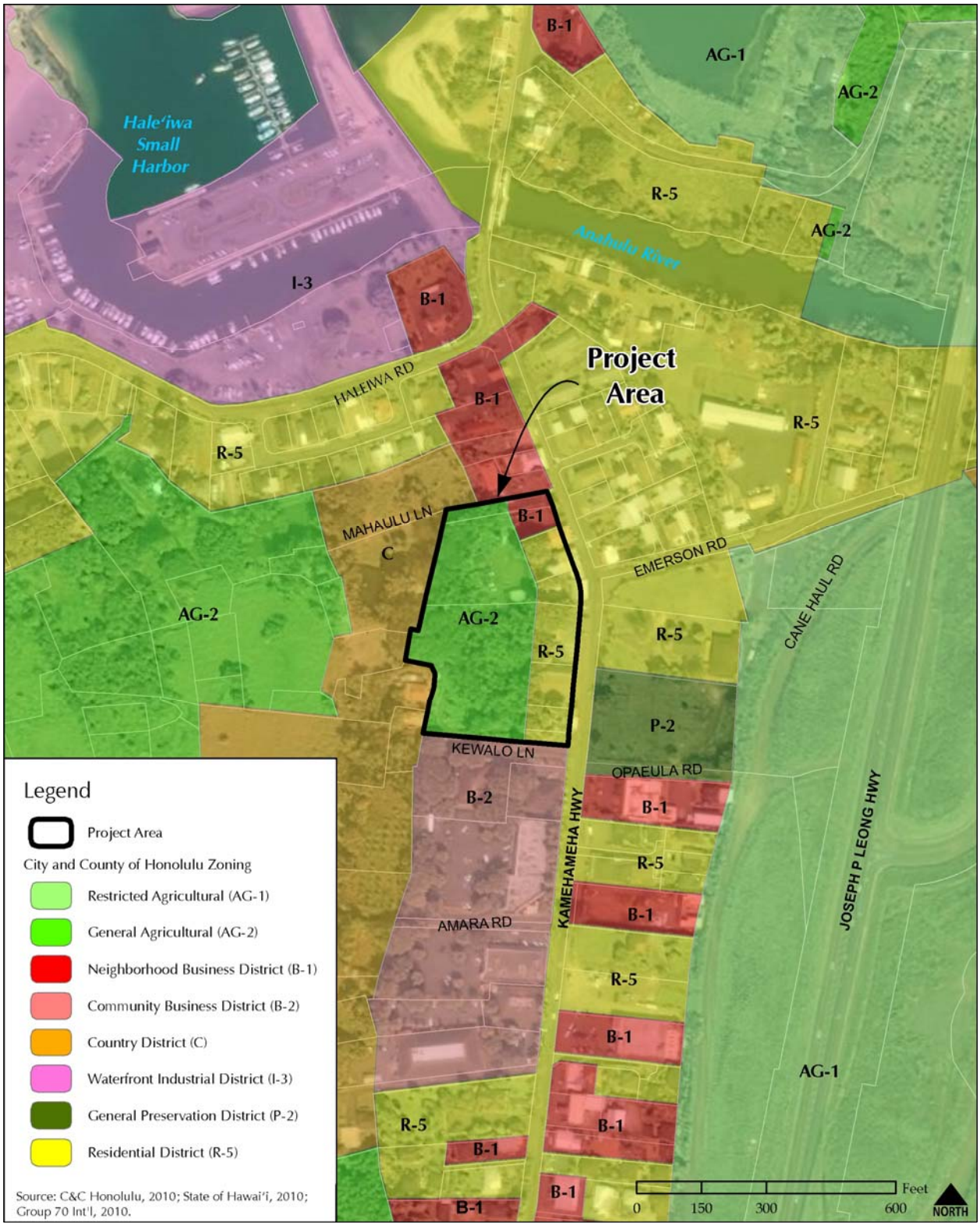
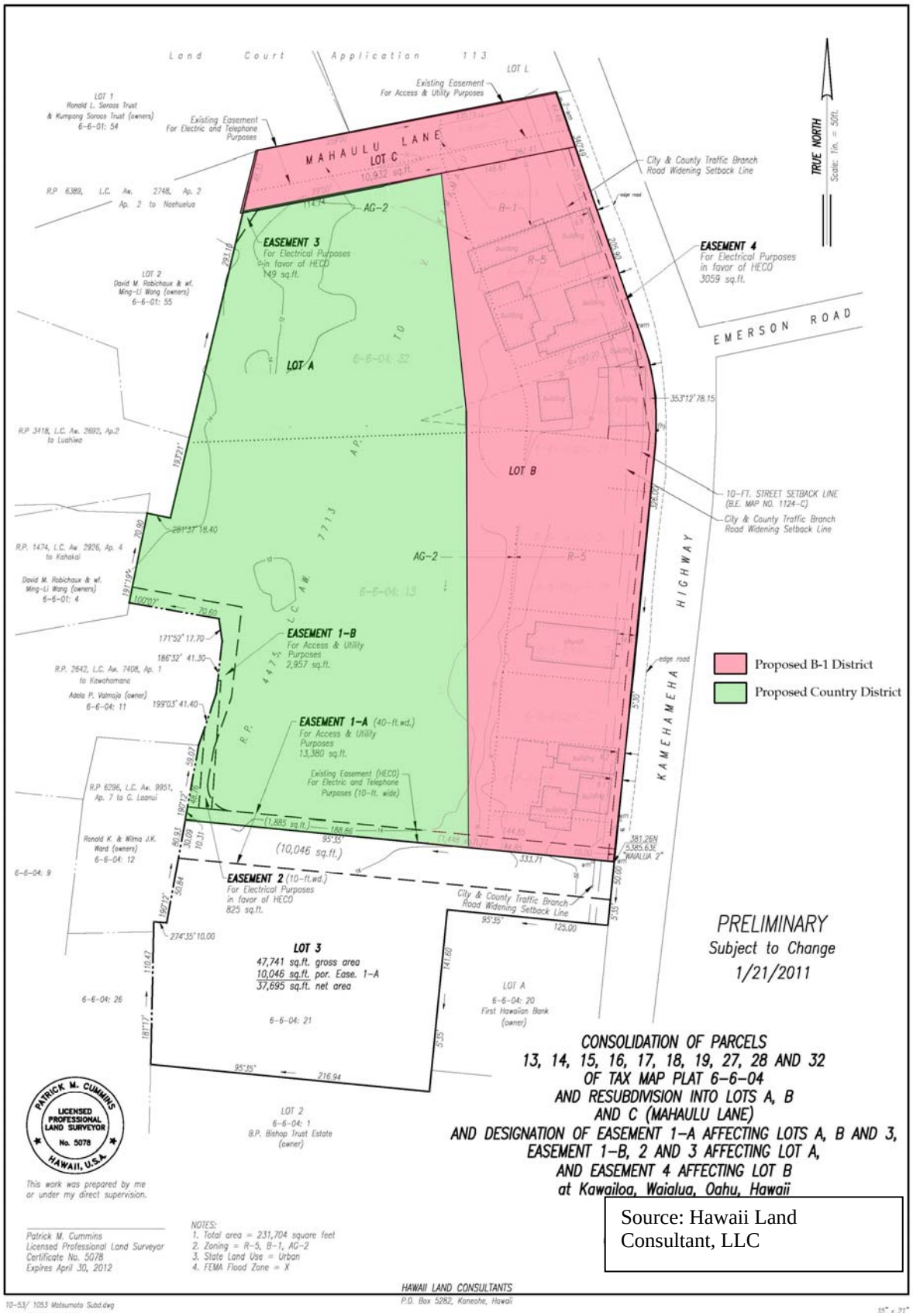


Figure 1.4 Current City and County of Honolulu Zoning Map



Source: Hawaii Land Consultant, LLC

Figure 1.5 Preliminary Subdivision Plan and Proposed Change of Zone (subject to change)

1.3 PURPOSE OF THE PROJECT

The purpose of the proposed redevelopment is to fulfill KS's strategic plan and implement KS North Shore Master Plan.

The KS Strategic Plan 2000-2015 ("Strategic Plan") was completed in September 2000 and includes seven of goals and priorities. This project addresses Goals 5 & 6 of the Strategic Plan.

Goal 5: KS will optimize the value and use of current financial and non-financial resources and actively seek and develop new resources.

Goal 6: KS will malama i ka'aina: practice ethical, prudent and culturally appropriate stewardship of lands and resources.

The proposed redevelopment will bolster the KS mission by generating greater financial yields on its asset value than is currently realized. These additional revenues will be utilized to support KS educational operations and thus enhance the sustainability of the trust.

The KS North Shore Master Plan was completed in March 2008. The plan, which was prepared with significant input and consultation with the community and public agencies, consisted of the following six general planning elements:

- Increase natural and culture resource stewardship and management;
- Expand educational opportunities;
- Establish alternative energy uses;
- Enhance diversified agriculture & food production;
- Develop/redevelop rural commercial; and
- Develop rural residential.

The plan called for seven catalyst projects as part of the implementation process. The proposed project specifically addresses Phase 1 (Entitlement & Predevelopment Phase) of Catalyst Project #4 "Matsumoto Redevelopment Project". A major objective of the project is an economic purpose, to increase the long-term lease rent revenue from this asset. A recent market study shows that there are demands for more retail space in the North Shore area. While majority of the retail establishments in Hale'iwa focus primarily on tourism market, this commercial development project will also cater to local residents' needs. The higher objective of this project is bettering the whole of Hale'iwa as part of the overall North Shore community. KS is committed to redeveloping this commercial asset in a manner that supports the community's vision to retain and enhance Hale'iwa's historic country character.

The retail space demand for the project was projected at approximately 30,000 sq.ft. The current retail composition for Hale'iwa is heavily weighted towards the tourist/transient market segment. A large percentage of the region's sales are generated from the transient market. Consumer expenditures by the local resident markets are being spent outside the North Shore trade area. This creates a sizeable opportunity for retailers that target the local resident market. Recent broker interviews indicate there is a healthy interest from restaurants and retailers seeking to establish a presence in Hale'iwa.

A major goal of the project is to improve the pedestrian connectivity and preserve the rural main street character of historic Haleiwa Town. To support this goal, the project will feature a central

gathering place and shaded courtyards. Further creation of walking pathways to address safety considerations of leisure-oriented pedestrians is vitally important to address existing conditions:

- Reduce and remove long customer lines that cue into street edge and traffic
- Separate pedestrians and vehicles with landscaping and improvements
- Provide safe photo taking opportunities to discourage darting into traffic to take photographs
- Manage access and organize parking ingress and egress points

1.4 PROJECT LOCATION AND SITE CHARACTERISTICS

The proposed project is located in the historic Hale'iwa town of Oahu's North Shore along Kamehameha Highway, which is the main street through Hale'iwa town. Located less than five miles from world-famous surf spots, Hale'iwa serves as an economic hub of the North Shore. The area offers one of Hawaii's unique rural commercial settings, dating back to the plantation era in the late 1800s.

The project site is bordered by retail stores to the north, Kamehameha Highway to the east, Hale'iwa Town Center to the south, and agricultural lands to the west. The neighborhoods surrounding the project site consist primarily of low-rise residential and low-rise commercial uses.

1.5 PHYSICAL CHARACTERISTICS OF THE PROJECT

A preliminary conceptual site plan and building elevations have been developed, as well as an assessment for deferred maintenance of the buildings. The plan consisted of rehabbing the existing buildings that are in working condition, while razing and replacing those that are obsolete and with significant deferred maintenance.

The preliminary conceptual site plan is presented in *Figure 1.6*). The development will include construction of new retail buildings and additions to the existing buildings. All of the new buildings/additions will be one story high. A gathering courtyard is also being proposed on the existing Matsumoto store's parking lot. This shaded courtyard will serve as the central gathering place for the community and visitors at the center. A new 112-stall parking lot with bus loading spaces will be constructed on a portion of the current agricultural-zoned lands, behind the commercial storefront. The final build out of the project will provide up to 30,000 SF of Gross Leasable Area (GLA) of the existing buildings and the new buildings combined.

Sustainability features will be incorporated or pre-wired for future incorporation where appropriate. The construction of the new buildings will provide an opportunity for pedestrian walkway and landscape improvements along Kamehameha Highway. These improvements will create buffer between pedestrians and vehicles, offering a safe and pedestrian friendly environment while enhancing the historic scenic view along the highway.

The architectural/landscape design of the proposed project will adhere to the City and County of Honolulu's Hale'iwa Special District Design Guidelines.

Building Programs and Hours of Operation

The proposed redevelopment will add about 15,000 SF of GLA from the existing 13,477 SF of GLA (see *Table 1.1*). KS is committed to perpetuating local cultures and supporting local businesses. The proposed project will have a tenant mix of approximately 50% food and beverage tenants and 50% retail and office tenants. The establishments mix will cater to both local residents and visitors. A gathering space located at the courtyard will be used for various activities that perpetuate local culture and economy, for example, farmer's market, cooking demonstrations, and performances.

The expected hours of operation for restaurant tenants are Monday to Friday, 11 am - 9:30 pm and Saturday and Sunday, 9 am to 9:30 pm. Hours of operation for all other tenants, including retail, smaller F&B, office and "fruit stand" are Monday to Sunday, 10 am – 6 pm.

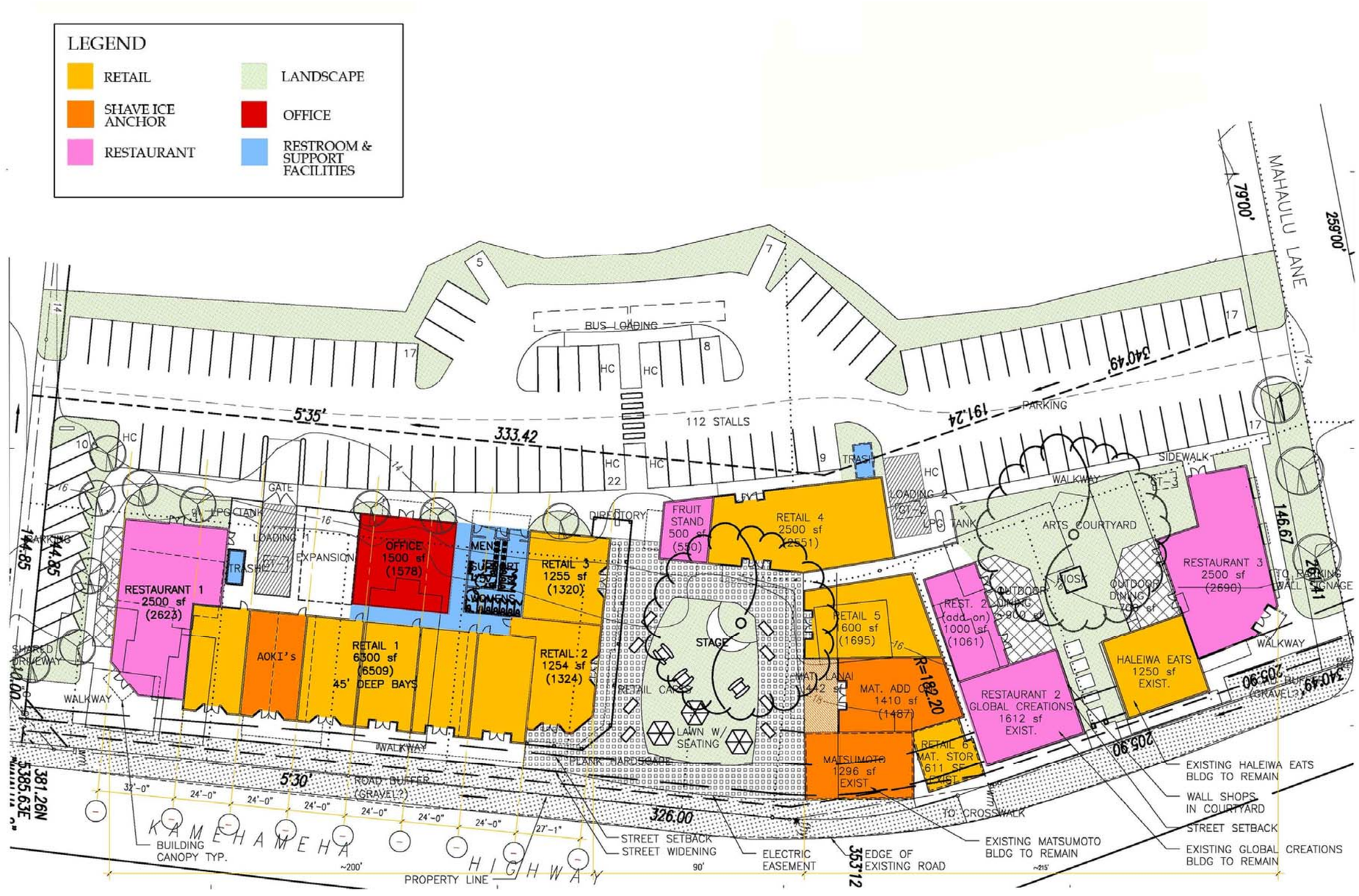


Figure 1.6 Haleʻiwa Commercial Redevelopment Conceptual Site Plan (subject to change)

Figure 1.7 Hale'iwa Commercial Redevelopment Project Conceptual Rendering (subject to change)

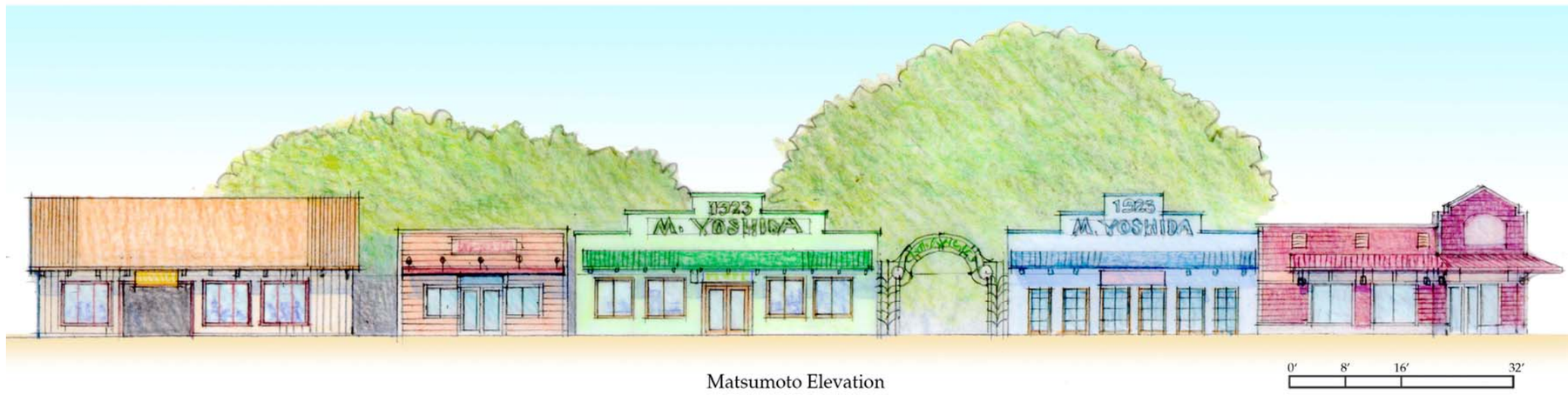


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Figure 1.8 Hale'iwa Commercial Redevelopment Conceptual Elevations (subject to change)

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Establishment Type	Gross Leasable Area (SF)	
Retail		
Retail 1	6,300	
Retail 2	1,254	
Retail 3	1,255	
Retail 4	2,500	
Retail 5	1,600	
Retail 6	611	
Retail 7 (currently Hale'iwa Eats)	1,250	
Subtotal Retail	***14,770***	***51%***
Food and Beverages (F&B)		
Matsumoto Shave Ice (existing)	1,296	
Matsumoto Shave Ice (add on)	1,410	
Matsumoto Shave Ice (lanai)	442	
Fruit Stand	500	
Restaurant 1	2,500	
Restaurant 2 (currently Global Creations)	1,612	
Restaurant 2 (add on)	1,000	
Restaurant 2 (Outdoor Dining Area)	900	
Restaurant 3	2,500	
Restaurant 3 (Outdoor Dining Area)	700	
Subtotal F&B	***12,860***	**44%**
Office		
Office	1,500	
Subtotal Office	***1,500***	**5%**
TOTAL	***29,130***	**100%**

Table 1.1: Hale'iwa Commercial Redevelopment Space Program

Circulation and Off-Street Parking

The new 112-stall asphalted parking area will have two access points off the existing roadways, which include Mahaulu Lane and Hale'iwa Town Center driveway. A bus loading area will also be located in the parking lot area, with a direct pedestrian connection to the plaza and two rear courtyards. Currently, tourists are being dropped off from the bus along Kamehameha Highway which poses pedestrian safety and traffic concerns. The on-site bus loading area will help increase pedestrian safety and improve traffic flow along Kamehameha Highway.

1.6 DEVELOPMENT SCHEDULE AND SUMMARY OF PROJECT COSTS

The Hale'iwa Commercial Redevelopment Project will be implemented in phases to minimize impacts on tenants' business operations and to the surrounding area. The construction is expected to begin in 2013 and be completed in 12 to 18 months depending on project phasing. The vertical costs and the infrastructure improvement costs for this redevelopment are estimated at $5 million and $1.8 million respectively (excluding road improvement costs).

1.7 PERMITS AND APPROVALS REQUIRED

The following permits and approvals will be required from the City and County of Honolulu:

Change of Zone: The project site is currently zoned Residential District (R-5), Neighborhood Business District (B-1), and General Agricultural District (AG-2). A Change of Zone to Neighborhood Business District (B-1) for parcels fronting Kamehameha Highway and Country District for parcels located behind the commercial frontage is proposed to allow for commercial and parking use.

Consolidation and Subdivision: A Consolidation and Subdivision Application will be filed to consolidate and subdivide the property parcels to correspond with the proposed development and Change of Zone.

Hale'iwa Special District Permit (Major): The project is located in Hale'iwa Special District and includes major modification/addition and demolition to historic structures visible from Kamehameha Highway and those listed in Exhibit 21-9.17 in the Revised Ordinance of Honolulu. A Special Design District Permit (Major) is required for such actions. A Special Design District Permit (Minor) is typically required for removal of trees that are over six inches in diameter and are visible from Kamehameha Highway. However, the site plan and landscape plan submitted as part of the Special Design District Permit (Major) will fulfill this requirement.

Joint Development Agreement (JDA) and Conditional Use Permit (Minor): A Joint Development Agreement is required for development of two or more adjacent zoning lots under a single project. A Conditional Use Permit (Minor) is also required for the joint use/off site parking facility and wastewater treatment unit will be located on a portion of the proposed Country District parcel. The parking facility and wastewater treatment unit are intended to serve the commercial uses on the Neighborhood Business District (B-1) parcel.

Required Permits for Construction: Several approvals will be required from the City and County of Honolulu and State of Hawai'i to implement the redevelopment, including:

State of Hawai'i

- National Pollutant Discharge Elimination System (NPDES) Permit – Storm water (State Department of Health)
- Wastewater System (DOH)

City and County of Honolulu

- Building Permit for Buildings, Electrical, Plumbing, and Sidewalk/Driveway Work (Department of Planning and Permitting)
- Grading, Grubbing and Stockpiling Permit (Department of Planning and Permitting)
- Demolition Permit
- Water System (Board of Water Supply)
- Street Usage Permit (Department of Transportation Services)

1.8 Agencies, Organizations and Individuals Contacted during the Pre-Consultation Process

The following agencies and groups with jurisdiction or potential interest have been consulted/contacted in the preparation of the Environmental Assessment of the planned project. Also, on Saturday February 12 KS held a public gathering at Emerson Hall, at which the Hale'iwa Commercial Redevelopment Project was presented in concept to attendees (100+/-), and comments were gathered.

State of Hawai'i
State Senator Laura Figueira, District 22
State Representative Gil Riviere, District 46
Department of Business, Economic Development & Tourism – Planning Office
Department of Health- Environmental Planning Office
Department of Land and Natural Resources (DLNR)
DLNR, Historic Preservation Division
Department of Transportation
Office of Environmental Quality Control
Office of Hawaiian Affairs

City and County of Honolulu
Office of the Mayor
Council Member Ernie Martin, District 2
Board of Water Supply
Department of Design and Construction
Department of Environmental Services
Department of Facility Maintenance
Department of Planning and Permitting
Department of Planning and Permitting – Traffic Review Branch
Department of Transportation Services
Fire Department
Police Department

Federal Agencies
US Fish and Wildlife Service
US Army Corps of Engineers

Individuals, Community Groups, Surrounding Businesses, and Land Owners
North Shore Neighborhood Board #27
North Shore Chamber of Commerce
Haleiwa Town Center,LLC
Kumpang and Ronald Soroos
Morioka Family Trust
Ming-Li Wang and David Robichaux
Janet and Charles Fujimoto
Wilma and Ronald Ward
First Hawaiian Bank
Stanley and Noriko Matsumoto
Cathy and Michael Aoki
Wayne and Grace Shimamoto
North Shore Trading Company, Inc
Liliuokalani Protestant Church
Hawaii Conference Foundation
Adela Valmoja
Marlene Abrigo
Joel Asato
Gladys Awai-Lennox
Jan Becket
Diane Canon
Emmaline Causey
Malia Evans
Phyllis "Coochie" Cayan, State Historic Preservation Division, History and Culture Branch
Dino Harvest
Butch Helemano
Betty Jenkins
Thomas Lenchanko
Kawaika Mark McKeague, Chair, Oahu Island Burial Council
Clyde Nāmuʻo, Office of Hawaiian Affairs
Kunani Nihipali
Henry Preece
Cynthia Pua-Nichols, Waialua Hawaiian Civic Club
Leimaile Quiteves, Waialua representative, Oahu Island Burial Council
Paul Sensano
Thomas Shirai
Janell Chun Silva
John R Kahaʻi Topolinski
Owana Salazar
Lavina "Maile" Agadar
North Shore Outdoor Circle
Historic Hawaiʻi Foundation

2.0
DESCRIPTION OF THE ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND MITIGATION MEASURES

2.0 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.

2.1 CLIMATE

Existing Conditions
The project site has a mild, semi-tropical climate of North Shore O'ahu. 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.

Winds from the northeast, known as trade winds, are the most predominant over the Hawaiian Islands. Typical wind velocities range from 3 to 14 knots. In the winter, there is a shift in the wind patterns characterized by the arrival of the westerly "kona" winds. Westerly winds typically are characterized by the presence of strong winds and high wave activity from the southwestern sector of the Pacific.

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.

2.2 TOPOGRAPHY

Existing Conditions
The project site generally slopes from the highway toward the shoreline. Elevations range from approximately 20 feet above mean sea level (MSL) along the highway to an elevation of 15 feet in the rear of the property. According to a topographic survey by Honolulu Land Consultants conducted in 2008 (*Figure 2.1*), the area fronting Kamehameha Highway is approximately 6 to10 feet higher in elevation than the lowest undeveloped area towards the middle of the project site. The elevations along the rear property line are approximately four feet higher than the lowest undeveloped area, therefore creating a sump within the property.

Anticipated Impacts and Mitigation Measures
Short-term impacts to the site will include approximately 2,700 cubic yards of excavation and 7,100 cubic yards of embankment required for implementation of this project. There will be no substantial alteration to the existing topography of the project site. Slight changes will be made to the site topography to support drainage requirements and building sites. The current sump area will be used as stormwater detention area. The topography of the area will not be significantly changed. Grading permits, approved by the Hawaii State Department of Land and Natural Resources Historic Preservation Division and DPP would be required for all grading activities. During all phases of construction, erosion control practices would comply with State, County and

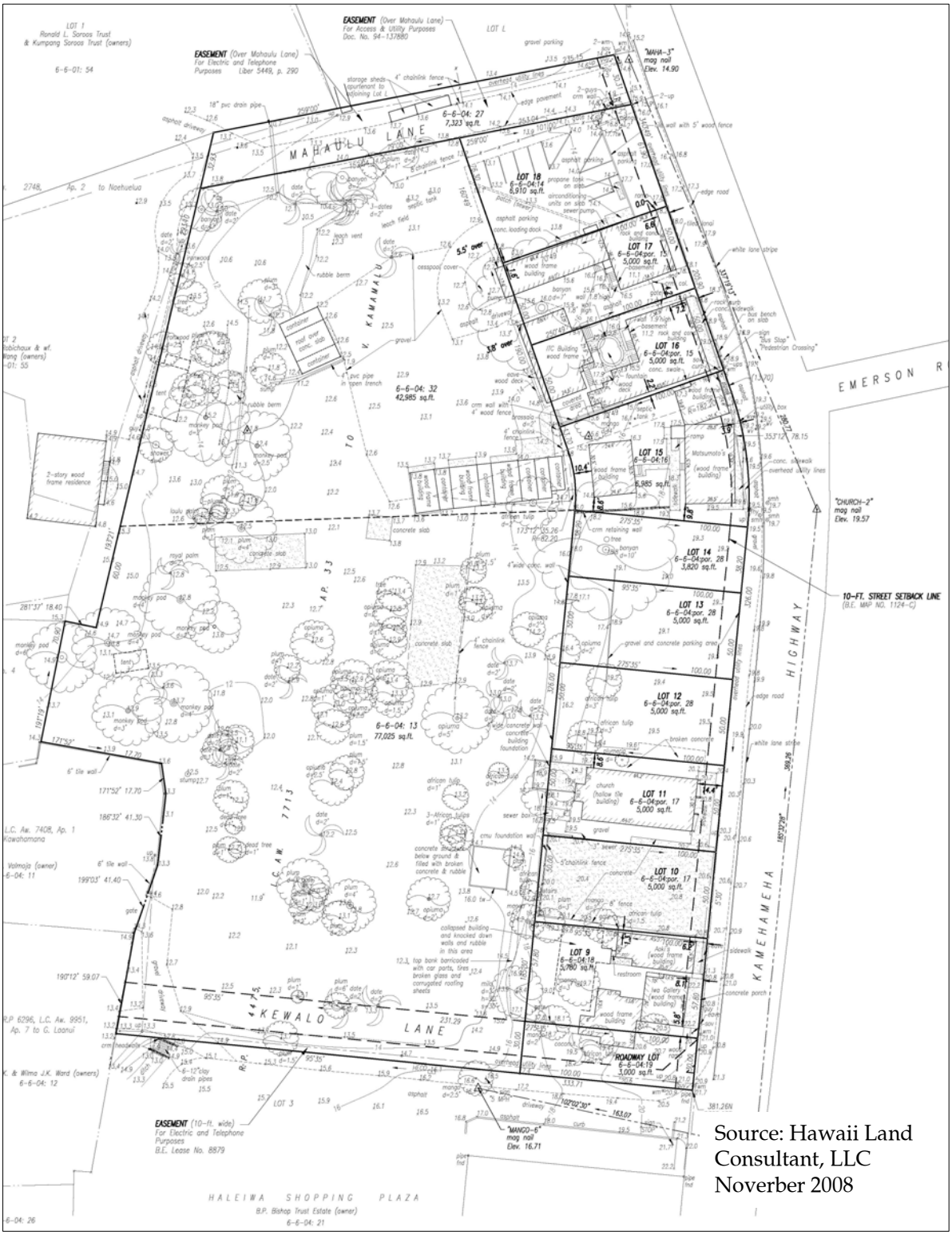


Figure 2.1 Existing Topography

Federal regulations. National Pollutant Discharge Elimination System (NPDES) general permit coverage authorizing discharges of storm water associated with construction activities would be required for the project from the State Department of Health, Environmental Management Division, Clean Water Branch. Best management practices to control erosion during construction would be a component of the NPDES permit. Mitigation measures related to soils and grading are described in detail in the next section.

2.3 SOILS

Existing Conditions

According to the U.S. Department of Agriculture Soil Conservation Services (USDA) soil survey data, the project area is consists of Hale'iwa Silty Clay (HeA) and Kawaihapai Clay Loam (KIB) soil series (*Figure 2.2*). Soils of the Hale'iwa series consists of "well-drained soils on fans and in drainage ways along the coastal plains…developed in alluvium derived from basic igneous material…used for sugarcane, truck crops, and pasture". Representative profile of this soil's surface layer is dark-brown silty clay about 17 inches thick. Permeability of this soil type is moderate, runoff is very slow, and the erosion hazard is no more than slight.

Soils of the Kawaihapai series consist of "well-drained soils on fans and in drainage ways along the coastal plains…formed in alluvium derived from basic igneous rock in humid uplands…used for sugarcane, truck crops, and pasture." Runoff for this soil type is slow, and the erosion hazard is slight.

Anticipated Impacts and Mitigation Measures

Preparation of the land for construction will involve short-term impacts associated with clearing and grading operations. Temporary erosion control measures will be incorporated during the construction to minimize soil loss and erosion hazards. Best Management Practices will include temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences, inlet protection, slope protection, stabilized construction entrances and truck wash-down areas. Periodic water spraying of loose soils will be implemented to minimize air-borne dirt particles from reaching adjacent properties. 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. Permanent sediment control measures such as ground cover planting, hardscape, and other landscaping will be used once construction is completed.

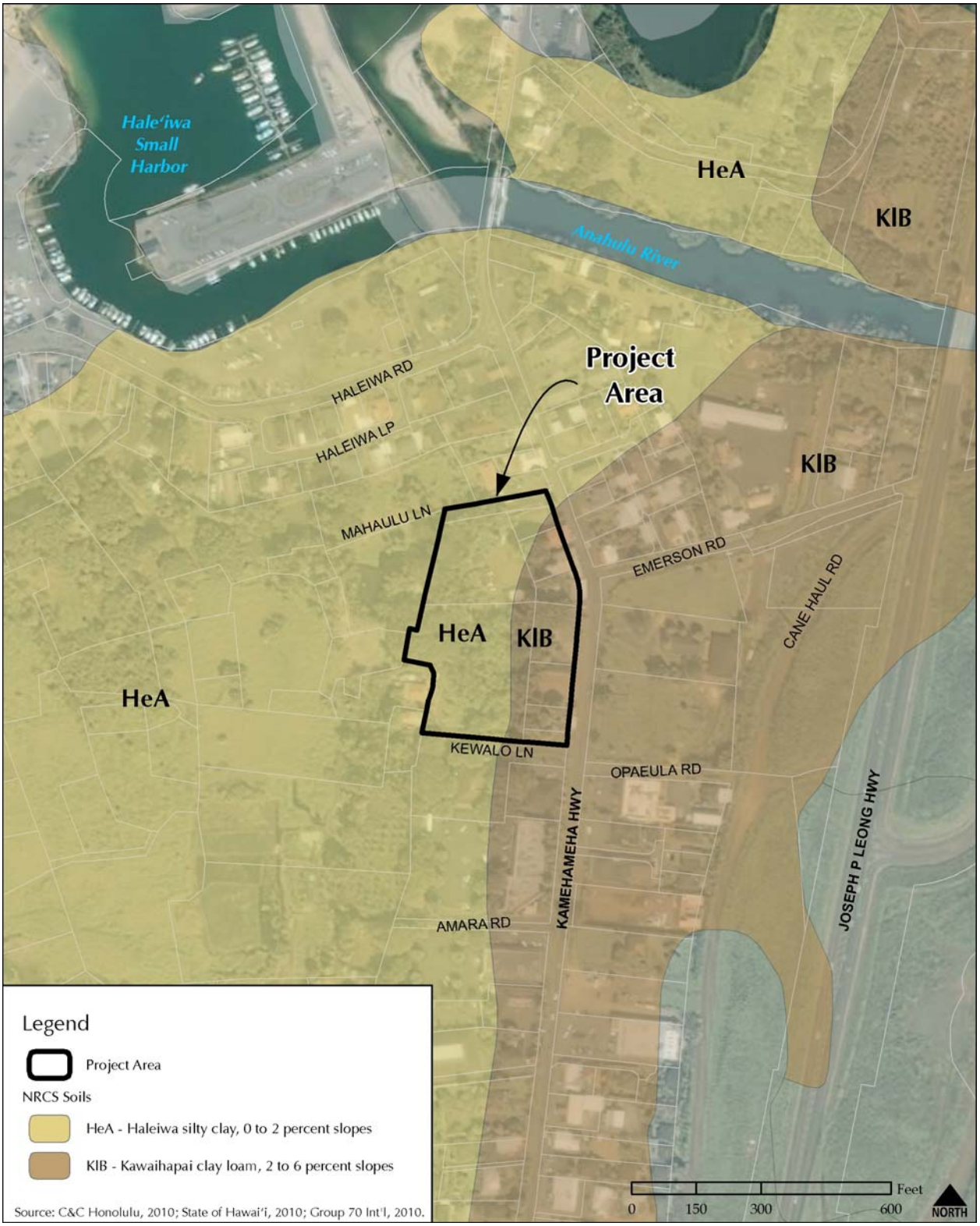


Figure 2.2 Natural Resources Conservation Service (NRCS) Soils Survey Map

2.4 SURFACE WATER, GROUNDWATER RESOURCES, AND DRAINAGE

Existing Conditions

According to Lyon Associates, Inc. (2011), runoff within the project vicinity generally flows from property to property due to the lack of underground drainage collection system. The pavement along Kamehameha Highway slopes downward in the direction from Kewalo Lane to Mahaulu Lane. The sump area within the project site is prone to flooding. A 18-inch drain pipe provides relief for the sump area and directs runoff in the direction of the adjacent property.

The Hale'iwa Shopping Center drainage report prepared by Fukunaga & Associates (1976) indicates that the guiding principle for development of the shopping center has a limitation of the 50-year peak flow discharge to downstream properties, such that the flows do not exceed predevelopment flow rates. The report also identifies two ponding areas, with piped outlets to attenuate the increase in peak runoff to adjacent properties.

A wetland delineation report prepared by AECOS, Inc in March 2011 (*Appendix A*) indicates that there are three potential wetland areas on the project site, designated as area A, B, and C in *Figure 2.3*. However, the soil, vegetation, and hydrology data analysis indicates that only two areas (area A and B) exhibit evidence of meeting the legal indications of wetlands based on the United States Army Corps of Engineers 1987 Wetlands Delineation Manual. According to the Hawai'i wetland analysis protocol proposed in Erickson & Puttock (2006), wetland in area A is considered a groundwater-driven/fresh/depression/mineral substrate palustrine wetland. Wetland in area B is considered a precipitation driven/fresh/depression/mineral substrate palustrine wetland. Using the Cowardin classification system (Cowardin et al., 1979), area A is classified as PUBHx and PUBH (palustrine, unconsolidated bottom, permanently flooded excavated and palustrine, unconsolidated bottom, permanently flooded) wetland. Area B is a PEM1C (palustrine, emergent, persistent, seasonally flooded) wetland. The delineated area of wetland A is approximately 2,040 sq.ft. The delineated area of wetland B is approximately 2,380 sq.ft. These two wetlands are possibly connected as part of a shallow local drainage ditch during periods of flooding and may be connected to the larger wetland in proximity of the project area.

The project site is located in the Waialua system groundwater management area. The nearest major surface water source, in proximity to the proposed site, is Anahulu River. The river is located about 0.1 miles north of the project site and flows into Hale'iwa Small Boat Harbor. There is no perennial or intermittent stream in or adjacent to the proposed project area. The project is located in State of Hawai'i Department of Health inland waters class 2 area. Nearest ocean waters off the project site are designated as Class A waters (Hale'iwa Small Boat Harbor). 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.

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 grading will also closely follow the existing grades, to the extent possible.

The U.S. Army Corps of Engineer (USACE) is in the process of making its final jurisdictional determination over the identified wetlands. If the USACE determines to take jurisdiction, a permit

Figure 2.3 Location of Potential Wetland Areas

for any modification of the waters of the United States of America (Section 404, Clean Water Act) will be required. If a Section 404 Permit is required, then Section 401, Water Quality Certification, is also required. The DOH is the regulatory authority for Section 401. Section 404 (b)(1) of the Clean Water Act provides guidelines to limit adverse impact to aquatic resources and a Mitigation Memorandum of Agreement (MOA) between the ACOE and the U.S. Environmental Protection Agency provides guidance for implementing the 404(b)(1) guidelines. According to the Mitigation MOA, the following steps shall be followed:

1) determination that potential impacts have been avoided to the maximum extent practicable;
2) remaining unavoidable impacts will be mitigated to the extent appropriate and practicable by requiring steps to minimize the impacts;
3) compensate for aquatic resource values.

Appropriate and practicable steps to minimize the adverse impacts will be required through project modifications and permit conditions. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has been required. Until a functional loss and value methodology is developed for wetlands in Hawai'i, compensatory mitigation in the Honolulu District will be based on an acreage calculation with a typical requirement of, at a minimum, one replacement acre for every one acre of waters of the U.S. lost. Mitigations may include either or a combination of on-site mitigation and off-site mitigation. Mitigation projects may include preservation, enhancement, restoration, creation, or a combination of these projects.

Best management practices (BMP) for stormwater management will be used 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.

2.5 FLOOD AND TSUNAMI HAZARDS

Existing Conditions

The proposed project site is located in flood Zone X as shown on the Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) 15003C0105G for the City and County of Honolulu dated June 2, 2005 (*Figure 2.4*). Area within Zone X is outside the 0.2% annual chance floodplain.

Anticipated Impacts and Mitigation Measures

Zone X includes areas of minimal hazard from the principal source of flood in the area and the Flood Insurance Program does not have any regulations for development within this district. No mitigation measures are required.

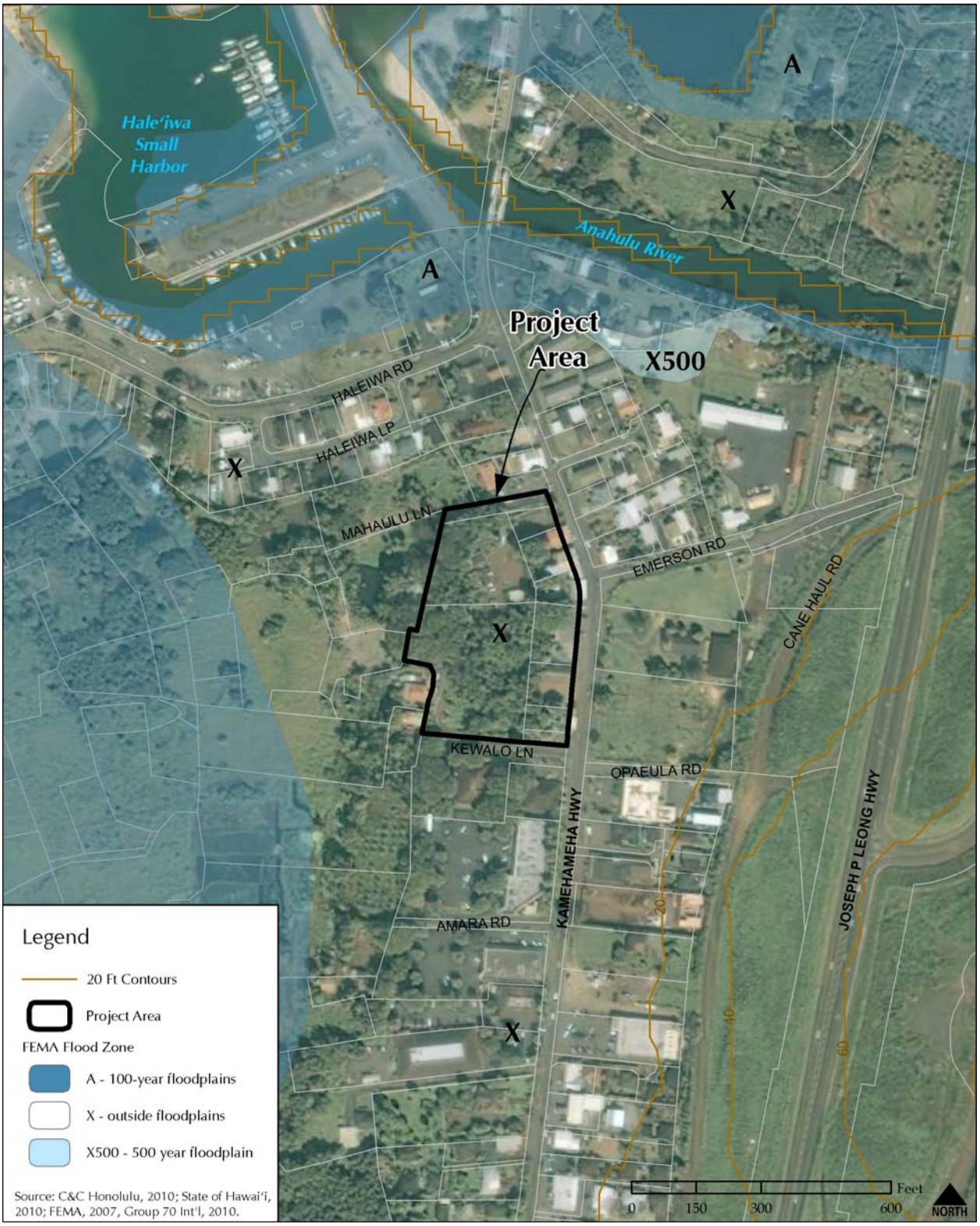


Figure 2.4 Flood Insurance Rate Map

2.6 FLORA

Existing Conditions

The flora in the project site consists of moneypods, plums, dates, iron wood trees, shower tree, lo'ulu palm, royal palm, 'opiuma, African tulips, mango trees, brassaia, plumeria, coconut, and milo tree. Majority of the trees are in the undeveloped area of the site. A tree assessment report was prepared by Steve Nimz and Associates, Inc in March 2011(*Appendix B)* to collect data on the existing trees and palms. Eighty-one trees and palms were identified and numbered on the site topographic survey map. A detailed spreadsheet corresponds to the site map records the following data of each tree and palm:

1. Tree number
2. Species- common and scientific name
3. Trunk diameter
4. Height
5. Crown spread
6. Health rating (visual inspection)
7. Structural rating (visual inspection)
8. Disposition rating (remain, prune, relocate, remove)
9. Comments regarding health, structural condition
10. Photographs

The majority of the trees identified are volunteer growth, including Opiuma, Java Plum, African Tulip and Date Palms. Several of these are rated as invasive species.

Anticipated Impacts and Mitigation Measures

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. The proposed improvements will enhance the natural vegetation on the site and overall appearance of the project. The landscaping will incorporate non-invasive, drought-tolerant species to minimize irrigation requirements and water needs. Trees that are identified as being in an advanced state of decline will be removed for safety concerns. Other existing trees will be removed, as necessary, to allow for construction of the improvements. Two large ficus trees near Hale'iwa Eats and on Matsumoto's parking lot will be preserved and integrated as part of the overall landscape plan. There are approximately twelve date palms, one coconut palm, one monkeypod tree, and one neem that can be relocated and used for the project. Trees that are identified as worthy of preserving according to the tree assessment report will also be given special consideration.

2.7 FAUNA

Existing Conditions

The project site's proximity to a wetland area located makai of the site raised a concern over the potential use and/or present of the federally endangered waterbirds– Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*), Hawaiian moorhen (Gallinula chloropus sandvicensis), Hawaiian stilt (Himantopus mexicanus knudseni)- on the site by the United State Fish and Wildlife Service (USFWS). The USFWS is also concerned about the potential effect of the development on

the endangered Hawaiian hoary bat (*Lasiurus cinereus*) and the Wedge-tailed Shearwater (*Puffinus pacificus chlororhynchus*) which is protected under the federal Migratory Bird Treaty Act (MBTA). To address these concerns, Rana Biological Consulting, Inc conducted an avian and mammalian surveys of the project site in February 2011 to determine if there are any avian or mammalian species currently listed, or proposed for listing under either federal or State of Hawai'i endangered species statutes within or adjacent to the study area. The study emphasizes on determining whether there is any current usage of any part of the site by listed waterbird species. The survey results are summarized below.

Avian Resources

A total of 98 individual birds of 14 species, representing 10 separate families, were recorded (*Appendix C).* A Black-–crowned Night-–Heron (*Nycticorax nycticorax hoactli*), which is an indigenous resident breeding species, was recorded flying over the project site towards the ocean. One chicken species (*Gallus sp.*) recorded is a domesticated species that is not currently considered to be established on the Island of O'ahu. The remaining 12 species recorded are all considered to be alien to the Hawaiian Islands. No avian species currently protected or proposed for protection under either the federal or State of Hawai'i endangered species programs were detected during the course of this survey.

There are no nesting colonies nor appropriate nesting habitat for any of the seabird species present on O'ahu on, or immediately adjacent to the project site. No seabirds were recorded during the survey.

Mammalian Resources

Three mammalian species were detected during the course of the survey. Dogs (Canis f. familiaris) were seen in fenced yards adjacent to the project site. Five cats (Felis c. catus) were seen within the project site. One small Indian mongoose (*Herpestes a. auropunctatus*) was seen in the ITC Water Management baseyard area. No mammalian species currently protected or proposed for protection under either the federal or state of Hawai'i endangered species programs were detected during the course of the survey.

Rodents were also not detected during the survey. However, it is likely that the four established alien *muridae* found on O'ahu which includes roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*) and Polynesian rats (*Rattus exulans hawaiiensis*) use various resources found within the general project area. These rodents are deleterious to native ecosystems and the native faunal species dependant on them.

No Hawaiian hoary bats were detected during the course of this survey, as bats are crepuscular and nocturnal species. However, given a small number of this species' recorded on O'ahu, it is unlikely that the bats will use any resources on the project site.

Critical Habitat

There is no federally delineated Critical Habitat present on or adjacent to the property.

Anticipated Impacts and Mitigation Measures

The low spot on the project site can create occasional standing water after a heavy rain which may attract the waterbirds, especially the Black-necked Stilt. The stilts are likely to investigate any standing water regardless of depth, as a potential foraging site. Ducks, coots, and moorhen require

deep water. The potential impact of the site redevelopment to the listed waterbirds is during the clearing and grubbing phases of the construction. As there is no permanent suitable nesting habitat for these waterbirds on the project site, it is unlikely that the redevelopment project will pose any threat to these species. Also, prior to clearing and grubbing activities no standing water should be allowed to pond on the site so that it does not attract the stilts.

Although no seabirds were recorded during the survey, it is likely that they will fly over the site occasionally. Nocturnally flying seabirds, especially in summer and fall when they fledge to the ocean, can become disoriented by exterior lighting. When disoriented, seabirds may collide with manmade structures, which could be fatal. To reduce the potential for seabirds fallout, it is recommended that shields be installed for construction lighting and permanent lighting. This will minimize the threat of disorientation of the Wedge-tailed Shearwaters.

The potential impact of the site development to Hawaiian hoary bats is during the clearing and grubbing phases of the construction during their breeding season between May and July. To minimize this potential impact, the clearing of woody vegetation taller than 15 feet will be restricted between May and July.

The redevelopment of the site will have no impacts to federally designated Critical Habitat.

2.8 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. Long term air quality effects of the project are minimal. Vehicle and bus emissions will result from transporting of visitors and workers associated with operation of the commercial establishments.

2.9 NOISE

Existing Conditions
The primary noise sources in the area of the project site are related to traffic and commercial 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 small scale commercial activities.

Anticipated Impacts and Mitigation Measures
Short term noise receptors are the residences and businesses in the area. Adjoining neighbors may notice noise from the increased activity and traffic at the project site. Most of the uses will not generate extended, high level of noise and will be limited by hours of operation. No long-term adverse noise impact is expected as a result of 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 will 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 commercial project will primarily associated with vehicle traffic. Noise from daytime activities such as occasional cultural performances will be limited within acceptable noise level and duration to avoid disrupting the adjoining neighborhood.

2.10 ROADWAYS AND TRAFFIC

A Traffic Impact Analysis Report was prepared by The Traffic Management Consultant in April 2011 (*Appendix D*). The report evaluates existing traffic conditions of the roadways within the project area and future traffic conditions with and without the project. Kamehameha Highway, Kewalo Lane, Mahaulu Lane, and Emerson Street were evaluated in this report. The intersection Level of Service (LOS) analysis, performed for this study, is based upon procedures presented in the Highway Capacity Manual (HCM), published by the Transportation Research Board, 2000. HCM defines LOS as "a quality measure describing operational conditions within a traffic stream". Several factors may be included in determining LOS, such as: speed, travel time, freedom to maneuver, traffic interruptions, driver comfort, and convenience. LOS's "A", "B", and "C" are considered satisfactory Levels of Service. LOS "D" is generally considered a "desirable minimum" operating level of service. LOS "E" is an undesirable condition, and LOS "F" is an unacceptable condition. Intersection LOS is primarily based upon average delay per vehicle, which is expressed in seconds per vehicle (sec/veh).

Existing Conditions
There are three roadways that provide vehicle access to the project site: Kamehameha Highway, Kewalo Lane, and Mahaulu Lane. Public Transit to the project site is available through the City and County of Honolulu The Bus system. There are two bus routes available to the project site: Bus

Route 52 - Wahiawa Circle Isle and Route 83 – Wahiawa-Waialua. There is a bus stop right in front of the project site.

Kamehameha Highway is a two-lane roadway within the City right-of-way (ROW) fronting majority of the project site and providing main vehicle access to the site. The current right-of-way (ROW) for Kamehameha Highway fronting the project varies from about 40 to 50 feet. Currently there are six vehicle access points off Kamehameha Highway to the project site which includes Kewalo Lane, a driveway between Aoki's and House of Restoration Church, two entry points at Matsumoto's parking lot, one access point at ITC Water Management (between Global Creations/Haleiwa Eats), and Mahaulu Lane.

Kewalo Lane is a two-way, two-lane, private driveway, which provides access to the Hale`iwa Town Center and several residences. Kewalo Lane is stop-controlled at its Tee-intersection with Kamehameha Highway. Mahaulu Lane is a two-way, two-lane, private driveway, which provides access to several residences and ITC Water Management baseyard. Mahaulu Lane is stop-controlled at its Tee-intersection with Kamehameha Highway.

Emerson Street is a two-way, two-lane, local street, opposite Matsumoto Shave Ice Store which provides access to several residences. Emerson Street is stop-controlled at its Tee-intersection with Kamehameha Highway.

Traffic count surveys were conducted on Kamehameha Highway at Emerson Street, Kewalo Lane, and Mahaulu Lane during the weekday PM peak hour of traffic (between 3:15 PM and 4:15 PM) and during the weekend peak hour of traffic (between 2:30 PM and 3:30 PM.). The AM peak period of traffic was not surveyed since most of the commercial activities at the proposed redevelopment project is not expected to be open during the AM commuter peak period. The State Department of Transportation's traffic data also indicated that there is no apparent peak period of traffic in the morning.

The slow-moving and stop-and-go traffic through Hale`iwa Town is most apparent along the existing project site, where there are several driveways and side streets, no provisions for left-turn lanes, and parking along Kamehameha Highway. When the makai parking areas are at capacity, customers park on Emerson Street and along the mauka side of Kamehameha Highway. The resulting pedestrian traffic across Kamehameha Highway creates additional delay to through traffic and poses potential safety concerns.

During the existing PM peak hour of weekday traffic and weekend peak hour of traffic, Kewalo Lane, Emerson Street, and Mahaulu Lane operated at LOS "C" at their respective intersections with Kamehameha Highway. Traffic flow on Kamehameha Highway was slow moving due to turning traffic, pedestrians crossing Kamehameha Highway, and vehicles parking on Kamehameha Highway.

Anticipated Impacts and Mitigation Measures

Year 2014 PM peak hour of weekday and weekend traffic analysis indicate that without the proposed project, the Kamehameha Highway intersections within the study area are expected to continue to operate at LOS "C". With the proposed redevelopment, year 2014 PM peak hour of weekday traffic analysis indicated that Kewalo Lane and Mahaulu Lane are expected to operate at LOS "D" at Kamehameha Highway. Emerson Street is expected to continue to operate at LOS "C" at Kamehameha Highway. With the proposed redevelopment, year 2014 PM peak hour of weekend traffic analysis indicated that Kewalo Lane and Mahaulu Lane are expected to operate at

LOS "D" and LOS "E", respectively, at Kamehameha Highway. Emerson Street is expected to continue to operate at LOS "C" at Kamehameha Highway.

Short term traffic associated with construction activities will be managed to avoid disruption of highway operations. In the long term, the proposed redevelopment is expected to improve traffic flow on Kamehameha Highway fronting the project site and create a safer and more pedestrian-friendly environment. The proposed plan removes parking and pedestrian traffic from Kamehameha Highway, reduces congestion and provides a more "orderly" flow into two major points of ingress/egress, as compared to the existing six vehicular access points along the project frontage. The proposed parking lot will be located to the rear of the redeveloped site with access from Mahaulu Lane and Kewalo Lane. The parking layout provides a 350% increase in on-site parking for the site and has a designated bus loading zone to help prevent traffic congestion along Kamehameha Highway. The proposed parking lot is expected to improve traffic flows, reduce on-street parking, and reduce the pedestrian traffic crossing Kamehameha Highway along the frontage of the site. The new site plan will also redirect Matsumoto store's queuing from the Kamehameha Highway frontage to the side courtyard, which will greatly improve pedestrian safety and reduce disruption on through traffics. However, the diversion of site traffic to Kewalo Lane and Mahaulu Lane is expected to create additional delays at these adjacent intersections. Four (4) alternative schemes were developed and consulted with TRB to mitigate the expected traffic impacts on Kamehameha Highway at Kewalo Lane and Mahaulu Lane intersections. A summary description of each scheme is presented below.

Scheme 1 - Kamehameha Highway will be widened to provide a 34-foot wide travel way along the entire length of the project, which includes two 12-foot wide through lanes, a 10-foot wide median left-turn lane, and 13-foot wide shoulders. The road widening will extend beyond the project frontage to provide for 80 foot-long left-turn storage lanes and 50 foot-long median shelter lanes at Kewalo Lane and at Mahaulu Lane. A 40 foot-long left-turn lane also will be provided at Emerson Street.

Scheme 2 – Because Scheme 1 is expected to severely impact several existing historical buildings between the Matsumoto Shave Ice Store and Mahaulu Lane, the City has reduced its requirement for a 13-foot wide shoulder to an 8-foot wide shoulder, with a raised curb at the pavement edge, along the existing buildings that are expected to remain. As the proposed improvements will also affect properties not owned by Kamehameha Schools, including Miura Store to the north of Mahaulu Lane, the City reduced its requirement of a 10-foot wide median lane to a 9-foot wide median lane and its design speed on Kamehameha Highway, north of Mahaulu Lane, from 30 mph to 25 mph. In this scheme, the road widening will only occur along the left-turn lane and the median shelter lane ROW. The road widening impacts will be less extensive than Scheme 1.

Scheme 3 - Provides a longer 100 foot-long left-turn lane and a 50 foot-long median shelter lane on Kamehameha Highway at Kewalo Lane only. Separate left-turn and right-turn lanes are also provided on Kewalo Lane, in anticipation of the increase in traffic demand. The longer left-turn storage lane at Kewalo Lane (100' vs. 80') will allow for more left-turning cars to queue to alleviate the elimination of the dedicated left-turn lane at Mahaulu Lane. It is assumed that left-turn movement from Kamehameha Highway to Mahaulu Lane to the project site will not be restricted in this scheme, since Mahaulu Lane also serves several residences behind the project property.

Scheme 4 - Is a modification of Scheme 2 where a left-turn lane is provided at both Kewalo Lane and Mahaulu Lane and separate left-turn and right-turn lanes are provided on Kewalo Lane.

However, a shorter left-turn storage lane is provided on Kamehameha Highway at Mahaulu Lane than in Scheme 2, and a median shelter lane will not be provided to reduce impact on historic buildings north of Mahaulu Lane. Detailed illustrations of each scheme are presented as part of *Appendix E- Preliminary Engineering Report.*

During the PM peak hour of weekday traffic with the proposed redevelopment project under Schemes 1, 2, 3, and 4, the traffic operations at the intersection of Kamehameha Highway and Kewalo Lane are expected to improve to LOS "C". Traffic operations on Mahaulu Lane at Kamehameha Highway also are expected to improve to LOS "C" under Schemes 1 and 2. An additional reduction in delay for traffic on Kewalo Lane, turning onto Kamehameha Highway, is expected under Schemes 3 and 4, due to the provisions for separate left-turn and right-turn lanes. Schemes 1, 2, and 4 are expected to reduce delay to northbound through traffic at Mahaulu Lane by providing a separate left-turn lane on Kamehameha Highway. Under Schemes 3 and 4, Mahaulu Lane is expected to continue to operate at LOS "D".

During the weekend peak hour of traffic with the proposed redevelopment project, the traffic operations at the intersection of Kamehameha Highway and Kewalo Lane are expected to improve to LOS "C" under all the alternative Schemes. Further improvement in delays to traffic on Kewalo Lane, turning onto Kamehameha Highway, is expected under Schemes 3 and 4. Traffic operations on Mahaulu Lane at Kamehameha Highway also are expected to improve to LOS "C" under Schemes 1 and 2. Mahaulu Lane is expected to continue to operate at LOS "E" under Schemes 3 and 4. Schemes 1, 2, and 4 are expected to reduce delay to northbound through traffic at Mahaulu Lane by separating the left-turn and through traffic.

Each alternative roadway improvement scheme is currently being evaluated for its feasibility in terms of impacts to the historic buildings and neighboring properties, pedestrian safety, and impacts on Hale'iwa town's rural character. In summary, all of the schemes are expected to mitigate the traffic impacts on Kamehameha Highway at Kewalo Lane by improving the LOS. Scheme 1 and 2 are expected to improve the LOS on Kamehameha Highway at Mahaulu Lane, while Scheme 4 will help reduce the delay to northbound traffic through the separate left-turn lane from Kamehameha Highway to Mahaulu Lane but will not improve the LOS.

However, all of the schemes, except for Scheme 3, will affect historic buildings or their overhangs/lanais and will require land acquisition at neighboring properties. Also, in all schemes, except for Scheme 3, the buildings' lanais and potentially the overhangs of the historic buildings will become part of the street ROW which creates safety hazard and harms the historic character of the buildings. Although, raised curb and gutter can help separate pedestrian from traffic, such design will have a significant adverse impact on Hale'iwa's rural character. Each scheme's impacts will be further discussed in Section 2.11 – Ulilities/roadways.

In regards to the impact on public transit, It is assumed that majority of visitors will be arriving by private vehicles and private tour buses. Therefore, no impact on public transit is anticipated. The bus stop may have to be temporary relocated during construction.

2.11 UTILITIES

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

Anticipated Impacts and Mitigation Measures
The proposed project will not create a significant increase in electrical demand. Electric and communication utility services will not be affected by the implementation of the proposed improvements. However, if the road widening as discussed in the section below is enforced, the utility lines will have to be relocated by the utility companies.

Water and Fire Support: Lyon Associates, Inc. prepared a Preliminary Engineering Report (PER) for the project in April 2011 (*Appendix E*). According to the PER, there are two active existing water lines located within Kamehameha Highway along the project frontage. An 8-inch line which runs along the southbound lane on Kamehameha Highway adjacent to the property serves parcels on both sides of the highway. A 16-inch main which runs along the opposite side of the road from the project site has no service connections in the immediate vicinity. There are also abandoned 6-inch and 8-inch lines running under Kamehameha Highway. There are four existing water meters servicing the project site and are located on TMK 6-6-004:15, 16, 17, and 18.

Three fire hydrants are located near the project vicinity. One hydrant is located on the project side of Kamehameha Highway at the terminus of Anahulu Place near the north end of the project. The second hydrant is directly across Kamehameha Highway from Lot 15 (Matsumoto's Store) and the third is directly across Kamehameha Highway from Lot 9 (Aoki's Store). The hydrants layout appears to comply with the Board of Water Supply (BWS) residential spacing standard of 350 feet.

A phone conversation with BWS has confirmed that new developments within the project vicinity will be limited to 25,000 Gallons per Day (GPD) of potable water supplied by the Honolulu Board of Water Supply (BWS).

Anticipated Impacts and Mitigation Measures
The proposed redevelopment will inevitably increase water demand. Four additional domestic water meters are proposed to allow one meter per building. An additional meter is also being proposed for irrigation on the south end of the property. These meters would connect to the existing 8-inch line on the project side of Kamehameha Highway. The Board of Water Supply's Water System Standards 2002, Table 100-18 Domestic Consumption Guidelines indicates average daily demand consumption of 3,000 gallons per acre for commercial developments, and 2,500 gallons per acre for Country District. The current layout of the proposed development limits the maximum daily demand to approximately 17,235 GPD which is well below what is allowed for new developments in this area. A submittal was made to BWS Project Review Section in December 2010 to verify water availability and a letter was received dated January 4, 2011 confirming that the system could accommodate the proposed redevelopment project. Waialua Aquifer will be the source of drinking water for the project.

Wastewater Disposal: According to the PER, 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. Currently, connection to the City's municipal wastewater system is not available. According to the PER, existing wastewater collection and disposal system for these lots compose of septic tanks & leach fields (also known as treatment Individual Wastewater Systems - IWS) and a cesspool. The plans obtained from the Hawaii State Department of Health (DOH) indicate that, there are two IWS systems as well as one cesspool on-site. The topographic survey confirms the structural locations for these systems; however no verification could be made on connections to existing buildings. The septic tank systems are about 20 years old and the cesspool is about 30 years old. The existing cesspool should be cleaned, removed and backfilled regardless of whether the rezoning of these parcels is approved or not, however it is possible to convert the cesspool to seepage pit when the project moves forward.

The verified wastewater systems on-site are as follows:

- Lot 17 TMK 6-6-4:15 – Registered Cesspool. Verified through DOH as well as the topographic survey. Located on TMK 6-6-004:32 but serving Lot17.
- Lot 16 TMK 6-6-4:15 – Registered IWS. Verified through DOH as well as the topographic survey. Located on TMK 6-6-004:32 but serving Lot 16.
- Lot 15 TMK 6-6-4:16 – Registered IWS. Verified through DOH as well as the topographic survey. Located on TMK 6-6-004:16 and serving Lot 15.
- Lot 11 TMK 6-6-4:17 – Unregistered Sewer Box. Verified on topographic survey. Located on TMK 6-6-4:17 and appears to be serving Lot 11

The DOH has verified that nearly 100% of the project site is outside of the State's designated No-Pass Zone. The No-Pass Zone indicates areas where only 1 IWS is allowed per lot of record. Essentially, since the property is in the Pass Zone, the project could propose 1 IWS per 10,000 square feet of lot space.

Anticipated Impacts and Mitigation Measures

The use of IWS option was explored; however, the proposed flow quantity exceeds what DOH currently allows. Chapter 62 of Title 11, Hawaii Administrative Rules, entitled "Wastewater Systems" limits the amount of wastewater flow from a single development to 15,000 Gallons per day (GPD). The current projected wastewater flow for this development is about 40,000 GPD. An on-site wastewater treatment system is being proposed for the project. The proposed wastewater system design consolidates all the flow from the proposed development and directs it to an on-site wastewater treatment unit. The unit will be designed according to DOH standards. The wastewater treatment unit will produce R-2 Water (disinfected secondary reclaimed water) and will likely need to be monitored on a monthly basis. This water is suitable for subsurface irrigation, although it may not be cost effective for the project. Further treatment can bring the effluent status down to R-1 (significant reduction in viral and bacterial pathogens) and can be used for spray irrigation. However, the increase in system and maintenance/monitoring cost may not be economically feasible. Even if the treated water is used for irrigation, a seepage pit would still be necessary because the quantity of the daily treated water will likely exceed the daily irrigation water demand. Typically these types of systems are required to have a backup seepage pit. Therefore, two seepage pits are proposed in the parking area.

Drainage: According to the PER, the project site has a relatively minimal slope running along Kamehameha Highway. Behind the buildings, there is a natural slope that slopes away from the highway. There are currently no existing drainage facilities and no defined natural drainage ways from Kamehameha Highway to the back of the site where an existing retention basin accommodates both on and off-site runoff. There are six12-inch clay drain pipes directing off-site flow from the southwest corner onto the property and an 18-inch PVC drain pipe under Mahaulu Lane directing runoff from the northwest corner also onto the property. This runoff eventually finds its way to the retention basin. The existing condition attributes about 64.83 cubic feet per second (cfs) of on-site and off-site runoff to the existing retention basin. As the elevation exceeds 10.7 mean sea level (MSL), the runoff begins to backflow out the top side of the 18-inch PVC drain line. Mahaulu Lane drains to the northwest direction causing majority of the flow to end up on the upstream side of the 18-inch PVC line. Some surface flow from the site reaches Mahaulu Lane closer to Kamehameha Highway and flows across to the neighboring lot to the north. With the limited topographic survey available for the neighboring properties, it is uncertain how exactly the flow dissipates.

The runoff within the project site generally surface flows, as is the case for much of Hale'iwa due to the lack of underground drainage collection system. Many pondings tend to take place during the surface flow. A site visit during heavy rain showed significant ponding along the edge of Kamehameha Highway and caused storm flooding issues for current lessees. This exposes a legitimate need for drainage improvements for the project, specifically along Kamehameha Highway. The property frontage along Kamehameha Highway has an average natural slope of about 1.0% but varies between 0.2% and 2.25%. Majority of the lots fronting the highway have an average slope of less than 1.0% along their property lines.

The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) indicates that the project is located in Zone X, an area outside of FEMA's designated 500-year flood zone. Thus, there is minimal to no threat of serious riverine or coastal flooding for the project site.

Anticipated Impacts and Mitigation Measures

Storm water runoff from the site will be collected through area drains, ditches, and gutters, and transported through pipes toward the retention basin on the proposed Country District lot. The minimum required size for the retention basin based on the Rules Relating to Storm Drainage Standards January 2000, Department of Planning and Permitting, City and County of Honolulu is approximately 631.5 cubic yards. The existing retention basin has a capacity of approximately 556 cubic yards and will need to increase in volume to accommodate the increase in flow from the redevelopment project. The retention basin volume will also be increased to accommodate as much of the excess off-site runoff as possible. Based on the latest site plan, the proposed volume of the retention basin is approximately 1,482 cubic yards.

The runoff from Kamehameha Highway is proposed to remain within the City ROW and continue to flow south. With the possibility of widening the ROW, there should be adequate space for a swale to divert the runoff. Walkways adjacent the buildings will also slope toward this swale. Post-development flow quantity of the project will not exceed the pre-development quantity. Runoff from the roofs will be directed to the back of the buildings and diverted to the retention basin away from Kamehameha Highway. This will help reduce the amount of site runoff flowing to the ROW.

Best management practices will be used in the design of the drainage system. Low Impact Design elements such bioretention areas, vegetated swales, and pervious pavement will be incorporated to the extent practicable.

Roadways: According to the PER, Kamehameha Highway is a two-lane roadway within the City right-of-way (ROW) fronting majority of the project site and providing main access to the site. Other adjacent access to the project includes private driveways on-site on both the north and south boundaries (Mahaulu Lane and Kewalo Lane). The original ALTA Survey completed by Hawaii Land Consultants in 2009 and meetings with City and County of Honolulu Department of Planning and Permitting (DPP), Traffic Review Branch (TRB) have confirmed that this span of Kamehameha Highway is subject to future road widening under the Revised Ordinances Section 14-21.1 & 14-21.2 (also known as Ordinance 2412).

Anticipated Impacts and Mitigation Measures

The City evaluates implementation of Ordinance 2412 on a case-by-case basis. In some cases, requirements might be imposed on an infrastructure-need basis and other, larger developments, which requires offsite infrastructure improvements to support the proposed development, would likely be required to construct street frontage improvements as well. They also must consider maintaining the "small town" characteristics of Hale'iwa through policies in the North Shore Sustainable Communities Plan (NS SCP), Land Use Ordinance (LUO), and the Hale'iwa Special District.

If Ordinance 2412 were to be fully enforced, the entire span of Kamehameha Highway fronting the project (about 630 feet) would have a 60 foot wide right-of-way (ROW). This would include a 34 feet roadway "curb-to-curb" and 13 feet of shoulder on both sides. The 34 feet of roadway would allow for two (2) 12 feet lanes in either direction with a 10 feet turn lane down the middle. Sidewalk and curb & gutter improvements would also be required according to the City roadway standard along the full 630 feet project frontage along Kamehameha Highway.

Ordinance 2412 is also in conflict with the recently adopted 2010 NS SCP which calls for the preservation of Kamehameha Highway as a two-lane street to maintain the North Shore's rural character. The 2010 NS SCP also calls for rural streetscape design and development standards that are consistent with the rural character of the region which includes the use of grassed swales in place of raised sidewalks with curbs and gutters. This issue has been discussed with TRB and the Ordinance 2412 will not be imposed for the full project frontage but along the left-turn lane improvements ROW. Pedestrian walkways within the improved right of way will be dedicated to the City as an easement. KS is working closely with TRB, the City and County of Honolulu Department of Transportation Services (DTS), and State Historic Preservation Division (SHPD) on the roadway improvement alternatives to balance the traffic impact mitigations with pedestrian safety and preserving Hale'iwa town's rural character. As the project is in Hale'iwa Special District, the special district permitting and rezoning process may allow exemption on the standard curb, gutter and sidewalk.

Future traffic conditions were evaluated in the Traffic Impact Analysis Report (TMC, April 2011). The TIAR traffic mitigation recommendation to optimize future traffic flow is for the installation of left-turn lanes on Kamehameha Highway at the intersection with private roads serving the project at Kewalo Lane and Mahaulu Lane. This may or may not be possible depending upon several factors primarily dealing with the narrow right-of-way in Haleiwa town, very little setback for older

buildings along the roadway, and the community's desire to retain the historic character of Haleiwa town, as reflected in the North Shore sustainable Communities Plan. DPP-TRB and DTS have been consulted in the planning discussions for the possibility of installing a left-turn lane. The options for traffic mitigation involve multiple complications in terms of highway setbacks for existing and new buildings, threats to pedestrian safety, effects on historic buildings, and the possible need for off-site private property condemnation.

The zone change for the commercial redevelopment will determine if the project is required to comply with Ordinance 2412. Roadway improvements associated with the left-turn lane will have significant widening requirements. Due to the development of new commercial buildings at the southern end of the project area, the property setbacks and roadway widening to install a left-turn lane can be accommodated. The Kewalo Lane intersection also serves the adjoining Haleiwa Town Center, which is expected to have growing traffic volumes in the future. The new commercial frontage in this section of the project area will provide setback from the highway in compliance with the Ordinance.

The commercial redevelopment of the Matsumoto Shave Ice buildings and three other historic building in the northern portion of the project area will not allow for the Ordinance 2412 setbacks to be imposed. Several historic buildings would require demolition to satisfy the setback requirement.

The recommended traffic mitigation for installation of a left turn lane into Mahaulu Lane would encounter significant problems with pedestrian safety and partial demolition of historic buildings. The ideal ROW widening to accommodate the left-turn lane is not possible at the northern portion of the site due to widening encroachment on the existing historic buildings at Haleiwa Eats and Miura Store. The widening would also require land acquisition at neighboring properties, one of which includes a historic structure.

Four preliminary schemes are under consideration for highway widening to provide traffic mitigation, as summarized below. In these scenarios, efforts have been made to accommodate the requested improvements by DPP-TRB and DTS, along with Ordinance 2412 setbacks. The scenarios are being evaluated for their potential traffic flow benefits balanced with their anticipated impacts (pedestrian safety, historic building integrity, private property condemnation). A summary matrix in Table 2.1 presents the range of issues associated with each scenario. Scheme 1 is TRB's ideal case scenario, but it is the most infeasible scheme because of its extensive impacts to the existing historic buildings and the neighboring properties (Miura Building). Scheme 2 results in impacts to the existing historic buildings on KS and neighboring properties, although the impacts are less extensive than Scheme 1. The existing historic buildings' lanais would become part of the widened roadway shoulders which poses pedestrian safety concerns. *Appendix H - Road Widening Impacts to Historic Structures and Pedestrian Safety* provides illustrations of the impacts as a result of this scheme. Scheme 3 avoids a requirement for land acquisition at neighboring properties north of the project, impacts historic buildings, and potential effects to pedestrian safety along the property frontage. Scheme 4 reduces the encroachment on the historic buildings and/or their lanais but the lanais are still part of the ROW which does not eliminate pedestrian safety concern. Therefore, Scheme 3 is the preferred scheme because it provides some level of traffic mitigation with at least one dedicated left-turn lane to the project to relieve the left-turn flow while preserving pedestrian safety and integrity of the historic buildings.

	Scheme 1	Scheme 2	Scheme 3	Scheme 4
	Ord. 2412	Reduced Median Lane Width and Length at Mahaulu Lane	Left-turn Lane at Kewalo Lane Only and Separate Left-turn/Right-turn Out from Kewalo	Scheme 3+Scheme 2 Without Median Lane North of Mahaulu
Lane Widths				
Travel Lanes	12 ft	12 ft	12 ft	12 ft
Left-turn Lane	10 ft	10 ft	10 ft (Kewalo only)	10 ft
Median Shelter Lane	10 ft	10 ft (Kewalo) 9 ft (Mahaulu)	10 ft (Kewalo only)	10 ft (Kewalo only)
Shoulder	13 ft	13 ft (Kewalo) 8 ft (Mahaulu)	13 ft (Kewalo only)	13 ft (Kewalo) 8 ft (Mahaulu)
Smallest Pedestrian Buffer	~2 ft	~5 ft	~13 ft	~3 ft
Left-turn Lane Lengths				
Kewalo	80 ft	80 ft	100 ft	100 ft
Car Storage	4 cars	4 cars	5 cars	5 cars
Mahaulu	80 ft	50 ft	-	50 ft
Car Storage	4 cars	2 cars	-	2 cars
Emerson	40 ft	-	-	-
Car Storage	2 cars	-	-	-
Median Shelter Lane Lengths				
Kewalo	50 ft	50 ft	50 ft	50 ft
Mahaulu	80 ft	40 ft	-	-
Improve Level of Service (LOS)				
Kewalo	Yes	Yes	Yes	Yes
Mahaulu	Yes	Yes	No	No but reduce delay to northbound through traffic
Acquisition Requirements	Haleiwa Town Center frontage (~270')	Haleiwa Town Center frontage (~240')	Haleiwa Town Center frontage (~285')	Haleiwa Town Center frontage (~285')
	Properties North of Mahaulu Lane Frontage (~260')	Properties North of Mahaulu Lane Frontage (~150')	-	Properties North of Mahaulu Lane Frontage (~130')
Number of Impacted Historic Buildings	6	2 (North Yoshida Store's lanai and Miura Store's Building*)	0	2 (North Yoshida Store's lanai and Miura Store's lanai*)
Implications	Forces pedestrian ROW onto all of the historic buildings	Forces pedestrian ROW onto the historic building or lanai, requires relocation or alteration to Miura Building* store front	Limits pedestrian walkway hazard	Forces pedestrian ROW onto the historic building or lanai, requires relocation or alteration to Miura Building* store front, awning, and
	Pedestrian walkway hazard	Pedestrian walkway hazard	Preserve integrity of the historic buildings	Pedestrian walkway hazard
	Little buffer between pedestrians and vehicles along historic buildings	Little buffer between pedestrians and vehicles along historic buildings	Allow for rural streetscape design that are consistent with the rural character	Little buffer between pedestrians and vehicles along historic buildings
	Require raised curb to separate pedestrian from traffic	Require raised curb to separate pedestrian from traffic		Require raised curb to separate pedestrian from traffic

Note: *Miura Store is not owned by KS

Table 2.1 Road Improvement Scenarios Impact Matrix

2.12 SOCIO-ECONOMIC CHARACTERISTICS

Existing Conditions

The site is located near the coastal lowlands and popular North Shore beaches. Hale'iwa town serves as the main commercial center of the area. According to the 2000 Census, North Shore has a small population of approximately 7,699 people and 3,002 housing units in the Hale'iwa zip code 96712 area. The median age is 34 years with approximately 9 percent over the age of 65. Two out of three people are in the labor force. The median household income in 1999 was $49,583. The median family income in 1999 was $58,689. The dominant occupations of residents in the area involve education, health, and social services at 17 percent. Approximately 15 percent of the residents work in the areas of art, entertainment, recreation, accommodation and food.

Colliers Monroe Friedlander Consulting (CMFC) prepared a market study for commercial redevelopment in March 2011. Currently, there are approximately 280,000 square feet of retail inventory within the North Shore trade area. North Shore retail vacancy rates have been low over the past few years and available retail space still remains in short supply. The majority of the consumer expenditures and retail demand was generated by the transient market which is comprised of domestic and international tourists that travel to the North Shore for sightseeing, shopping and beach-going. The transient market generates roughly between 60 percent to 80 percent of retail demand. The local and the new resident market combined, generated an additional 20 percent of retail demand for Hale'iwa. The retail space demand for the area was projected at approximately 30,000 square feet. The current retail composition for Hale'iwa is heavily weighted towards the tourist/transient market segment. A large percentage of the region's sales are generated from the transient market. Consumer expenditures by the local resident markets are being spent outside the North Shore trade area. This creates a sizeable opportunity for retailers that target the local resident market. Recent broker interviews indicate there is a healthy interest from restaurants and retailers seeking to establish a presence in Hale'iwa.

Anticipated Impacts and Mitigation Measures

The proposed development will meet the demand for more retail spaces in Hale'iwa. The project will offer a complementary merchandising mix of retailers that targets a blend of consumer market segments. In addition to the transient market, this development will include a wider array of retail goods and services that appeal to the local resident market as well.

Development of the KS project is expected to result in positive effects on socio economic conditions. The project intends to improve the socio economic conditions through the provision of retail-related employments and generations of applicable County and State taxes. The project will create new employment opportunities directly and indirectly. New employees will be needed to operate the new retails and restaurants. Indirectly, the project will create short term employment related to the construction improvements to the project site. Long term, the project will not significantly impact the general labor and employment of the North Shore. No additional socio-economic mitigation actions are recommended.

2.13 HISTORIC AND ARCHAEOLOGICAL RESOURCES

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

Previous archaeological investigations have identified numerous historic properties in the immediate vicinity of the project area as shown in *Figure 2.5*, including: heiaus, springs, sacred stones, Loko'ea pond, a fishing shrine, and an altar (McAllister 1933).

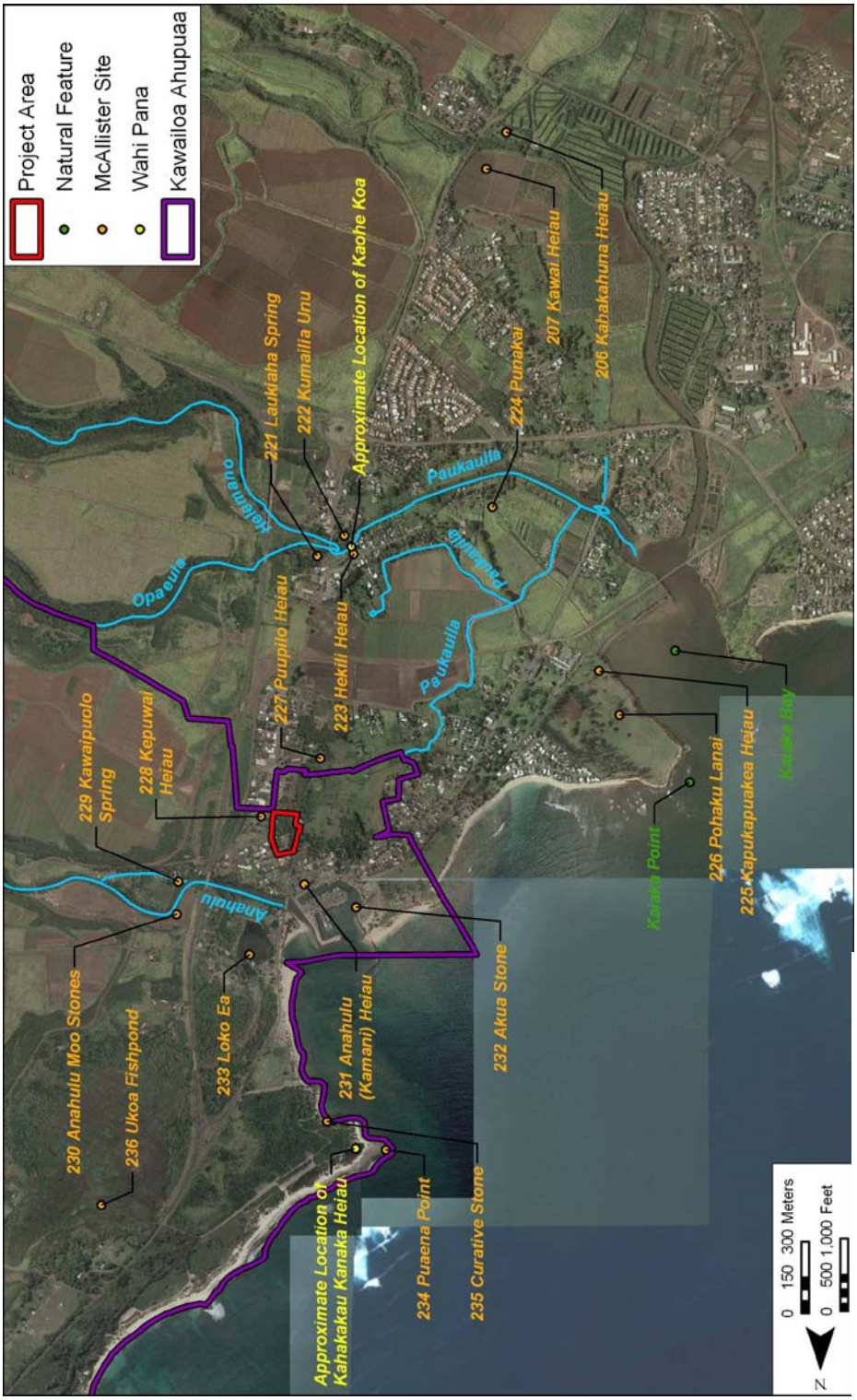
It is expected that remnants of pre-contact/early post-contact traditional Hawaiian use or habitation, including burials, may be found along the coastal portions of Pa'ala'a. This includes the project area, especially at the western half of the property where Jaucus sand deposits are intact. Evidence of post-contact use and disturbance of the project is expected, due to the proximity of the sugar cane fields, rice fields, railroad construction, and other nineteenth and twentieth century large-scale landscape transformation.

Two historic properties were documented during this project investigation. The sites consist of *lo'i* (irrigated pond-field) agricultural sediments (SIHP # -7151) recorded throughout the west half of the project area and five historic concrete foundations (SIHP # -7152 features A-E) located in the southern half of the project area, west of several historic buildings fronting Kamehameha Highway. The original function and use of these foundations is unknown. No inscriptions indicating dates of construction were observed on any of the concrete foundations. However, according to historic maps and background research, it is likely these foundations date to the early 19th century. Both sites are significant under Hawai'i Register Criteria D – Historic property has yielded or may be likely to yield information important in prehistory or history.

Eight historic structures are located in the project area fronting Kamehameha Highway (*Figure 2.6)*:

1. Yoshida Buildings, which includes the M. Yoshida Store-North (now Hale'iwa Eats) and the M. Yoshida Store-South (now Global Creations Art Gallery), 66-079 Kamehameha Hwy., Hale'iwa, HI 96712, ca. 1923, Honolulu C&C TMK #6-6-004-015
2. Matsumoto Store, which includes three separate structures, 66-087 Kamehameha Hwy., Hale'iwa, HI 96712, ca. 1904, 1945, Honolulu C&C TMK #6-6-004-016
3. House of Restoration Church, 66-107 Kamehameha Hwy., Hale'iwa, HI 96712, ca. 1958, Honolulu C&C TMK #6-6-004-017
4. Aoki Store and 'Iwa Gallery, 66-079 Kamehameha Hwy., Hale'iwa, HI 96712, ca. prior to 1927, Honolulu C&C TMK #6-6-004-015

All of these buildings, except the church, are currently listed as significant historic structures within the Hale'iwa Special District (*Figure 2.7*). Kamehameha Schools will undertake an Architectural Inventory Survey (AIS) for the above historic structures in accordance with the SHPD's requirements. The final AIS will include an overall historic context and significance for the area and individual architectural inventories for the eight historic buildings in the above mentioned properties. This study will take place over the summer of 2011 by the Heritage Center at University of Hawaii at Manoa School of Architecture (UHSOA) under the supervision of Spencer Leineweber, FAIA, director of the Heritage Center and Graduate Chair of the UHSOA.



Source: Cultural Surveys Hawaii, Inc.

Figure 2.5 Previously Identified Historic Properties within the Project Vicinity

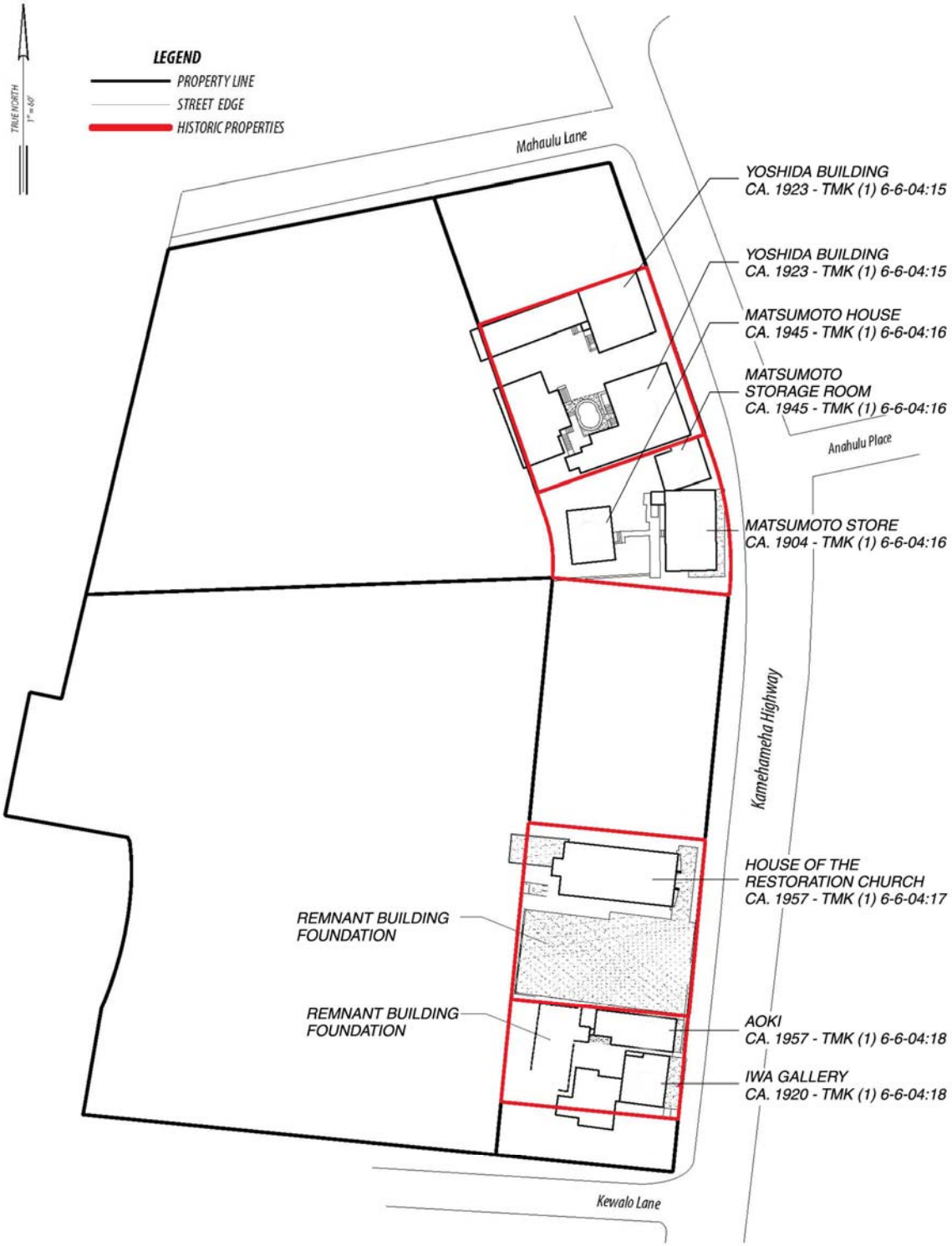


Figure 2.6 Historic Structures within the Project Area

Figure 2.7 Historic Buildings within the Project Area Listed as "Significant" under Hale'iwa Special District

Anticipated Impacts and Mitigation Measures

The proposed project will affect historic properties determined as significant under the Hawaiʻi Register criteria. Ground disturbing activities related to installation of the project utilities is likely to impact SIHP # -7151 (loʻi sediment). The proposed parking lot area is likely to impact SIHP # -7152 (concrete foundations). 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 the known documented historic properties or any yet unidentified archeological features within the project area, the project development will proceed under an archaeological monitoring program. An archaeological monitoring program would facilitate the identification and treatment of any burials and/or non-burial archaeological deposits, including SIHP #'s -7151 and -7152, that might be discovered during project construction. The monitoring program would also provide further information on the distribution and nature of the sites documented during this investigation. The specifics of the monitoring work will be specified within an Archaeological Monitoring Plan for the review and approval of the SHPD prior to project construction.

The high level architectural documentation being conducted for the historic buildings will be used to recreate the architectural style of the buildings that will be demolished, i.e. Aoki's and Iwa Gallery, in the new buildings. This will help document and preserve the 20th century wooden commercial buildings' architectural style, which are disappearing, and the Haleʻiwa town's rural commercial character.

Kamehameha Highway road widening will also affect some of the historic buildings, within the project property and on the neighboring properties. Physical barriers that may be required for pedestrian safety as a result of the roadway improvements in Schemes 1, 2, and 4 will significantly alter the character of the historic buildings and the Haleʻiwa town itself. Therefore, roadway improvements Scheme 3 which has the least impact on the integrity of the historic buildings and the Haleʻiwa town's character will be the most preferable alternative.

2.14 CULTURAL RESOURCES

A Cultural Impact Assessment (CIA) was completed for the project by Cultural Surveys Hawaii, Inc. in March 2011. A copy of the full report is included in *Appendix G*. Hawaiian organizations, agencies, and community members were 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.

The project is located in the makai portion of the Kawailoa Ahupuaʻa according to the United States Geological Survey (USGS) and the Office of Hawaiian Affairs (OHA) maps. Kawailoa Ahupuaʻa is adjacent to Paʻalaʻa Ahupuaʻa, which historic maps designate project site boundary within. The surrounding project area is also often referred to as Paʻalaʻa after Paʻalaʻa Subdivision that was built in this area in 1915. The historic background of the project area, therefore, includes aspects of both Paʻalaʻa and Kawailoa Ahupuaʻa.

The makai portion of both ahupuaʻa was once abundant in taro cultivation. Waialua means "two waters" which refers to two large stream drainages that once irrigated the taro fields in Kamananui, Paʻalaʻa, and Kawailoa Ahupuaʻa. Kawailoa and Paʻalaʻa Ahupuaʻa were significant in pre-contact Oʻahu. Many cultural sites were recorded in Paʻalaʻa Ahupuaʻa; including heiaus, fishing shrine, priest residence, and Laukīʻaha Spring. There are two spring-fed *loko puʻuone* in Haleʻiwa*:* ʻUkoʻa Pond and Loko Ea which have been used to cultivate fish in the pre-contact times. Waterbirds have been known to use the ponds as their habitats.

Beginning in the early 1800s, the sandalwood trade initiated economic and cultural transformations in Waialua Moku. The demands for the wood caused many taro fields to become fallow. The sandal wood trade collapsed in the 1830s and the whaling enterprises started to emerge in Waialua. From the 1840s into the early 1860s the Hawaiian economy focused on supplying whale ships during their long layovers. In the later half of the 1800s, Chinese immigrants began to cultivate rice in areas that taro had once thrived. Rice continued to be cultivated in the Waialua District and other areas within the Hawaiian Islands in the 20th century, and declined during the decades leading up to World War II. Sugar industry and tourism later flourished in Waialua. Haleʻiwa Hotel continued to operate in the first decades of the 20th century and was the center for social activities for prestigious guests. The hotel was taken over by the U.S. Army in the 1930s, serving as recreational center for military personnel in Haleʻiwa during World War II.

Kuleana Awards for individual parcels within the ahupuaʻa of Paʻalaʻa were granted in 1850. These Land Commission Awards (LCAs) were presented to tenants—native Hawaiians, naturalized foreigners, non-Hawaiians born in the islands, or long-term resident foreigners—who could prove occupancy on the parcels before 1845. Of the Kuleana Claims made in Waialua District only, there were 77 claims made for Paʻalaʻa; 64 of these were awarded. The Paʻalaʻa and Kawailoa kuleana parcels form a broad cluster around the project area. *Figure 2.8* shows kuleana parcels surrounding the project site. Information from Māhele documents indicates that the majority of parcels in the Paʻalaʻa-Kawailoa coastal taro lands comprise taro loʻi (irrigated fields) with associated house lots.

The project site was used for sugar cultivation until residential use around the 1930s. The Ohama family used the parcels for a gas station and residential occupation until around 1954. The City and County of Honolulu established Haleʻiwa Town as the Haleʻiwa Historic, Scenic and Cultural District in 1984.

Interviews indicate that kamaʻāina describe the project area as having cultural and historical significance. Kamaʻāina also maintain a strong connection to the environs surrounding the project area by lived experiences with its ocean and freshwater resources. The area was once abundance with goby, freshwater shrimp, clams, crayfish, and mullet until the water quality has declined. The area is also once well known for its abundance in plants that are valuable resource for food, medicine, and other uses, which now have diminished. Birds are another important cultural resource in the area, especially ʻalae ʻula, an endemic waterbird, which is found near the project area in the freshwater marsh. Peacocks and wild turkeys were also abundant and were hunted. The area is also well known for its recreational and fishing sites (along Anahulu River) and for its surfing traditions. Kamaʻāina also raised concerns about pedestrian safety related to walking along and crossing Kamehameha Highway.

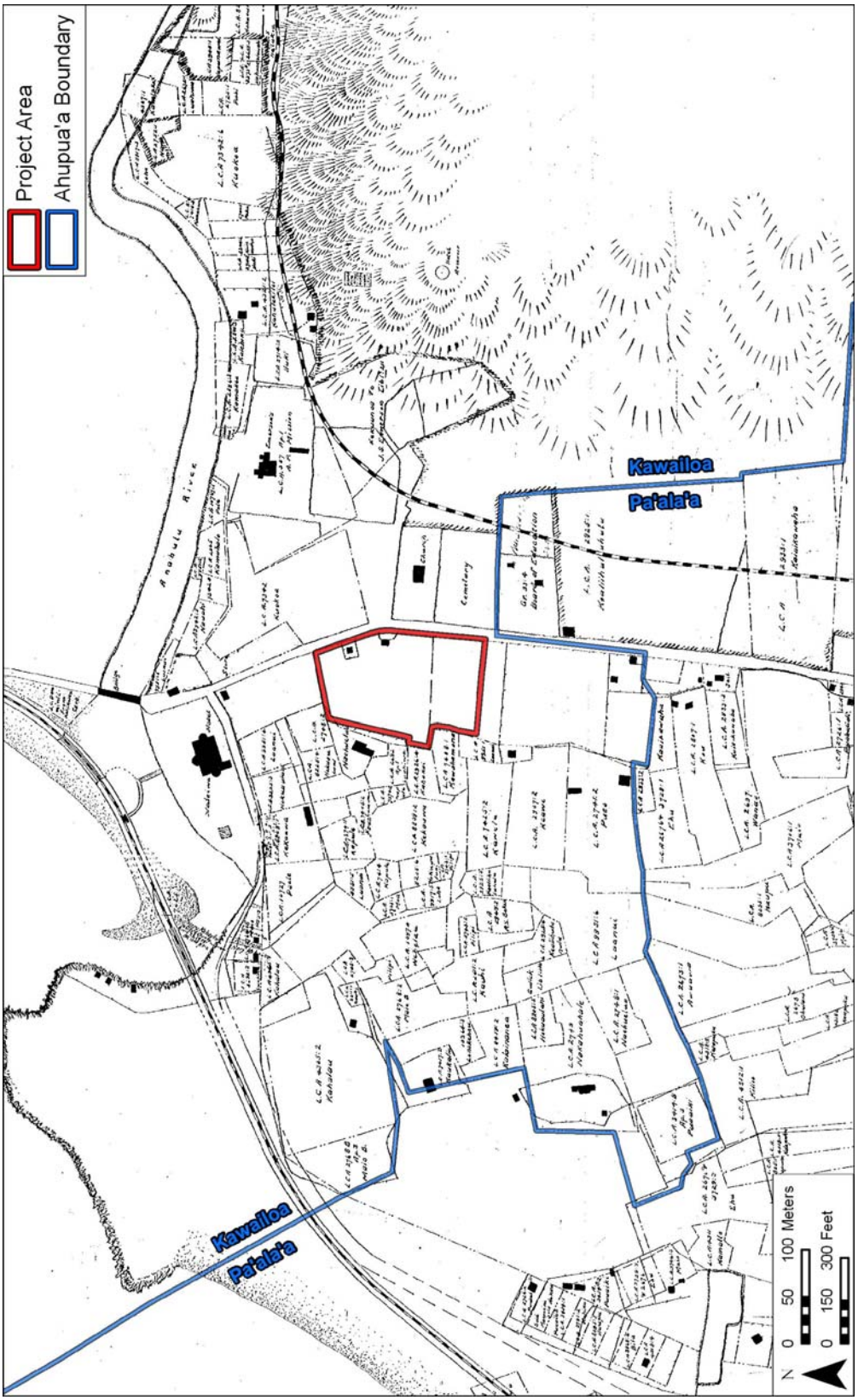


Figure 2.8 Land Commission Award Parcels in the Project Vicinity

Anticipated Impacts and Mitigation Measures
No 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 are anticipated. However, pre- and post- contact cultural resources, including evidence of habitation, agricultural sediments and burials have been documented within the project vicinity. Therefore, should cultural materials including burial sites, artifact, and subsurface cultural layers be identified during ground disturbance, all work in the immediate area should cease and the appropriate agencies pursuant to applicable law should be notified.

KS will continue to work with the community to raise awareness of the significant cultural and environmental resources in the vicinity of the project area. KS is committed to care for theses resources due to their importance to Hawaiian culture and the unique biodiversity of the area.The Anahulu River has been documented as an important resource for the community. Best management practices will be implemented during construction to mitigate impacts to the river and larger bay area.

KS is making efforts to preserve and enhance the cultural aspects of this property through this project. Community members will be kept informed of the project's progress. The project will comply with the Hale'iwa Special District Design Guidelines to preserve the rural scale and character of the area. Design elements that preserve such characteristics such as non-elevated walkways will be used. Cross walks will also be provided for pedestrian safety. Two access easements will be designated as part of the project's subdivision process to ensure right of access for kuleana parcels located behind the property- LCA 7408:1, LCA 9951:1, LCA 2926:4 and LCA 2692.

2.15 Visual Resources

Existing Conditions
The project site is located in the Hale'iwa Special District. According to the North Shore Chamber of Commerce the creation of the Hale'iwa Main Street Program in 1989 was closely linked with the designation of Hale'iwa Special District in 1984 which intended to perpetuate and enhance the rural character of the existing community by regulating physical design of all new developments. The late 1800's rural plantation town character within the Hale'iwa Special District is a significant visual resource of the project site. The existing views from the property consist of the surrounding residential neighborhood, neighborhood commercials, and Wai'anae mountain range as displayed in *Figure 2.9.*

Anticipated Impacts and Mitigation Measures
The proposed project will have a positive visual impact on the area. Portions of the project site fronting Kamehameha Highway are currently being used as parking lots. The Hale'iwa Special District Design Guidelines encourage pedestrian-oriented commercial activities and continuity of the street and require that off-street parking and loading areas be located at the side and rear of the buildings. The building designs will also comply with the Hale'iwa Special District Design Guidelines. Thus, the proposed improvements will enhance the appearance of Hale'iwa historic and rural plantation town character. New landscaping will also be installed to improve visual character of the project site. See *Figure 2.10* for conceptual rendering of the proposed project.

View of the project site from Kamehameha Highway

View of the project site and Wai'anae Mountain range from Kamehameha Highway

View of the project site and surrounding residential neighborhood and neighborhood commercials from Kamehameha Highway

Figure 2.9 Visual Resources

Figure 2.10 Hale'iwa Commercial Redevelopment Project Conceptual Rendering

2.16 SOLID WASTE AND HAZARDOUS MATERIALS

Existing Conditions

The proposed project requires demolition of the existing Aoki Shave Ice store, 'Iwa Gallery, and the House of Restoration Assembly of God Church. The other commercial buildings in the project area will be preserved and renovated.

A demolition and renovation-specific sampling and testing was performed by Masa Fujioka and Associates (MFA) in July 2009 at Matsumoto Store and storage, Aoki Shave Ice, and 'Iwa Gallery. MFA sampled building materials for the presence of asbestos, arsenic, Polychlorinated Biphenyls (PCBs), and the presence of lead paint. The testing result confirmed that none of the sampled materials contain asbestos. Two interior paint samples from Matsumoto Store's storage, bathroom, and kitchen contain greater than 0.5% lead which is classified as "lead-based" paint according to the U.S. Department of Housing and Urban Development (HUD)'s guidelines. Twenty paint samples from various exterior and interior locations of Matsumoto Store and storage, Aoki Shave Ice, and 'Iwa Gallery contain less than 0.5% lead which is considered "lead-containing" paint. Accessible lighting ballasts were examined and no "NO PCBs" labels were found. Therefore, fluorescent lighting ballasts encountered must be assumed to contain PCBs, and associated fluorescent light tubes must be assumed to contain mercury. Arsenic content was identified in two canec ceiling panel material samples collected from Matsumoto Store and storage and Aoki Shave Ice.

A single, abandoned above ground storage tank (AST) is located behind the Church. This tank has a capacity of approximately 300 gallons and likely held heating fuel oil for the Church. It is not known if the tank still has any contents.

Historical data indicates that several gas stations and/or automobile repair shops were formerly located on the property. Therefore, a subsurface geophysical survey was conducted by Global

Geophysics, Inc. in January 2011 to locate underground storage tanks (USTs) and fuel pipelines associated with these former facilities that may potentially still exist at the site. Such tanks, if present, may contain hazardous substances (e.g., gasoline, diesel, oil) and/or have released hazardous substances to the environment. The survey identified four potential USTs located in the parking lots for the Matsumoto and Aoki Shave Ice stores and in front of the Global Creation store. The survey also identified several limited areas where solid waste debris may be buried at the project site.

Anticipated Impacts and Mitigation Measures

Kamehameha Schools plans to conduct exploratory excavations to determine if USTs and buried debris are present at the project site. The AST, discovered USTs, and their contents will be removed from the property in accordance with applicable County, State, and Federal laws. Buried debris will also be removed and properly disposed of offsite.

In addition, the soil around all tanks will be inspected and tested for hazardous substances that may have been spilled or released from the tanks. Groundwater could also be adversely impacted from any potential releases of hazardous substances at the site. If detected, contamination will be removed from the property, or treated or managed in place, in a manner that is protective of human health and the environment for the planned use of the property in accordance with applicable laws.

There will be demolition waste and green waste from site clearing during the construction phase. After build-out, solid waste generated by operation activities on site will be collected and disposed at approved solid waste disposal facilities. Recycling of solid wastes will be accommodated and implemented to the extent practicable. Solid waste systems will be designed to comply with the applicable State and County requirements. Prior to demolition and/or renovation of existing structures that have not been tested, building materials will be sampled using destructive sampling protocols to collect representative samples for asbestos, lead paint, and arsenic analysis. Removal and disposal of solid waste and hazardous materials will be performed in accordance with applicable County, State, and Federal laws.

2.17 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 Hale'iwa Commercial Redevelopment Project is not anticipated to generate substantial cumulative impacts. An on-site wastewater treatment system will handle all of the wastewater generated from the redevelopment project. Expansion to the existing retention basin will accommodate on-site stormwater runoff as well as some of the off-site runoff. The projected traffic impact for year 2014 is noticeable from left turning into the off-site parking lot from Kamehameha Highway through Kewalo Lane and Mahaulu Lane. Several roadway scenarios have been studied in consultation with the City (DPP-TRB and DTS) to mitigate the anticipated traffic impacts. Each alternative roadway improvement scheme is currently being evaluated for its feasibility, impacts to the historic buildings, pedestrian safety, and Hale'iwa town's rural character.

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. Significant secondary impact is not anticipated in association with the proposed redevelopment.

3.0
ALTERNATIVES TO THE PROPOSED PROJECT

3.0 ALTERNATIVES TO THE PROPOSED PROJECT

The following provides discussion of the alternatives to the proposed project. The alternatives evaluation will be in the context of the project's objectives as described below.

- Meet present market demand of visitors and local residents by providing a balance mix of businesses
- Create a positive economic return on investment and increase the long-term lease rent revenue from this asset
- Preserve the rural main street character of historic Hale'iwa Town
- Improve pedestrian connectivity and safety and improve traffic flow
- Seek to minimize and mitigate adverse impacts of development on the area's natural, cultural, social and economic environment through sound development planning and improvements to existing utilities and infrastructure
- Bettering the whole of Hale'iwa as part of the overall North Shore community

These objectives must be satisfied for the project to be economically viable and socially and environmentally responsible. For this Environmental Assessment (EA), four alternatives to the Proposed Action include the following: 1) No-Action Alternative, 2) Residential Development Alternative, 3) Redevelopment Alternative Without Gross Leasable Area Expansion, and 4) Maximum Commercial Redevelopment under LUO Allowance.

3.1 NO-ACTION ALTERNATIVE

The No-Action Alternative examines the scenario whereby the existing facilities and infrastructure would largely remain in the same scale and existing conditions. Under this alternative, none of the planned improvements would be realized. The No-Action alternative would result in the continued use of the land as non-conforming commercial uses. No site disturbance and impacts from construction would occur. Buildings and existing wastewater disposal systems will not be upgraded to meet current applicable codes. Older structures will continue to require maintenance. Upgrades to these buildings, for other than health and safety issues, cannot be performed under the current residential zoning. Without the rezoning and a major commitment to redevelop the properties, it is likely that the current buildings would fall into further disrepair over time. Pedestrian safety and traffic flow problems from multiple site access points would continue. There will be no expansion of businesses to capture market demand in this alternative. Visitors' and local residents' needs would not be met. Positive economic return on investment and increase in lease rent revenue would not result. The Hale'iwa town corridor will not be improved. However, there will be no increase in infrastructure demand under this alternative.

3.2 RESIDENTIAL DEVELOPMENT ALTERNATIVE

The majority of the project site is currently zoned R-5 (Residential District) and AG-2 (General Agricultural District). Alternative to the proposed project would be to the development of the site as a residential and agricultural development.

R-5 zoning allows for a minimum lot size of 5,000 sq. ft. and AG-2 zoning allows for one dwelling unit per a minimum of two acres. With approximately 49,000 sq. ft. of R-5 zoned lands and 2.76 acres of AG-2 zoned lands, this property could create up to 10 new home sites. The houses would be built as two-story for greatest market value. The two-story structures would have a greater visual impact than the proposed one-story development. Construction and site development impact from this alternative would be short term in nature. Pedestrian connectivity would not result. In comparison with the proposed project, this alternative action could potentially generate less water use, wastewater, and traffic.

Moreover, the project site has long been used for commercial activities, and has become a "landmark" of the community. The North Shore Sustainable Communities Plan Land Use Map designated the project area as "Country Town". Such designation indicates small-scale and compact commercial uses. Matsumoto and Aoki Shave Ice are well-known commercial attractions that attract visitors to Hale'iwa, creating positive economic impacts to the local community. Many commercial buildings on the project site are also "significant historic structures" according to the Hale'iwa Special District. This alternative would require demolishing these historic commercial buildings in order to build new residential units. Thus, this alternative is not in compliance with the North Shore Sustainable Communities Plan and the Hale'iwa Special District. Residential development under this alternative would not meet market demand for more retail space on the North Shore. There will be no expansion of businesses to better serve visitors and local residents. The market study also shows that residential development on this property will not yield positive economic return on investment. The rural main street character of historic Hale'iwa Town would not be preserved under this scenario.

3.3 REDEVELOPMENT ALTERNATIVE WITHOUT GROSS LEASABLE AREA EXPANSION

A potential alternative use of the property could involve the use of the site "as-is", with renovation of existing buildings and infrastructure upgrades. Non-conforming commercial uses would continue under this alternative. Multiple site access points and pedestrian queuing along and crossing Kamehameha Highway issues will not be addressed. Therefore, better traffic flow along Kamehameha Hwy and improved pedestrian safety would not result from this alternative. Community gathering place will not be created. There will be no expansion in retail space to capture market demand in this alternative. Visitors' and local residents' needs would not be met. Construction and site development impact from this alternative would be minimal and short term in nature. Although, positive economic return on investment and increase in lease rent revenue could result from the improvements, but existing tenants will have to absorb all of the improvement costs. Therefore, this alternative may not be feasible. Improvements to the rural main street character of historic Hale'iwa Town and the property as part of the overall North Shore community would be limited.

3.4 MAXIMUM COMMERCIAL REDEVELOPMENT UNDER LUO ALLOWANCE

The project area's designation as "Country Town" under the current North Shore Sustainable Communities Plan could potentially allow rezoning of the whole 4.22 acres property to Neighborhood Business District (B-1). The total Gross Leasable Area (GLA) under this scenario would be much greater than 30,000 SF. Business expansion would meet visitors' and local

residents' needs. Pedestrian connectivity and safety improvements will be realized. However, the development will exceed the market demand for retail space on the North Shore and may not yield a positive economic return on investment. Traffic impact, impact from construction and site development, and demand on public infrastructure would be the greatest of all scenarios. As the whole site would be developed, the impact to the environmental and biological features on the property would be much greater. The scale of the development would also change the main street character of historic Hale'iwa Town.

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4.0
APPLICABLE ENVIRONMENTAL AND LAND USE POLICIES AND PLANS

4.0 APPLICABLE ENVIRONMENTAL AND LAND USE POLICIES AND PLANS

In this chapter, 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.

Federal

- Americans with Disabilities Act (ADA)

State of Hawai'i

- Hawai'i State Plan
- State Land Use Law (Chapter 205 HRS)

City and County of Honolulu

- General Plan
- 2010 North Shore Sustainable Communities Plan
- Land Use Ordinance (Chapter 21 ROH)
- Ordinance 2412 (Chapter 14 ROH)
- Hale'iwa Special District Guidelines

4.1 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 statue 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.

4.2 HAWAI'I STATE PLAN

The Hawai'i State Plan establishes a statewide planning system that provides goals, objectives, and policies which detail property directions and concerns of the State of Hawai'i. Priority guidelines relating to the economy, housing, population growth, facility systems, and the physical environment will be discussed as they relate to the proposed project.

It is the goal of the State, under the Hawai'i State Planning Act (Chapter 226, HRS), 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

Specific objectives and policies of the State Plan that pertain to the project are as follows:

Section 226-8 Objective and policies for the economy—visitor industry.

(a) Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawaii's economy.

(b) To achieve the visitor industry objective, it shall be the policy of this State to:

(1) Support and assist in the promotion of Hawaii's visitor attractions and facilities.

(2) Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawaii's people.

(3) Improve the quality of existing visitor destination areas.

(4) Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.

(7) Foster a recognition of the contribution of the visitor industry to Hawaii's economy and the need to perpetuate the aloha spirit.

(8) Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawaii's cultures and values.

Section 226-12 Objective and policies for the physical environment--scenic, natural beauty, and historic resources.

(a) Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawaii's scenic assets, natural beauty, and multi-cultural/historical resources.:

(b) To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:

(1) Promote the preservation and restoration of significant natural and historic resources.

(2) Provide incentives to maintain and enhance historic, cultural, and scenic amenities.

(4) Protect those special areas, structures, and elements that are an integral and functional part of Hawaii's ethnic and cultural heritage.

Section 226-25 Objective and policies for socio-cultural advancement--culture.

(a) Planning for the State's socio-cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawaii's people.

(b) To achieve the culture objective, it shall be the policy of this State to:

(1) Foster increased knowledge and understanding of Hawaii's ethnic and cultural heritages and the history of Hawai'i.

(2) 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.

(3) Encourage increased awareness of the effects of proposed public and private actions on

the integrity and quality of cultural and community lifestyles in Hawai'i.
(4) Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawaii's people and visitors.

Discussion: The proposed project is consistent with the objectives and policies of the State Plan. The project will improve the quality and safety of the major 'Oahu "circle-island" visitor destination and foster aloha spirit. The commercial redevelopment will provide a well-designed facility that preserves historical architectural character and plantation history of the area. The project will serve as a gathering place for local residents and visitors where Hawaiian culture is perpetuated through local entrepreneurs, delicacies, artisans, and activities.

4.3 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. The proposed project is consistent with this Statute, as the proposed land uses are consistent with City and County of Honolulu General Plan, North Shore Sustainable Communities Plan (SCP), and Land Use Ordinance, as discussed below.

4.4 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 A: To promote employment opportunities that will enable all the people of O'ahu to attain a decent standard of living. Policy 1: Encourage the growth and diversification of O'ahu's economic base. Policy 2: Encourage the development of small businesses and larger industries which will contribute to the economic and social well-being of O'ahu residents. Policy 3: Encourage the development in appropriate locations on O'ahu of trade, communications, and other industries of a nonpolluting nature. Policy 4: Encourage the development of local, national, and world markets for the products of O'ahu-

based industries. Objective B: To maintain the viability of O'ahu's visitor industry. Policy 9: Encourage the visitor industry to provide a high level of service to visitors.

- PART III: NATURAL ENVIRONMENT. Objective A: To protect and preserve the natural environment. Policy 7: Protect the natural environment from damaging levels of air, water, and noise pollution. Policy 9: Protect mature trees on public and private lands and encourage their integration into new developments.

- 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. Policy 2 Encourage, wherever desirable, the rehabilitation of existing substandard structures.

- PART VIII: PUBLIC SAFETY. Objective B: To protect the people of O'ahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions. Policy 6: Reduce hazardous traffic conditions.

- PART X: CULTURE AND RECREATION. Objective B: To protect O'ahu's cultural, historic, architectural, and archaeological resources. Policy 2 Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.

Discussion: The proposed commercial redevelopment project promotes the objectives of the City and County General Plan by expanding employment and create business opportunities for low-impact, small local businesses. The redevelopment is expected to help maintain the viability of North Shore tourism industry by providing a high level of service to visitors and local residents through improved, safe, and high standard physical environment that preserves and restores the area's unique plantation architectural character. Mature trees on site are integrated into the design of the redevelopment. The design and construction of the project takes into consideration the impacts to the natural environment and the archaeological and cultural resources of the area.

4.5 CITY AND COUNTY OF HONOLULU – 2010 NORTH SHORE SUSTAINABLE COMMUNITIES PLAN (SCP)

The 2010 North Shore Sustainable Communities Plan was recently adopted. According to the 2010 North Shore Sustainable Communities Plan (NS SCP), the role of the North Shore in O'ahu's development pattern is to maintain the rural character, agricultural lands, open space, natural environment, recreation resources and scenic beauty of O'ahu'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.

Historic and Cultural Resources

- ***General Policies***: Specific policies that pertain to the project include 1) Emphasize physical references to North Shore's history and cultural roots to help foster the area's unique sense of place 2) Protect existing visual landmarks and support the creation of new, culturally appropriate landmarks 3) Preserve significant historic features from earlier periods 4) Retain, whenever possible, significant vistas associated with archaeological features 5) Respect significant historic resources by applying appropriate management policies and practices. Such practices may range from total preservation to integration with contemporary uses 6) Restore or keep intact sites with cultural and/or religious significance out of respect for their inherent cultural and religious values.

- ***Guidelines***: Specific guidelines that pertain to the project include 1) Implement in situ preservation and appropriate protection measures for sites that have high preservation value because of their good condition or unique, historic, cultural and archaeological features, and for which the State Historic Preservation Division has recommended such treatment 2) Determine the following on a site-by-site basis in consultation with the State Historic Preservation Officer: appropriate preservation methods; appropriate delineation of site boundaries and setbacks: and appropriate restrictions on uses and development of adjacent lands 3) Include input from all pertinent community resources in the development of a site preservation plan 4) Include sight lines and view planes that are significant to the original purpose and value of the site in criteria for adjacent use restrictions 5) Determine the appropriateness of public access on a site-by-site basis in consultation with the State Historic Preservation Officer, Hawaiian cultural organizations, and the owner of the land on which the site is located.

Discussion: An archaeological inventory survey was conducted for the project area to determine the potential for disturbance of any potentially significant archaeological and historical features. Archaeological monitoring will also be conducted during excavation activities. An Architectural Inventory Survey is also being prepared according to SHPD's requirements for the historic buildings within the project site. Access easements to kuleana lots will be in place to preserve access to Land Commission Awards (LCAs) parcels behind the project.

Commercial Areas

The 2010 NS SCP designated three categories of commercial uses: Country Town, Rural Community Commercial Center, and Country Store. The 2010 NS SCP land use map designates the project site within Country Town district (see *Figure 4.1*). The Country Town districts identify the general area where commercial establishments as well as public services and civic activities are concentrated. Country towns are generally distinguishable from their larger, often newer, urban counterparts by their compactness, small scale, and mixture of different land uses located in close proximity to each other. Buildings are usually one to two stories in height and built to the front property line. Commercial activity is often along the street frontage or in similar "main street" settings. Rural communities often take their identities from the character of their particular town center.

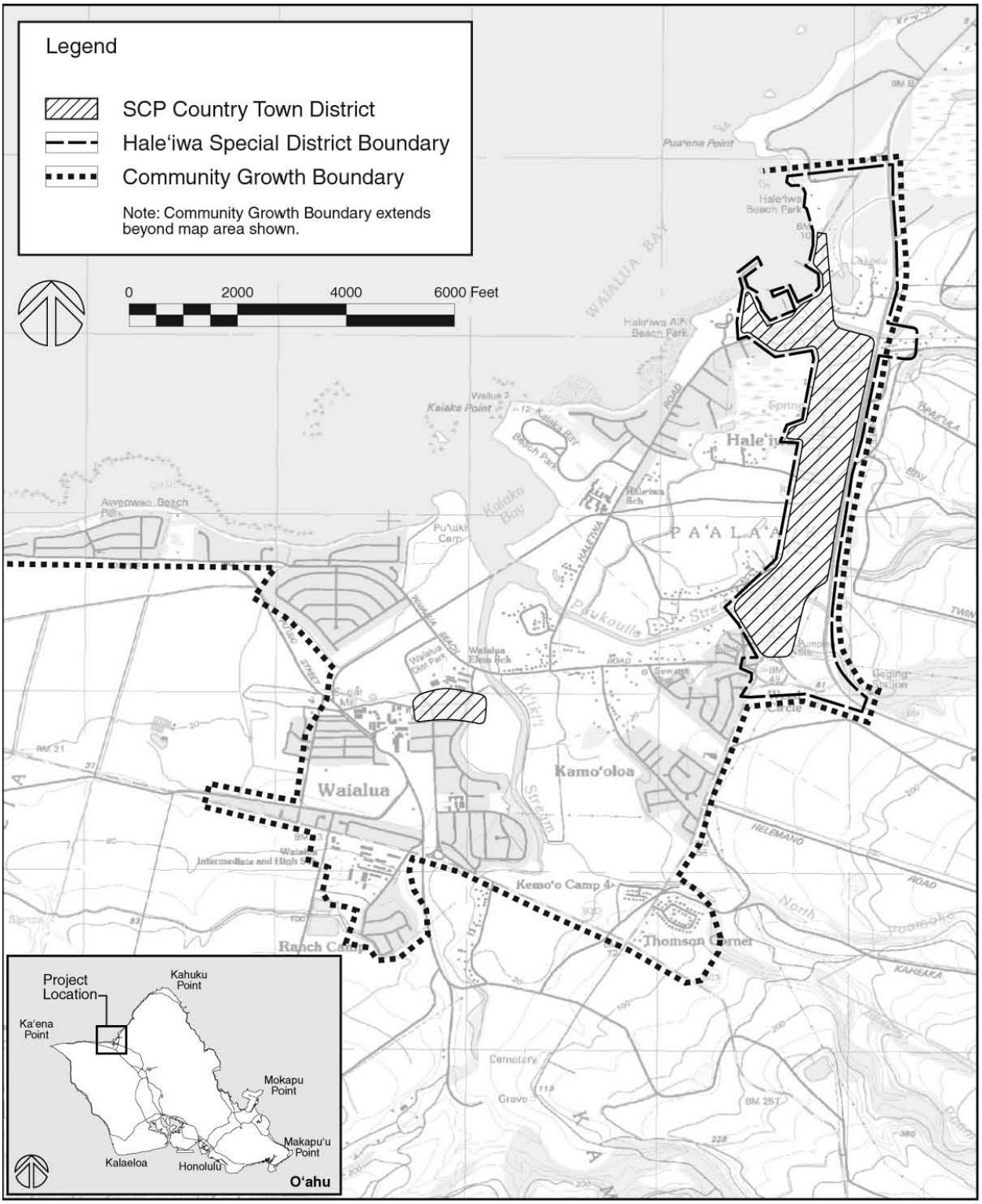

Figure 4.1 The 2010 North Shore Sustainable Communities Plan Hale'iwa and Waialua Country Town District

- ***General Policies:*** Specific policies that pertain to the project include 1) Maintain Hale'iwa and Waialua towns as the main commercial districts on the North Shore. Encourage landowners to invest in the physical and economic revitalization of the towns' commercial cores 2) Preserve and enhance the historic rural "small town" character complement the rural town context. Encourage multi-family housing (low-density apartment districts) and housing for resident senior citizens in close proximity to both Hale'iwa and Waialua town centers 3) Allow for a diverse range of civic, retail, office, and light industrial uses that meet the needs of residents and visitors 4) Support the continued viability of locally-owned small businesses, while prohibiting large commercial "big box" retailers that are contradictory to the region's rural character 5) Maintain the low-rise (one to two stories) human-scale and physical organization of buildings arranged along the traditional "main street" 7) Ensure that architectural and landscaping features are compatible with the rural character 8) Protect and enhance natural resources and ecosystems, such as wetlands and streams, fishponds, mature trees and open space areas, within the Country Town areas 9) Protect, preserve and – where feasible – restore historic and cultural features that reflect the North Shore's heritage and contribute to the town's identity.

- ***Guidelines:*** Specific guidelines that pertain to the project include 1) Limit building heights to two stories, and employ building design elements which reflect the architectural characteristics of the early 1900-period architecture identified in the Hale'iwa Special District Design Guidelines 3) Encourage commercial and related activities that are conducive to the pedestrian character to locate at the walkway level along Kamehameha Highway. Encourage less pedestrian-dependent and conducive activities (such as manufacturing areas for products and compatible light industrial uses, residences, services, etc.) to locate behind or above commercial activities so as not to detract from the commercial retail character of Kamehameha Highway 4) Focus the town's commercial core around a mix of compatible activities such as recreation, marine-related enterprises, farmers' markets, historic and cultural attractions, "clean" light industrial, small businesses and offices, civic and governmental services, businesses and retail activities for both residents and visitors 5) Upgrade drainage, wastewater, and water infrastructure within Hale'iwa town, as needed 6)
  Support home-based businesses and "Mom and Pop" type stores within the town center 7) Concentrate new development near existing built areas emphasizing redevelopment and infill along Kamehameha Highway, makai of the Hale'iwa Bypass Road (Joseph P. Leong Highway). Provide adequate landscaped buffer adjacent to the bypass 8) Ensure that commercial uses adjoining the Kamehameha Highway corridor include support facilities such as parking lots and restrooms that can adequately accommodate the planned commercial activities 11) Provide improved, expanded, and continuous pedestrian walkways linking commercial establishments within Hale'iwa, including connections between farmers' markets or other kinds of agricultural product and retail outlets, and open space and environmental resources (such as beach parks, Hale'iwa Harbor and Loko Ea Pond) 12) Enhance the attractiveness and general landscaped open space character of the area by providing roadway improvements, street trees, streetlights, street furniture, and signage compatible with the rural character of Hale'iwa town 15) Consolidate off-street parking to areas behind buildings, while retaining existing on street parking wherever possible and appropriate. As needed, parking should be rearranged to accommodate the pedestrian walkway system along Kamehameha Highway.

Discussion: The proposed project intends to apply for a zone change from R-5 (Residential District) to B-1 (Neighborhood Business District) for the commercial parcel. The B-1 (Neighborhood Business District) will be consistent with the 2010 North Shore SCP's long-range land use policy for the site. The new zoning designation will allow for a diverse range of civic, retail, office, and light industrial uses that meet the needs of residents and visitors while prohibiting "big box" establishments. The redevelopment will contribute to the physical and economic revitalization of the towns' commercial core and the project is an infill development of existing commercial establishments along Kamehameha Highway. The project will preserve and enhance the historic rural "small town" character with appropriate architectural and landscape design and the tenants of the project will primarily be locally-owned small businesses. Iconic and historically significant store structures will be preserved or recreated to maintain the town's identity. Walkways, as part of the street front improvements, will be provided along the storefronts while parking will be located behind the stores to create pedestrian oriented environment. Adequate parking and restrooms facilities will be provided to support the proposed redevelopment. Drainage and wastewater treatment system upgrade will be part of the proposed redevelopment.

Public Facilities and Infrastructure

Transportation Systems
According to the NS SCP, the only major arterial on the North Shore is Kamehameha Highway. Kamehameha Highway is a two-lane, scenic highway, which links North Shore communities with Central O'ahu and Ko'olau. The highway traverses the coastline from Hale'iwa through the communities of Kawailoa, Waimea, Pūpūkea, and Sunset Beach.

- ***General Policies:*** Specific policies that pertain to the project include 1) Retain Kamehameha Highway as a two-lane thoroughfare, to maintain the North Shore's rural character. Provide roadway improvements to promote pedestrian safety and traffic efficiency 4) Support a multi-modal transportation system to reduce automobile dependency. Provide more opportunities and support facilities for convenient and safe alternative modes of transportation, including bus, pedestrian and bicycle travel, and other modes of personal transportation 5) Ensure that existing regional roadways are adequate to accommodate proposed development proposals, prior to the construction of such developments.

- ***Guidelines:*** Specific guidelines that pertain to the project include 1) Establish rural streetscape design and development standards within residential areas consistent with the rural character of the region. These could include narrower streets, more landscaping, and grassed swales in place of sidewalks with curbs and gutters 12) Provide pedestrian-friendly walkways, off-street parking, bus pull-outs, tour bus maneuvering areas, and drainage improvements in Hale'iwa 13) Improve the main roadways within Hale'iwa and Waialua Country Town Districts with shade trees, landscaping, sidewalks, street furniture, and signage to promote pedestrian orientation within these country towns.

Discussion: The project will retain North Shore's and Hale'iwa's unique plantation era rural character with rural street frontage improvements, to the extent permitted considering requirements, using grassed swale and stamped wood plank concrete walkways. Road improvements which include dedicated roadway shoulder can accommodate pedestrian walkways and bicycle users. A Traffic Impact Assessment Report has been conducted for the proposed

development and appropriate roadway improvements will be implemented to mitigate impacts on regional roadways while maintaining the North Shore's rural character and providing utmost pedestrian safety. Off-street parking lot and tour bus drop off and parking area will be located within the property. Appropriate rural streetscape design and development standards will be implemented through landscaping, walkways, street furniture, attraction nodes and signage to promote pedestrian orientation.

Wastewater Treatment

- ***General Policies:*** 1) Provide adequate public and private wastewater treatment facilities and improve the existing wastewater management services on the North Shore to protect the North Shore's water resources and the health of the community is the highest priority 2) Support alternative wastewater technologies that reflect the community's values and rural character.

- ***Guidelines:*** 1) Use reclaimed water for irrigation and other uses, where feasible, in accordance with the Guidelines for the Treatment and Use of Recycled Water (May 15, 2002) by the State Department of Health and the No Pass Line established by the Board of Water Supply. A "wetlands" treatment system could serve as wild bird refuges that could also be used as a picnicking area and/or children's fishing park 2) Replace outdated individual cesspools with septic tanks and individual wastewater systems. Consider public programs or policies to support private conversion efforts.

Discussion: The existing cesspools and septic systems within the proposed project will be replaced with a new on-site wastewater treatment facility. Integration of a bioretention system which complements the surrounding rural character will be considered.

4.6 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 Residential District (R-5), Neighborhood Business District (B-1), and General Agricultural District (AG-2). A Change of Zone from Residential District (R-5) to Neighborhood Business District (B-1) and General Agricultural District (AG-2) to Country District is proposed to allow for conforming commercial uses and parking facility under a Conditional Use Permit (CUP).

The purpose of the business districts is to set aside areas for commercial and business activities to meet and support the economic growth of the city. These districts help to ensure a favorable business climate and support economic and social well-being of city residents. The intent of the Neighborhood Business District (B-1) is to provide small scale retail and business establishments

that service surrounding population. This district also applies to rural and urban fringe town centers that may or may not be located along major travel routes.

The purpose of the Country District is to recognize and provide for areas with limited potential for agricultural activities but for which the open space or rural quality of agricultural lands is desired. The district is intended to provide for some agricultural uses, low density residential development and some supporting services and uses. A parking lot is being planned on a portion of the project parcel proposed for Change of Zone from General Agricultural District (AG-2) to Country District. The remainder of the parcel will remain open space and will be used for on-site retention basin. This Change of Zone conforms to ROH's guidelines for identifying lands suitable for Country District as follows.

- The project area is within the state-designated urban district and designated as agricultural according to the city zoning ordinance
- The project area is not predominately classified as prime, unique or other under the agricultural lands of importance to the State of Hawai'i System
- Lands where a substantial number of existing parcels are less than two acres in size
- Lands where existing public facility capacities preclude more intense development

Parking facility is a permitted use in the Country District, subject to the submittal of a Conditional use Permit (CUP) application.

4.7 ROAD WIDENING ORDINANCE 2412

Ordinance 2412, or Chapter 14, Article 21 ROH sections14-21.1 and 14-21.2, indicates that land abutting any public street that is granted a change of zone from its present use classification to any use classification other than residential or agricultural uses is subject to general plan or development plan street setback and improvement requirements. Such improvements shall be in conformity with the general plan and development plans of the city. The City and County of Honolulu Traffic Review Branch has a planned road widening along Kamehameha Highway from Weed Junction to the intersection with Joseph P. Leong Highway.

Discussion: Under Ordinance 2412, the entire span of Kamehameha Highway fronting the project (approximately 630 feet) will need to be widened from two lanes to three lanes, providing a medial turn lane within a 60 feet ROW. This would include a 34 feet roadway "curb-to-curb" and 13 feet of shoulder on both sides. The 34 feet of roadway would allow for two (2) 12 feet lanes in either direction with a 10 feet turn lane down the middle. Sidewalk and curb & gutter improvements would also be required along the full 630 feet project frontage according to the City roadway standard. Ordinance 2412 is in conflict with the recently adopted 2010 NS SCP which calls for the preservation of Kamehameha Highway as a two-lane street and rural streetscape design that are consistent with the rural character of the region which includes the use of grassed swales and pedestrian-friendly walkways in place of raised sidewalks with curbs and gutters. Since some of the historic buildings will be preserved, the full widening and improvements required by Ordinance 2412 is not probable. This issue has been discussed with TRB and the Ordinance 2412 will not be imposed for the full project frontage but along the left-turn lane improvements ROW. Appropriate roadway improvement will be implemented to provide traffic impact mitigation,

pedestrian safety, and preserve the integrity of the historic buildings. Pedestrian walkways within the improved ROW will be dedicated to the City as easements. The Zone Change and the Special District permitting processes may allow for an exemption to the standards for curbs, gutters and sidewalks.

4.8 HALE'IWA SPECIAL DISTRICT GUIDELINES

The project is located within the Hale'iwa Special District and a Special District Permit will be required for the proposed project. The Special District guidelines are provided to guide aesthetic and architectural aspects of project development. The following describe areas where the proposed project conforms to the Hale'iwa Special District's objectives.

A. Preserve and enhance Hale'iwa's existing rural low-rise, human-scaled form and character, especially along Kamehameha Highway and Hale'iwa Road.
B. Preserve and restore to the extent possible buildings and sites of scenic, historic, cultural, and/or architectural significance, and encourage new development which is compatible with and complements those buildings, and sites, primarily through low building heights, appropriate period design features, and subdued materials.
E. Retain distinctive pedestrian oriented commercial area for residents and visitors.
F. Provide for safe and pleasant pedestrian and vehicular circulation, while avoiding parking areas along the streetscape.
I. Provide public improvements such as roadways, street lights, street furniture, and signage compatible with the rural character of the community, rather than at conventional urban standards.

Discussion: The project will comply with the Hale'iwa Special District guidelines. These will be fully discussed in the forthcoming Hale'iwa Special District permit application.

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5.0
DETERMINATION OF SIGNIFICANCE

5.0 DETERMINATION OF SIGNIFICANCE

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

5.1 ANTICIPATED DETERMINATION

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

5.2 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.

The subject lands are developed commercial area and agricultural lands which are currently being used as a base yard for an irrigation company. There are no significant natural resources on the subject lands. 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 redevelopment will not curtail the range of potential beneficial uses of the environment. The planned improvements are intended to provide a beneficial community use while resulting in a minimal loss of beneficial uses of the environment. There is limited existing wildlife habitat present on the site, and the project will implement environmentally-sensitive measures to address issues such as wastewater, 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 redevelopment 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 redevelopment project will improve the economic and social welfare of the community and State. The improvements will not negatively nor significantly alter the existing area, nor will it contribute to population growth. The action is also not expected to adversely affect traditional Hawaiian rights related to gathering, access, or other customary activities within the project area or its vicinity or any cultural practices or beliefs. Accesses to Kuleana lots will be preserved as dedicated access easements. The improvements will provide the community and visitors with a safe recreational and gathering space. The expanded commercial establishments will attract more visitors and therefore will be beneficial to the area's local ecomomy.

(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 project 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 long-term employment as a result of the retail and restaurant redevelopment will be beneficial to the local economy.

(7) Involves a substantial degradation of environmental quality.

The redevelopment will not substantially degrade environmental quality. Long-term impacts to air and water quality, noise levels, and natural resources would be minimal. The use of standard construction and erosion control best management practices will minimize the anticipated construction-related short-term impacts.

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

The commercial redevelopment project is not a commitment to a larger action, and will not promote substantial population growth. Instead, it is intended to partially fulfill local resident demands for more commercial establishments (especially restaurants) and gathering space.

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

There are no endangered plants or animal species located within the limits of the project site.

(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 redevelopment, improvements to the site and related infrastructure should not create detrimental impacts to air, water quality or ambient noise levels. On-site drainage system will ensure minimal 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 site is not 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. Small disconnected wetland areas on the site will be reestablished in drainage areas.

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

The redevelopment improvements will not affect scenic vistas or view-planes. The project is in Hale'iwa Special District and Hale'iwa Main Street program. The architectural design and landscaping of the project will comply with the Hale'iwa Special District Design Guidelines to preserve and enhance Hale'iwa's rural and plantation character.

(13) Require substantial energy consumption.

Construction of the project will not require substantial energy consumption relative to other similar projects. After the project is completed, energy will be conserved by using modern energy efficient appliances and fixtures, and application of green design concepts.

5.3 SUMMARY

As stated above, on the basis of significance criteria, the redevelopment project is not expected to have a significant impact on the local, County, or Statewide physical or human environment.

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

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6.0
LIST OF REFERENCES

6.0 LIST OF REFERENCES

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7.0
LIST OF AGENCIES, ORGANIZATIONS, AND INDIVIDUAL CONSULTED OR RECEIVING COPIES OF THE EA

7.0 LIST OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTED OR 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. The agencies' comments were acknowledged and addressed in this Draft Environmental Assessment. Also noted are individuals and organizations that have been consulted during the Environmental Assessment process.

Distribution	Pre-Assessment Consultation/ Recipient	Pre-Assessment Consultation Comments Received	Receiving Draft EA	Comments Received	Receiving Final EA/ FONSI
FEDERAL AGENCIES					
U.S. Fish and Wildlife	x	x	x		
STATE OF HAWAII AGENCIES					
Office of Environmental Quality Control	x	x	x		
Department of Business, Economic Development & Tourism (DBEDT), Office of Planning	x				
Department of Health Safe Drinking Water Branch	x	x	x		
Department of Health Clean Water Branch	x	x	x		
Department of Health Clean Air Branch	x	x	x		
Department of Health Wastewater Branch	x	x	x		
Department of Land and Natural Resources (DLNR)	x				
DLNR, Historic Preservation Division	x	x	x		
Department of Transportation	x	x			
Office of Hawaiian Affairs	x	x	x		
State Senator District 22	x				
State Representative District 46	x				
CITY AND COUNTY OF HONOLULU					
Board of Water Supply	x	x	x		
Department of Design and Construction	x	x	x		
Department of Planning and Permitting	x	x	x		
Department of Environmental Services	x				
Department of Facility Maintenance	x	x	x		
Department of Transportation Services	x	x	x		
Department of Community Services		x			
Fire Department	x	x	x		
Police Department	x	x	x		

Distribution	Pre-Assessment Consultation/ Recipient	Pre-Assessment Consultation Comments Received	Receiving Draft EA	Comments Received	Receiving Final EA/ FONSI
Office of the Mayor	x		x		
Council Member District 2	x		x		
LIBRARIES					
Waialua Public Library			x		
Hawai'i State Library			x		
CITIZEN GROUPS, INDIVIDUALS & CONSULTED PARTIES					
North Shore Neighborhood Board #27	x		x		
North Shore Chamber of Commerce	x		x		
Historic Hawai'i Foundation	x	x	x		
Haleiwa Town Center, LLC	x				
Kumpang and Ronald Soroos	x				
Morioka Family Trust	x				
Ming-Li Wang and David Robichaux	x				
Janet and Charles Fujimoto	x				
Wilma and Ronald Ward	x				
First Hawaiian Bank-Hale'iwa Branch	x				
Stanley and Noriko Matsumoto	x				
Cathy and Michael Aoki	x				
Wayne and Grace Shimamoto	x				
North Shore Trading Company, Inc	x				
Liliuokalani Protestant Church	x				
Hawaii Conference Foundation	x				
Adela Valmoja	x				
Marlene Abrigo	x				
Joel Asato	x	x			
Gladys Awai-Lennox	x	x			
Jan Becket	x				
Diane Canon	x				
Emmaline Causey	x	x			
Dino Harvest	x				
Butch Helemano	x				
Betty Jenkins	x				
Thomas Lenchanko	x				
O'ahu Island Burial Council	x	x			
Kunani Nihipali	x				
Henry Preece	x	x			
Waialua Hawaiian Civic Club	x	x			
Paul Sensano	x				
Thomas Shirai	x				
Janell Chun Silva	x				
John R Kaha'i Topolinski	x				
Owana Salazar	x				
Lavina "Maile" Agadar	x				

Appendices

Appendix A
WETLAND DELINEATION REPORT

Wetland delineation for TMKs (1) 6-6-004: 013-019, 027, 028, and 032 in Haleʻiwa, northshore Oʻahu

April 8, 2011 *AECOS* No. 1263

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Introduction

Kamehameha Schools is proposing to redevelop for commercial use several parcels (TMK (1) 6-6-004: 013-019, 027, 028, & 032) located along Kamehameha Highway in central Haleʻiwa, Oʻahu (Project; see Fig. 1). A January 21, 2011 site investigation by Group 70 International found two areas on the property suggestive of wetlands. *AECOS*, Inc. was contracted by Group 70[1] to investigate and delineate potential wetland areas as part of the planning process for the Project.

The March 2011 survey by *AECOS*, results of which are reported here, found two wetlands on the property. Standard wetland data sheets (Attachment 1) and recorded geospatial information using a handheld global positioning system (GPS) instrument (Trimble GeoXT) are presented in this report. An approximation of the wetland delineation is also provided. Attachment 2 is a copy of the relevant tax map.

Site Description

On the coastal plain more or less central to Haleʻiwa Town as it has developed south and west from the boat harbor at the mouth of Anahulu River occurs an approximately 10 ha (25 ac) freshwater wetland (Figs. 1 and 2). This wetland is fed by springs emerging from the limestone bedrock and was more extensive in

[1] This report was prepared for Group 70 for use associated with permitting. This document will become part of the public record of the permitting process.

the past, prior to efforts to control flooding by channelizing waterways, dredging, and filling areas in and around the wetland.

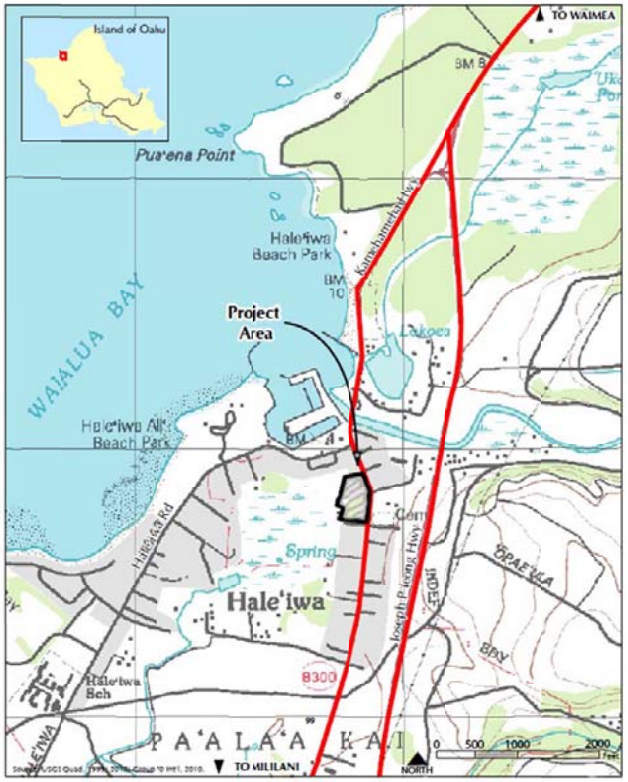

Figure 1. Project location on the Island of Oʻahu.

The National Wetland Inventory (NWI) map of the area (Fig. 2; USFWS, 1984) shows a 0.02 ha (0.05 ac) palustrine, unconsolidated bottom, permanently

flooded, excavated (PUBHx) wetland and a small portion of a 0.10 ha (0.26 ac) palustrine, unconsolidated bottom, permanently flooded (PUBH) wetland (blue, "freshwater pond" polygon in Fig. 2) located in the vicinity of the Project property. The map also shows the extensive palustrine, emergent, persistent/palustrine, scrub-shrub, broad-leaved evergreen, seasonally flooded (PEM1/SSC3) wetland (light green, "freshwater emergent" polygons in Fig. 2) located off property to the west.

Figure 2. National Wetland Inventory map of coastal plain at Hale'iwa.

According to a project site survey report by Group 70, "… the entire site is highly disturbed. Topography has been altered and soil profiles have clearly been disturbed. Site drainage has also been altered … The tree canopy is very dense and there is little understory vegetation except in smaller open patches. Here alien grasses and bushes dominate…"

After visiting all of the Project parcels, *AECOS* wetland scientists settled on three potential wetland areas and these were designated in the field as Areas A, B, and C (Fig. 3). However, it became apparent during the survey that these areas were part of a more or less connected, very shallow ditch running the full length of the west side of the Project parcels and connecting at the north end to a remnant portion of the "freshwater pond" wetland shown by USFWS in Fig. 2. The latter is now reduced to a short segment along the north Project boundary (parallel with Mahaulu Lane) and a pond 100 ft west of the Project parcels and visible in Fig. 3.

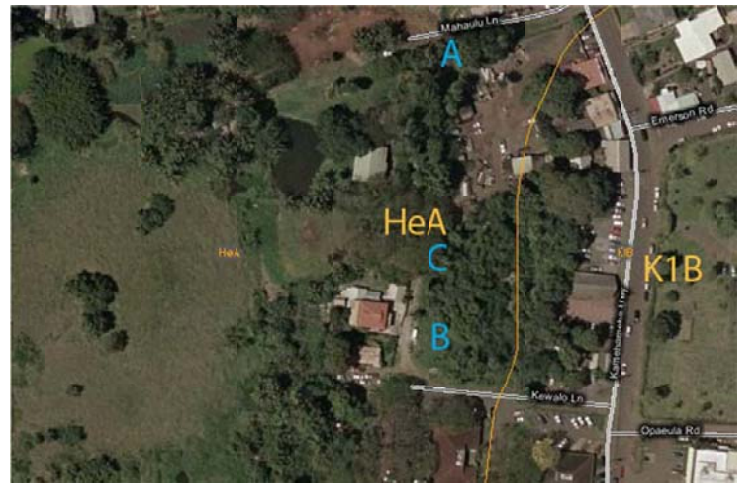

Figure 3. Soil map of Hale'iwa (from Foote et al., 1972) and areas of investigation: "A", "B", and "C", all within soil type mapped (orange line) as "HeA" or Haleiwa silty clay on 0 to 2 percent slopes.

AREA A - Area A is essentially the remainder[2] of the freshwater pond (PUBH wetland) shown in Fig. 2. The southern edge of this feature has relatively steep banks, because of material placed outside the wetland or ditch to limit overflowing to the south into a light industrial area. The berm of Mahaulu Lane

[2] On parcels TMK (1) 6-6-004: 027 & 032; an open pond is still present off-site farther west.

forms the north bank. Water in the ditch drains away to the north through a private drain pipe under Mahaulu Lane.

Area A has a dense overstory of Java plum (*Syygium cuminii*) and date palms (*Phoenix dacylifera*) and a thin understory consisting of nephthytis vine (*Syngonium* cf. *podophyllum*) and scattered umbrella sedge (*Cyperus involucratus*) growing in the wet areas (Fig. 4). Shallow, standing water was present during our survey and excavated soils were black and had emitted an odor of hydrogen sulfide.

Figure 4. Close-up photograph of soil pit A1, showing organic peat and nephthytis vine (right) and umbrella sedge (left).

AREA B - Area B is a shallow basin that receives runoff via culverts under Kewalo Lane from a parking lot south of the Project property. Trees are absent in Area B and the vegetation is dominated by para grass (*Urochloa mutica*) and wedelia (*Sphagneticola trilobata*), with Indian fleabane (*Pluchea indica*) present in some slightly elevated areas along the margin and in a line across part of the middle. Guinea grass (*Panicum maximum*) otherwise dominates the west and

south margins. The soil was saturated in Area B during the site visit in March and the ground surrounding had a layer of quarried, blue-rock gravel underlaying shallow soil.

AREA C - Java plum dominates the overstory in Area C and scattered *koa haole* (*Leucaena leucocephala*) and strawberry guava (*Psidium cattleianum*) saplings are present. Understory is largely absent due to shading, but Guinea grass (*Panicum maximum*) and various vines are abundant in places.

Indicators of hydrology were present in Area C during the March 2011 survey, primarily saturation in the upper 30 cm (12 in) and redox concentrations along root channels, but the soils and vegetation were not hydric. This area is likely intermittently flooded and conveys runoff water from the parking lot south of Kewalo Lane, through Area B to Area A, where a drain pipe directs the runoff into a ditch running north the west around an adjacent house lot parcel on Mahaulu Lane. Some parts of Area C have been filled with blue-rock gravel and sand.

Wetland Delineation

The field investigation followed methods detailed in the *Corps of Engineers Wetland Delineation Manual* ("Manual"; USACE, 1987) and the *Interim Regional Supplement* (USACE, 2010). The wetland status of plant species assigned by the B. P. Bishop Museum (Puttock and Imada, 2004; see also Erickson and Puttock, 2006) was utilized for plants not listed in the official list (Reed, 1988).

Under ordinary circumstances, establishment of a jurisdictional wetland requires positive wetland indicators for hydrology, soils, and vegetation. The boundary between wetland and upland is established as a line outside of which one or more of the three indicators is not present. In practical terms, this boundary is a judgment call based on establishing clear differences for both sides and then selecting a boundary that represents the sharpest line that can be drawn through what are typically gradients in nature. Eight sampling stations (see Fig. 5) were established in the field and a "line" marked in the field with stake wire flags, to delineate the boundary between stations determined to be inside the wetland boundary and stations determined to be outside the wetland boundary.

Hydrology

Runoff and shallow groundwater are responsible for wetland hydrology at the Project site. The wetland was investigated and surveyed during the wet season,

so obvious primary hydrology indicators (USACE, 1987), such as high water table and saturation in the upper 30 cm (12 in), were present at most of the investigation sites, even those determined to be outside of the wetland boundary. Evidence of ponding water was present in Area C in the form of a wrack line.

Soil

The Soil Survey for Oʻahu (Fig. 3; Foote et al., 1972) maps the soil in the western portion of the parcel (areas investigated as potential wetlands) as Haleiwa silty clay (HeA), 0 to 2 percent slopes. Haleiwa silty clay formed in alluvium is found on fans and in drainageways along the coastal plains. The drainage class is well drained with depth to the water table typically more than 200 cm (80 in); the frequency of flooding is occasional, and the frequency of ponding is none. Haleiwa silty clay is listed on the Hawaiʻi hydric soil list (NRCS, 2011). The soil in the eastern portion of the project site is mapped as Kawaihapai clay loam (KIB), 2 to 6 percent slopes. Kawaihapai clay loam is also formed in alluvium, and has similar properties and qualities as Haleiwa silty clay.

The soils in Area A transition from clearly hydric soils at Sampling Point A1 (thick layer of peat overlaying a mineral layer with a depleted matrix) to soils on the western wetland margin (i.e., Sampling Point A3) that display some characteristics of iron depletion and matrix reduction, although not to the extent required to characterize them as hydric soils. The soils in Area B showed a consistent depleted matrix. The soils in Area C showed some evidence of anaerobic conditions, primarily through evidence of redox depletions and concentrations, but not to the extent required to characterize them as hydric soils.

Vegetation

A list of plant species observed in the area is presented in Table 1. The March 2011 survey was not intended to discover all plants on the Project parcels, so the list is incomplete with respect to the Project area, but represents those species of plants noted at sampling points and other places incidental to the wetland survey.

Wetland indicator status for each species after the official wetland delineation source (Reed, 1988) is given in the far right column. Species not listed in Reed are marked "NL"; if listed in the more up-to-date source (Puttock & Imada, 2004), the revised status is given following "NL/" in the status column.

Table 1. Listing of plants (flora) observed on March 10, 2011 as part of a Haleʻiwa, Oʻahu wetland delineation.

Species listed by family	Common name	Status	Abundance	WL STATUS
FLOWERING PLANTS				
DICOTYLEDONES				
ACANTHACEAE				
Asystasia gangetica (L.) T. Anderson	Chinese violet	Nat	U	OBL
Dicliptera chinensis (L.) Juss.	---	Nat	U	NL/FAC
Megaskepasma erythrochlamys Lindau	Brazilian bower	Orn	R	NL
ANACARDIACEAE				
Schinus terebinthefolius Raddi	Christmas berry	Nat	C	FACU
ASTERACEAE (COMPOSITAE)				
Pluchea indica (L.) Less.	Indian fleabane	Nat	C	FAC
Sphagneticola trilobata (L.)	wedelia	Nat	A	FACU
CONVOLVULACEAE				
Ipomoea sp.	---	Orn	R	--
Merremia tuberosa (L.) Rendle	wood rose	Nat	O	NL/UPL
CUCURBITACEAE				
Coccinia grandis (L.) Voigt	scarlet-fruited gourd	Nat	R	OBL
FABACEAE				
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	C	NL/UPL
Peltophorum pterocarpum (A. P. Candolle) K. Heyne	yellow poinciana	Orn	O	NL
Pithecellobium dulce (Roxb.) Benth.	*ʻopiuma*	Nat	R	NL/FAC
Samanea saman (Jacq.) Merr.	monkeypod	Nat	--	NL/UPL
MALVACEAE				
Abutilon grandifolium (Willd.) Sweet	hairy abutilon	Nat	R	NL/UPL
Hibiscus rosa-sinensis L.	Chinese hibiscus	Orn	U	NL
MORACEAE				
Ficus microcarpa L. fil.	Chinese banyan	Nat	R	NL/FACU
MYRTACEAE				
Psidium cattleianum Sabine	strawberry guava	Nat	R	FACU
Syzygium cumini (L.) Skeels	Java plum	Nat	C	FACU
PHYTOLACCACEAE				
Rivina humilis L.	coral berry	Nat	R	NL/UPL
RUBIACEAE				
Paederia foetida L.	*maile pilau*	Nat	R	NL/UPL

Table 12 (continued).

Species listed by family	Common name	Status	Abundance	WL STATUS
MONOCOTYLEDONES				
ARACEAE				
Syngonium cf. *podophyllum* Schott	nephthytis	Nat	O	NL
ARECAEAE				
Livistonia chinensis (Jacq.) R. Br. Ex Mart.	Chinese fan palm	Nat	R	NL/FACU
Phoenix dactylifera L.	date palm	Nat	C	NL/FAC
BROMELIACEAE				
Portea sp.	---	Orn	R	NL
COMMELINACEAE				
Commelina diffusa N. L. Burm.	*honohono*	Nat	R	FACW
CYPERACEAE				
Cyperus involucratus Rottb.	umbrella sedge	Nat	R	OBL
POACEAE				
Panicum maximum Jacq.	Guinea grass	Nat	C	FACU
Urochloa mutica (Forssk.) Nguyen	para grass	Nat	AA	FACW

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:
- **Ind** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

ABUNDANCE = occurrence ratings for plants by area:
- R – Rare: seen in only one or perhaps two locations.
- U - Uncommon: seen at most in several locations
- O - Occasional: seen with some regularity
- C - Common: observed numerous times during the survey
- A - Abundant: found in large numbers; may be locally dominant (AA).

WETLAND STATUS: after Reed (1988); plant species with status "NL" (not listed) are considered non-wetland or upland species; status following "NL/" is from Puttock and Imada (2004).
- **OBL** – An obligate wetland species occurring >99% of the time in wetlands.
- **FACW** – A facultative wetland species occurring 67-99% of the time in a wetland.
- **FAC** – A facultative species occurring 34-66% of the time in a wetland.
- FACU – A facultative upland species occurring 1 to 33% of the time in wetlands.
- UPL – An upland species occurring generally less than 1% of the time in wetlands.

Conclusions

As determined from the sampling points, the delineated boundaries of the two wetlands are as shown approximately in Fig. 5. Marker flags were placed in the field for wetland A. Wetland B was walked with the GPS unit. However, the outlines indicated in Fig. 5 are only approximations. The dense tree canopy made accurate GPS readings impossible.

Figure 5. Aerial (satellite) image of Project area with soil pit locations (red dots) and approximate boundaries (thin white lines) of wetlands A and B.

The area A wetland (approximate area as shown in Fig. 5 is 2,040 ft^2) is considered a groundwater-driven/fresh/depression/ mineral substrate palustrine wetland and the wetland in Area B is considered a precipitation-driven/fresh/depression/mineral substrate palustrine wetland according to the Hawaiʻi wetland analysis protocol proposed in Erickson & Puttock (2006). Using the Cowardin classification system (Cowardin et al., 1979), area A is a PUBHx and PUBH (palustrine, unconsolidated bottom, permanently flooded excavated and palustrine, unconsolidated bottom, permanently flooded) wetland. Area B (approximate area as shown in Fig. 5 is 2,380 ft^2) is a PEM1C (palustrine, emergent, persistent, seasonally flooded) wetland. The soils of the two wetlands are primarily Haleiwa silty clay, a hydric soil on the local list. High water table and saturation in the upper 30 cm (12 in) are the two most prevalent indicators of wetland hydrology. Area A is shaded to such a degree by trees growing on the bank and beyond the wetland, that wetland indicator plants are rare. Area C is also heavily shaded in most places, but plants occurring where sufficient light penetrates the canopy are not wetland indicator species.

Although isolated in a sense, these two wetland areas are connected as part of a shallow drainage ditch that can be traced to a large wetland as indicated on Fig. 2. Connections only exist during periods of flooding. Jurisdictional status of this large wetland is unknown to us. We would interpret the two features described in this report as part of a local drainage ditch partly constructed and partly a remnant of a much more expansive wetland that existed here before development of the area.

Section 404(b)(1) of the Clean Water Act provides guidelines to limit adverse impact to aquatic resources and a Mitigation Memorandum of Agreement (MOA) between the ACOE and the U.S. Environmental Protection Agency provides guidance for implementing the 404(b)(1) guidelines (USACE and USEPA, 1990). The Mitigation MOA requires the following sequence to be used in evaluating proposed projects:

1. determination that potential impacts have been **avoided** to the maximum extent practicable;
2. remaining unavoidable impacts then will be mitigated to the extent appropriate and practicable by requiring steps to **minimize** impacts
3. and, finally, **compensate** for aquatic resource values.

Appropriate and practicable steps to minimize the adverse impacts will be required through project modifications and permit conditions. Appropriate and practicable compensatory mitigation is required for unavoidable adverse

impacts that remain after all appropriate and practicable minimization has been required.

According to the U.S. Army Corps of Engineers Honolulu District Compensatory Mitigation and Monitoring Guidelines (USACE, 2005), until a functional loss and value methodology is developed for wetlands in Hawaiʻi, compensatory mitigation in the Honolulu District will be based on a acreage calculation with a typical requirement of, at a minimum, one replacement acre for every one acre of waters of the U.S. lost. Mitigation proposals may include on-site mitigation, off-site mitigation, or some combination of both. The mitigation site should be adjacent to or contiguous with the impact site when practicable in order to preserve locally important functions such as local flood control or a specific, unique wildlife habitat. Off-site mitigation should occur when on-site mitigation is not practicable, or when an off-site mitigation project would provide a greater environmental benefit within the watershed than on-site. Types of acceptable mitigation projects include preservation, enhancement, restoration, creation, or a combination of any of these. Monitoring, research, and education may be a component of mitigation, but are not, by themselves, sufficient as mitigation.

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Attachment 1

Wetland data sheets

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Matsumoto** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **A1**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:027**

Landform (hillslope, coastal plain, etc.): **coastal plain, drainage ditch** Local relief (concave, convex, none): **nearly level with gentle sloping to north**

Lat: **2387878.5 N** Long: **592798.5 E** Datum: ____ Slope (%): ____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: **PUBHx**

Are climactic/hydrologic conditions on the site typical for this time of year: Yes X No ____ (If no, explain in Remarks)

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation X, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____

Hydric Soil Present? Yes X No ____

Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks: Area shaded by surrounding trees.

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: 20 x 20 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Syzygium cuminii**	40		FACU
2. **Phoenix dacylifera**	40		NL
3. **Peltophorum pterocarpum**	5		NL
4.			
5.			
	=Total Cover		

Sapling/Shrub Stratum (Plot size: ____)			
1. **not present**			
2.			
3.			
4.			
5.			
	=Total Cover		

Herb Stratum (Plot size: 10 x 10 m)			
1. **Syngonium cf. podophyllum**	40		NL
2. **Cyperus involucratus**	20		FACW
3. **Portea sp.**	5		NL
4. **Commelina diffusa**	< 5		FACW
5. **Spagneticola trilobata**	< 1		FACU
6.			
7.			
8.			
	70% =Total Cover		

Woody Vine Stratum (Plot size: ____)			
1. **not present**			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: none (A)

Total Number of Dominant Species Across All Strata: none **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: **Trees create deep shade but are growing at and beyond banks. ; Dominant herb a vine growing in from margins. Only other plantb at station is FACW.**

SOIL

Sampling Point: A1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc[2]	Texture	Remarks
0 - 8	black	100					peat	fibric
8 - 28	10YR 2/1	100					silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisols (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
X Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Redox (S5)
___ Dark-Surface (S7)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present: Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

X Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
X Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tiled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
X Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): ____

Water Table Present? Yes X No ____ Depth (inches): <1

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Matsumoto** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **A2**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:027**

Landform (hillslope, coastal plain, etc.): See A1 Local relief (concave, convex, none): See A1

Lat: 2387881.5 N Long: 592799.5 E Datum: ____ Slope (%): ____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: **PUBHx**

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ____ No ____ (If no, explain in Remarks)

Are Vegetation **X**, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes **X** No ____

Are Vegetation **X**, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present? Yes **X** No ____

Hydric Soil Present? Yes **X** No ____

Wetland Hydrology Present? Yes **X** No ____

Is the Sampled Area within a Wetland? Yes X No ____

Remarks: Soil pit located in sloped bank to assess wetland edge.

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. **Same area as A1**			
3.			
4.			
5.			
	____ =Total Cover		

Sapling/Shrub Stratum (Plot size: ____)			
1. **Same area as A1**			
2.			
3.			
4.			
5.			
	____ =Total Cover		

Herb Stratum (Plot size: ____)			
1. **Same area as A1**			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	____ =Total Cover		

Woody Vine Stratum (Plot size: ____)			
1. **Same area as A1**			
2.			
	____ =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: none (A)

Total Number of Dominant Species Across All Strata: none **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: **Arera mostly bare of vegetation due to shading by adjacent large trees; plants as described for Soil A1. Representative plant on wet side is FACW.**

SOIL

Sampling Point: A2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc[2]	Texture	Remarks
0 - 8	10YR 2/2	95	10YR 6/3	<5	C	PL	silty clay	
8 - 16	10YR 2.5/1	95	10YR 2/2	<5		M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisols (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
X Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Redox (S5)
___ Dark-Surface (S7)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present: Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Innundation Visible on Aerial Imagery (B7)
___ Water Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
X Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tiled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): 14

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 8

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Matsumoto** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **A3**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:032**

Landform (hillslope, coastal plain, etc.): See A1 Local relief (concave, convex, none): See A1

Lat: 2387859.9 N Long: 592790.7 E Datum: _____ Slope (%): _____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: **PUBH**

Are climactic/hydrologic conditions on the site typical for this time of year: Yes_____ No_____ (If no, explain in Remarks)

Are Vegetation X, Soil_____, or Hydrology_____ significantly disturbed? Are "Normal Circumstances" present? Yes_____ No X

Are Vegetation X, Soil_____, or Hydrology_____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes_____	No X	**Is the Sampled Area within a Wetland? Yes_____ No X**
Hydric Soil Present?	Yes_____	No X	
Wetland Hydrology Present?	Yes_____	No X	

Remarks: Soil pit set at extreme west end to assess extent of wetland boundary; natural herbaceous vegetation obscured by deep shade and extensive dumping of cut vegetation.

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____=Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____=Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____=Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____(A)

Total Number of Dominant Species Across All Strata: _____**(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: _____(A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x1= _____
FACW species _____	x2= _____
FAC species _____	x3= _____
FACU species _____	x4= _____
UPL species _____	x5= _____
Column Totals: _____(A)	_____(B)

Prevalence Index = B/A= _____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes_____ No X

Remarks: **No or minimal herbaceous growth due to shading by adjacent trees; large toppled *Peltaphorum pterocarpum* lies across wetland area.**

SOIL

Sampling Point: A3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc[2]	Texture	Remarks
0 - 1	black						organic	
1 - 10	5YR 3/3		gley	2	D	PL	silty clay	
10 - 14	5YR 3/2		5YR 3/3	50	RM	M	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisols (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Redox (S5)
___ Dark-Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present: Yes_____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Innundation Visible on Aerial Imagery (B7)
___ Water Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tiled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
x Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes_____ No X Depth (inches): _____

Water Table Present? Yes_____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes_____ No X Depth (inches): _____

Wetland Hydrology Present? Yes_____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Matsumoto** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **B1**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:013**

Landform (hillslope, coastal plain, etc.): _____ Local relief (concave, convex, none): _____

Lat: 2387740.7 N Long: 592784.4 E Datum: _____ Slope (%): _____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: _____

Are climactic/hydrologic conditions on the site typical for this time of year: Yes **X** No _____ (If no, explain in Remarks)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present? Yes **X** No _____

Hydric Soil Present? Yes **X** No _____

Wetland Hydrology Present? Yes **X** No _____

Is the Sampled Area within a Wetland? Yes X No _____

Remarks: **Low area of depression close to drainage (from adjacent property) outlet.**

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. **None**			
2.			
3.			
4.			
5.			
	_____ =Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. **None**			
2.			
3.			
4.			
5.			
	_____ =Total Cover		
Herb Stratum (Plot size: 10 x 10 m)			
1. **Sphagneticola trilobata**	**55%**		**FACU**
2. **Urochloa mutica**	**45%**		**FACW**
3.			
4.			
5.			
6.			
7.			
8.			
	100 =Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. **None**			
2.			
	_____ =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: none (A)

Total Number of Dominant Species Across All Strata: _____ **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species		x1=
FACW species	45	x2= 90
FAC species		x3=
FACU species	55	x4= 220
UPL species		x5=
Column Totals:	100 (A)	310 (B)

Prevalence Index = B/A= 3.1

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

X Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: **Boundary walked with GPS, here along edge between U. mutica and Panicum maximum (grasses). FACW could be 50% or greater acrtoss most of basin.**

SOIL

Sampling Point: B1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc[2]	Texture	Remarks
0 - 9	10YR 2/2	100					silty clay	
9 - 40	10YR 2/2	90	10YR 6/3	10	C	PL	silty clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- ___ Histisols (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Redox (S5)
- ___ Dark-Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Sandy Mucky Mineral (S1)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present: Yes X No _____

Remarks:

10 cm layer of intact para grass stems on top of soil

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Innundation Visible on Aerial Imagery (B7)
- ___ Water Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tiled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No **X** Depth (inches): _____

Water Table Present? Yes **X** No ____ Depth (inches): **7**

Saturation Present? (includes capillary fringe) Yes **X** No ____ Depth (inches): **surface**

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Matsumoto** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **B2**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:013**

Landform (hillslope, coastal plain, etc.): **coastal plain** Local relief (concave, convex, none): **shallow depression**

Lat: **2387746.9 N** Long: **592798.4 E** Datum: _____ Slope (%): _____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: _____

Are climactic/hydrologic conditions on the site typical for this time of year: Yes _____ No _____ (If no, explain in Remarks)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No _____	
Hydric Soil Present?	Yes **X**	No _____	**Is the Sampled Area**
Wetland Hydrology Present?	Yes **X**	No _____	**within a Wetland? Yes X No** _____

Remarks: **More upland part of extensive U. mutica growth to assess extent of wetland soil in this shallow basin.**

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. **None**			
2.			
3.			
4.			
5.			
	_____ =Total Cover		
Sapling/Shrub Stratum (Plot size: 10 x 10 m)			
1. **Pluchea indica**	**5 %**		**FAC**
2.			
3.			
4.			
5.			
	_____ =Total Cover		
Herb Stratum (Plot size: _____)			
1. **Urochloa mutica**	**95 %**		**FACW**
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ =Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **1** **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: **100** (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x1= _____
FACW species _____	x2= _____
FAC species _____	x3= _____
FACU species _____	x4= _____
UPL species _____	x5= _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A= _____

Hydrophytic Vegetation Indicators:

X 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks

SOIL

Sampling Point: B2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc[2]	Texture	Remarks
0 - 3	**10YR 2/2**	**100**					**silty loam**	**lots of organic material**
3 - 8	**10 YR 2/2**	**60**	**10 YR 3/4**	**40**		**M**	**clay & gravel**	
>8							**blue rock gravel**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisols (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Redox (S5)
___ Dark-Surface (S7)
___ Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: **gravel**

Depth (inches): **8**

Hydric Soil Present: Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Innundation Visible on Aerial Imagery (B7)
___ Water Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tiled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No **X** Depth (inches): _____

Water Table Present? Yes ____ No **X** Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes **X** No ____ Depth (inches): **3**

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Haleiwa** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **C1**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:013**

Landform (hillslope, coastal plain, etc.): **coastal plain** Local relief (concave, convex, none): **very gentle slope to west**

Lat: **2387762.1 N** Long: **592805.5 E** Datum: ____ Slope (%): ____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: ____

Are climactic/hydrologic conditions on the site typical for this time of year: Yes **X** No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No **X**

Hydric Soil Present? Yes ____ No **X**

Wetland Hydrology Present? Yes **X** No ____

Is the Sampled Area within a Wetland? Yes ____ No X

Remarks: **Area of previous fill, soil shallow over blue rock (commercial) gravel.**

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Syzygium cuminii**			**FACU**
2. **Phoenix dactylifera**			**NL**
3. **Schinus terebinthefolius**			**FACU**
4.			
5.			
	____ =Total Cover		

Sapling/Shrub Stratum (Plot size: ____)			
1. **Psidium cattleianum**	**<5%**		**FAC**
2.			
3.			
4.			
5.			
	____ =Total Cover		

Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	____ =Total Cover		

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: none (A)

Total Number of Dominant Species Across All Strata: none **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks **Area deeply shaded by surrounding trees**

SOIL

Sampling Point: C1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc[2]	Texture	Remarks
0 - 2							**organic**	
2 - 6	**10YR 2/2**	**50**	**10YR 2/1**	**50**			**loam & gravel**	
>6							**blue rock gravel**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisols (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Redox (S5)
___ Dark-Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present: Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Innundation Visible on Aerial Imagery (B7)
___ Water Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tiled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No **X** Depth (inches): ____

Water Table Present? Yes ____ No **X** Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes **X** No ____ Depth (inches): **6**

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Matsumoto** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **C2**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:013**

Landform (hillslope, coastal plain, etc.): **coastal plain** Local relief (concave, convex, none): **flat**

Lat: **2387767.6 N** Long: **592789.0 E** Datum: ____ Slope (%): ____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: ____

Are climactic/hydrologic conditions on the site typical for this time of year: Yes **X** No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No **X**	
Hydric Soil Present?	Yes ____	No **X**	**Is the Sampled Area**
Wetland Hydrology Present?	Yes **X**	No ____	**within a Wetland? Yes ____ No X**

Remarks:

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: **10 x 10 m**)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Syzygium cuminii**	**70**		**FACU**
2. **Phoenix dactylifera**	**< 1**		**NL**
3.			
4.			
5.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: **5 x 10 m**)			
1. **Panicum maximum**	**45**		**FACU**
2. **Syngoniium cf. pdophyllim**	**10**		**NL**
3.			
4.			
5.			
6.			
7.			
8.			
	____ =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: none (A)

Total Number of Dominant Species Across All Strata: none **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No **X**

Remarks **Floodway is bare (shaded) and Panicum maximum**

SOIL

Sampling Point: C2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc[2]	Texture	Remarks
0 - 1	**black**						**peat**	
1 - 5	**10YR 3/2**						**loam**	
5 - 13	**10YR 3/3**	**95**	**10YR 6/3**	**5**		**PL**		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisols (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Redox (S5)
___ Dark-Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present: Yes ____ No **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
X Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Innundation Visible on Aerial Imagery (B7)
X Water Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
X Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tiled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No **X**	Depth (inches): ____
Water Table Present?	Yes **X**	No ____	Depth (inches): **7**
Saturation Present? (includes capillary fringe)	Yes **X**	No ____	Depth (inches): **1**

Wetland Hydrology Present? Yes **X** No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM—Hawai'i and Pacific Islands

Project/Site: **Matsumoto** City: **Haleiwa** Sampling Date: **March 10, 2011** Time: **AM**

Applicant/Owner: **Kamehameha Schools** State/Terr.: **HI** Island: **O'ahu** Sampling Point: **C3**

Investigator(s): **Eric Guinther and Susan Burr** TMK/Parcel: **(1) 6-6-004:013**

Landform (hillslope, coastal plain, etc.): **coastal plain** Local relief (concave, convex, none): **flat**

Lat: **2387810.5 N** Long: **592779.2 E** Datum: ____ Slope (%): ____

Soil Map Unit Name: **Haleiwa silty clay, 0 to 2% slopes** NWI classification: ____

Are climactic/hydrologic conditions on the site typical for this time of year: Yes ____ No ____ (If no, explain in Remarks)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS—Attach a site map showing sampling point locations transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	
Hydric Soil Present?	Yes X	No ____	**Is the Sampled Area**
Wetland Hydrology Present?	Yes X	No ____	**within a Wetland? Yes ____ No X**

Remarks:

VEGETATION—Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1. **Peltophorum pterocarpum**			**NL**
2. **Syzygium cumini**			**FACU**
3.			
4.			
5.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. **Leucaena leucocephala**	**1**		**NL**
2.			
3.			
4.			
5.			
	____ =Total Cover		
Herb Stratum (Plot size: ____)			
1. **Epipremnum pinnatum**	**90**		**NL**
2. **Dicliptera chinensis**	**1**		**NL**
3.			
4.			
5.			
6.			
7.			
8.			
	____ =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: none (A)

Total Number of Dominant Species Across All Strata: none **(B)**

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x1= ____
FACW species ____	x2= ____
FAC species ____	x3= ____
FACU species ____	x4= ____
UPL species ____	x5= ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A= ____

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test is >50%

___ 3 - Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation [1] (Explain in Remarks or in the delineation report)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks

SOIL

Sampling Point: C3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type [1]	Loc[2]	Texture	Remarks
0 - 12	**7.5YR 2.5/2**	**98**	**10YR 3/6**	**2**	**C**	**PL**	**sandy loam**	
12 - 16	**7.5YR 3/1**						**sandy loam**	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

___ Histisols (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Redox (S5)
___ Dark-Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
X Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Sandy Mucky Mineral (S1)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ____

Depth (inches): ____

Hydric Soil Present: Yes X No ____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: (Explain observations in Remarks, if needed.)

Primary Indicators (minimum of one required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Innundation Visible on Aerial Imagery (B7)
___ Water Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
X Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tiled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burros (C10) (Guam, CNMI, and American Samoa)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
X Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____	No X	Depth (inches): ____

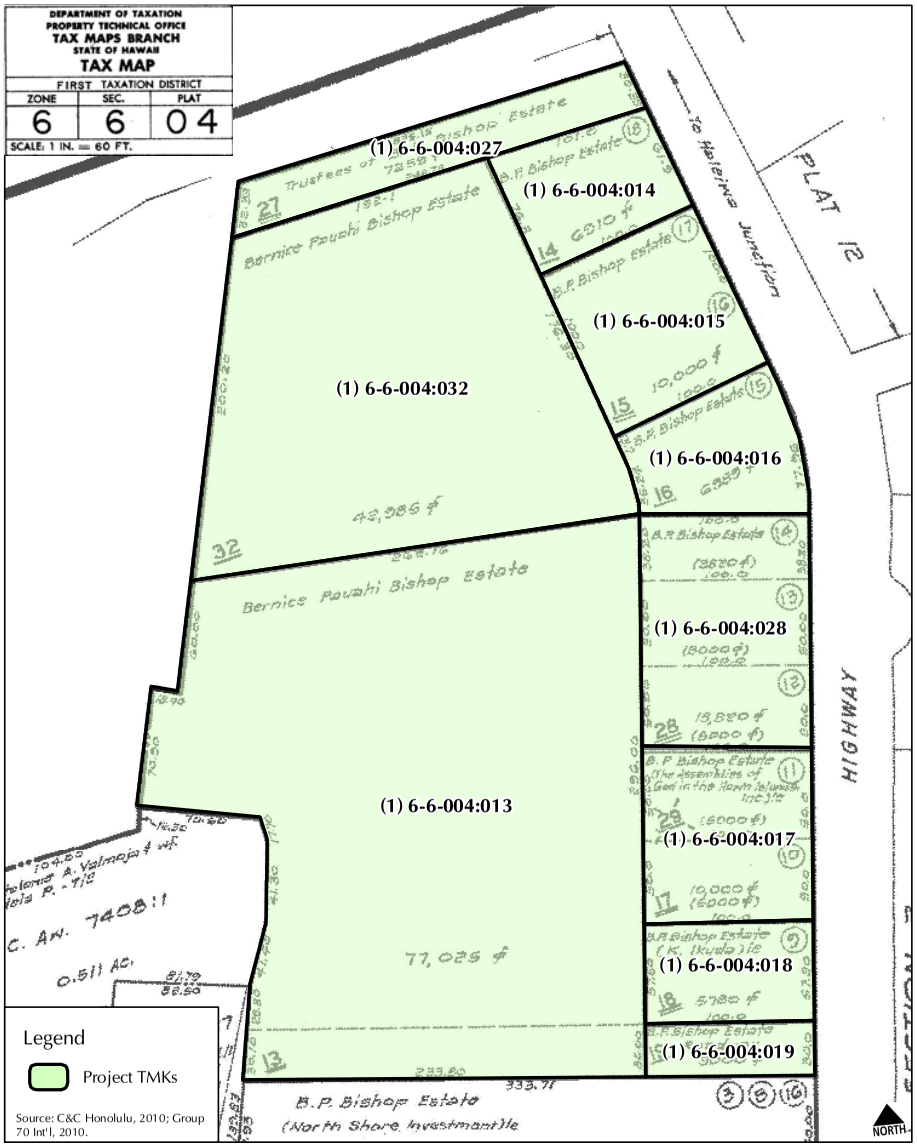
Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Attachment 2

Tax Map



Appendix B
TREE ASSESSMENT REPORT

Steve Nimz and Associates Inc.
Consulting Arborist Services
PO BOX 10026 Honolulu, Hawaii 96816
Office # (808) 734-5963 Fax # (808) 732-4433
Email: Steve@stevenimz.com

March 29, 2011

Ms. Hilarie Alomar
Kamehameha Schools
567 South King Street # 200
Honolulu, HI 96813

Re: Haleiwa Commercial Redevelopment Project Tree Assessment Report

Dear Ms. Alomar:

The following Tree Assessment was requested by Ms. Hilarie Alomar, Land Planning Manager for Kamehameha Schools. The project site is identified as the Haleiwa Commercial Redevelopment Project on Kamehameha Highway. The site is bordered by Kewalo and Mahaulu Lanes (site map).

The project incorporates approximately one-half of the total site area starting from Kamehameha Highway sloping downward into the property.

A site inspection was conducted on March 12, 2011 to collect data on the existing trees and palms. Eighty-one (81) trees and palms were identified and numbered on the Topo survey site map provided. The detailed spreadsheet corresponds to the site map and provides:

1. Tree number
2. Species- common and scientific name
3. Trunk diameter
4. Height
5. Crown spread
6. Health rating (visual inspection)
7. Structural rating (visual inspection)
8. Disposition rating (remain, prune, relocate, remove)
9. Comments regarding health, structural condition
10. Photographs

The majority of the trees identified are volunteer growth, including Opiuma, Java Plum, African Tulip and Date Palms. Several of these are rated as invasive species.

On the preliminary design drawing two major Ficus trees, # 14 and # 24, are designated to remain on site (Preliminary design site map). The trees are large significant mature specimens with extensive exposed surface roots. The trees will require maintenance pruning to include crown cleaning and raising.

Ficus # 14

Ficus # 24

The exposed roots of Ficus tree # 24 will need to be addressed to minimize damage by proposed seating, walkway and hardscape design. A minimum twenty-foot radius from the trunk should be preserved.

Ficus # 24

Ficus tree # 14 is at a lower grade (16.1) compared to the roadway at (18.9) care will need to be taken not to fill more than twelve to eighteen inches over the root structure. If fill is necessary, use non-compacted soil.

Additional trees worthy of preserving include Mango # 1 at the corner of Kamehameha Highway and Mahaulu Lane. The tree will require crown raising to twelve feet and thinning.

Ficus tree # 12 along Mahaulu Lane is a large healthy specimen. If the parking lot entry does not conflict with the tree, the tree could be pruned into a major landmark for the project.

If it does not conflict with the parking lot on Mahaulu Lane, Mango tree # 77 could remain.

If it cannot remain in place, Milo tree # 76 has high quality wood for wood workers.

Monkeypod tree # 78 and Neem # 27 are two small trees that are good transplant candidates, possibly along the back of the parking lot.

There are approximately twelve (12) Date palms and one (1) Coconut palm that are relocatable for the project, or they can be offered to the landscape industry for use in other projects.

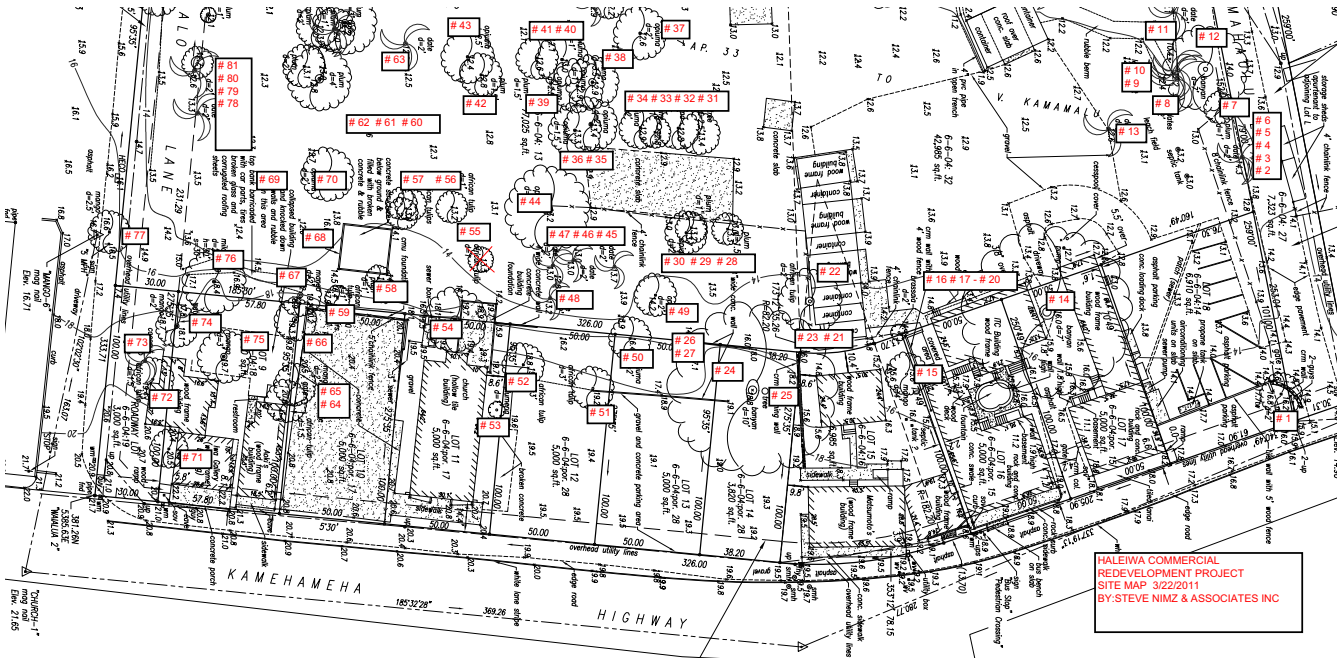
If you have any questions, please contact my office at 808-734-5963.

Respectfully yours,

Steve Nimz,
ASCA Consulting Arborist

ISA Certified Arborist # WE- 0314AM
ISA PNW Certified Tree Risk Assessor # 419

Attachments:
- Spreadsheet
- Site map
- Design site map
- Photographs



Haleiwa Commercial Redevelopment Project

Tree #	Species	Scientific Name	Diameter (inches)	Height (feet)	Crown Spread	Health Condition	Structural Condition	Prune, Remove, Transplant	Photo	Comments
1	Mango	Mangifera indica	32	35	20	Good	Good	P (CR)	1	Candidate to remain
2	Date Palm	Phoenix dactylifera		5		Good	Good	TP	2	
3	Date Palm	Phoenix dactylifera		5		Good	Good	TP	2	
4	Date Palm	Phoenix dactylifera		5		Good	Good	TP	2	
5	Date Palm	Phoenix dactylifera		40		Good	Good	Remove	3	
6	Date Palm	Phoenix dactylifera		50		Good	Good	Remove	3	
7	Java Plum	Syzygium cumini	15	45	35	Fair	Poor	Remove	4	Broken branches
8	Date Palm	Phoenix dactylifera		30		Good	Poor	Remove	4	Leaning at forty-five degrees
9	Date Palm	Phoenix dactylifera		40		Good	Fair	Remove	5	
10	Date Palm	Phoenix dactylifera		35		Good	Fair	Remove	5	
11	Date Palm	Phoenix dactylifera		40		Good	Fair	Remove	5	
12	Ficus	Ficus microcarpa	60	55	60	Good	Fair	Prune	5	Candidate to remian, large tree, prune off wires, thin and raise crown
13	Date Palm	Phoenix dactylifera		40		Good	Fair	Remove	6	Leaning curved trunk
14	Ficus	Ficus microcarpa		65	80	Good	Fair	P (CR, CC)	7	Gall wasp infestation (grade change)
15	Mango	Mangifera indica	36	40	30	Good	Good	Remove	8	
16	Brassaia	Brassaia actinophylla	22	20	10	Good	Fair	Remove	9	
17-20	Areca Palms	Dypsis lutescens		25		Good	Good	Remove/TP	10	
21	Date Palm	Phoenix dactylifera		8		Good	Good	TP	11	
22	African Tulip	Spathodea campanulata	28	50	10	Good	Fair	Remove	11	Ficus growing around tree
23	Java Plum	Syzygium cumini	10	30	10	Fair	Poor	Remove	11	

Haleiwa Commercial Redevelopment Project

Tree #	Species	Scientific Name	Diameter (inches)	Height (feet)	Crown Spread	Health condition	Structural condition	Prune, remove, transplant	Photo	Comments
24	Ficus	Ficus microcarpa	120	60	120	Fair	Good	P (CC, CR)	12, 13	Gall Wasp infestation (treat), multi-trunk, exposed roots
25	African Tulip	Spathodea campanulata	38	60	30	Fair	Poor	Remove	12	Growing adjacent to Ficus
26	Royal Poinciana	Delonix regia	18	40	25	Fair	Fair-Poor	Remove	14	Leaning trunk
27	Neem	Azadirachta indica	4	15	10	Good	Good	TP	14	
28	African Tulip	Spathodea campanulata	6	15	10	Fair	Poor	Remove	15	
29	Java Plum	Syzygium cumini	4	15	10	Fair	Poor	Remove	15	
30	Java Plum	Syzygium cumini	10	25	10	Fair	Poor	Remove	15	
31	Java Plum	Syzygium cumini	8	15	10	Fair	Poor	Remove	15	
32	Java Plum	Syzygium cumini	6	15	10	Fair	Poor	Remove	15	
33	Java Plum	Syzygium cumini	10	20	10	Fair	Poor	Remove	15	
34	Java Plum	Syzygium cumini	10	20	10	Fair	Poor	Remove	15	
35	Java Plum	Syzygium cumini	8	15	8	Fair	Poor	Remove	15	
36	Opiuma	Pithecellobium dulce	18	45	20	Fair	Poor	Remove	16	
37	Java Plum	Syzygium cumini	6	15	8	Fair	Poor	Remove	16	
38	Java Plum	Syzygium cumini	8	20	15	Fair	Poor	Remove	16	
39	Java Plum	Syzygium cumini	10	25	10	Fair	Poor	Remove	16	
40	Java Plum	Syzygium cumini	6	15	10	Fair	Poor	Remove	16	
41	Java Plum	Syzygium cumini	8	15	10	Fair	Poor	Remove	16	
42	Opiuma	Pithecellobium dulce	10	25	10	Fair	Poor	Remove	16	
43	Opiuma	Pithecellobium dulce	8	20	10	Fair	Poor	Remove	16	

Haleiwa Commercial Redevelopment Project

Tree #	Species	Scientific Name	Diameter (inches)	Height (feet)	Crown Spread	Health Condition	Structural Condition	Prune, remove, transplant	Photo	Comments
44	Opiuma	Pithecellobium dulce	38	40	25	Fair	Poor	Remove	16	Ficus growing over tree
45	Date Palm	Phoenix dactylifera		8		Good	Fair	TP	17	
46	Date Palm	Phoenix dactylifera		30		Good	Fair	TP	17	
47	Date Palm	Phoenix dactylifera		8		Good	Fair	TP	17	
48	Date Palm	Phoenix dactylifera		35		Good	Fair	TP	17	
49	Opiuma	Pithecellobium dulce	12	30	15			Remove	17	
50	Opiuma	Pithecellobium dulce	12	30	20			Remove	17	
51	African Tulip	Spathodea campanulata	28	35	30	Good	Good	Remove	18	
52	African Tulip	Spathodea campanulata	22	30	20	Good	Good	Remove	18	
53	Plumeria	Plumeria spp.	8	15	15	Good	Good	TP	19	
54	African Tulip	Spathodea campanulata	42	40	30	Fair	Fair	Remove	20	
55	Date Palm	Phoenix dactylifera		35		Fair	Fair	Remove	20	
56	African Tulip	Spathodea campanulata	10	35	10	Fair	Poor	Remove	21	
57	African Tulip	Spathodea campanulata	20	35	20	Fair	Poor	Remove	21	
58	Java Plum	Syzygium cumini	20	40	20	Fair	Poor	Remove	21	
59	African Tulip	Spathodea campanulata	36	40	25	Poor	Poor	Remove	21	
60	Date Palm	Phoenix dactylifera		35		Good	Good	TP	22	
61	Date Palm	Phoenix dactylifera		30		Good	Good	TP	22	
62	Date Palm	Phoenix dactylifera		35		Good	Good	TP	23	
63	Date Palm	Phoenix dactylifera		30		Good	Good	TP	23	

Haleiwa Commercial Redevelopment Project

Tree #	Species	Scientific Name	Diameter (inches)	Height (feet)	Crown Spread	Health Condition	Structural Condition	Prune, Remove, Transplant	Photo	Comments
64	African Tulip	Spathodea campanulata	34	40	30	Good	Fair	Remove	24	Narrow planter
65	Mango	Mangifera indica	20	35	30	Good	Good	Remove	24	Narrow planter
66	Java Plum	Syzygium cumini	28	40	25	Poor	Poor	Remove	25	
67	Java Plum	Syzygium cumini	20	30	20	Poor	Poor	Remove	25	
68	Date Palm	Phoenix dactylifera		30		Fair	Poor	Remove	25	
69	Coconut Palm	Cocos nucifera		35		Good	Fair	TP	25	
70	Opiuma	Pithecellobium dulce	10	20		Fair	Poor	Remove	25	
71	Avocado	Persea americana	20	15		Poor	Poor	Remove	26	Large trunk cavity
72	African Tulip	Spathodea campanulata	24	40	20	Good	Good	Remain	27	
73	Coconut Palm	Cocos nucifera		25		Poor	Poor	Remove	27	Penciling upper trunk
74	Mango	Mangifera indica	30	25	30	Fair	Fair	Remove	28	
75	Mango	Mangifera indica	28	30	35	Good	Good	Remove	29	
76	Milo	Thespesia populnea	24	30	40	Good	Fair	Remove	30	Good carving wood
77	Mango	Mangifera indica	28	30	20	Fair	Fair	Remove	31	Edge of road
78	Monkeypod	Samanea saman	6	25	15	Good	Good	TP	32	
79	Christmasberry	Schinus terebinthifolius	15	20	40	Fair	Poor	Remove	32	
80	Date Palm	Phoenix dactylifera		35		Fair	Fair	Remove	32	
81	Opiuma	Pithecellobium dulce	10	35	20	Fair	Poor	Remove	32	

Steve Nimz Associates Inc.
3/22/2011

Haleiwa Commercial Redevelopment Project

Photo # 1

Photo # 2

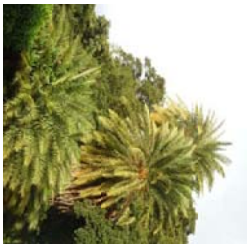


Photo # 3

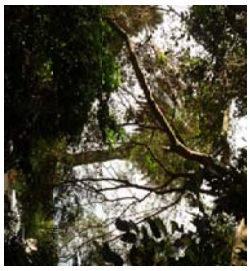


Photo # 4

Photo # 5

Photo # 6

Photo # 7

Photo # 8

Photo # 9

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3/25/2011

Photo # 10

Photo # 11

Photo # 12

Photo # 13

Photo # 14

Photo # 15

Photo # 16

Photo # 17

Photo # 18

Photo # 19

Photo # 20

Photo # 21

Photo # 22

Photo # 23

Photo # 24

Photo # 25

Photo # 26

Photo # 27

Haleiwa Commercial Redevelopment Project

Photo # 28

Photo # 29

Photo # 30

Photo # 31

Photo # 32

Appendix C
BIOLOGICAL SURVEYS REPORT

Biological Surveys Conducted for the Kamehameha Schools, Hale'iwa Commerical Redevelopment Project, Wailua District, Island of O'ahu

Prepared by:

Reginald E. David
Rana Biological Consulting, Inc.
P.O. Box 1371
Kailua-Kona, Hawai'i 96745

Prepared for:

Group 70 International
925 Bethel Street
Honolulu, Hawaii, 96813-4398

February 9, 2011

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Introduction and Background

Kamehahmeha Schools is proposing to redevelop commercial properties located in Hale'iwa, along Kamehameha Highway from Mahaulu Lane to Kewalo Lane (Figure 1). These properties include the popular Matsumoto Shave Ice business. The approximately 4.22-acre site is identified as Tax Map Keys: (1) 6-6-004:013, 14, 15, 16, 17, 18, 19, 27, 28, and 32.

The intent of this redevelopment project is to revitalize existing businesses and provide essential infrastructure, while retaining the rural scale and plantation character of the Hale'iwa Special District. The redevelopment will expand existing retail frontage with a combination of new in-line storefronts and preservation or reconstruction of selected historic buildings. The project will also increase pedestrian pathways and safety, provide a central gathering place, and improve traffic flow with a newly constructed rear parking lot. The existing properties support approximately 14,000 SF of Gross Leasable Area (GLA), while the final build-out of the proposed redevelopment will provide up to 30,000 SF of GLA.

This report describes the methods used and the results of, avian and mammalian surveys conducted on the subject property as part of the environmental disclosure process associated with the proposed redevelopment plan.

The primary purpose of the surveys was to determine if there are any avian or mammalian species currently listed, or proposed for listing under either federal or State of Hawai'i endangered species statutes within or adjacent to the study area. With a special emphasis on determining whether there is any current usage of any part of the site by listed waterbird species. The federal and State of Hawai'i listed species status follows species identified in the following referenced documents, (Department of Land and Natural Resources (DLNR) 1998, U. S. Fish & Wildlife Service (USFWS) 2005a, 2005b, 2011). Fieldwork was conducted on January 31, 2011.

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

General Site Description

The current site has an eclectic mix of retail outlets including restaurants, a church, a general store and a cat emporium and a large irrigation supply and construction business. Several of the buildings are old and or significant and will be retained. Figures 3 through 6 illustrate the current development on the site. Many of the existing buildings will be retained and renovated. Additionally additional parking will be constructed. See Figure 2 for an illustration of the current proposed redevelopment schematic.

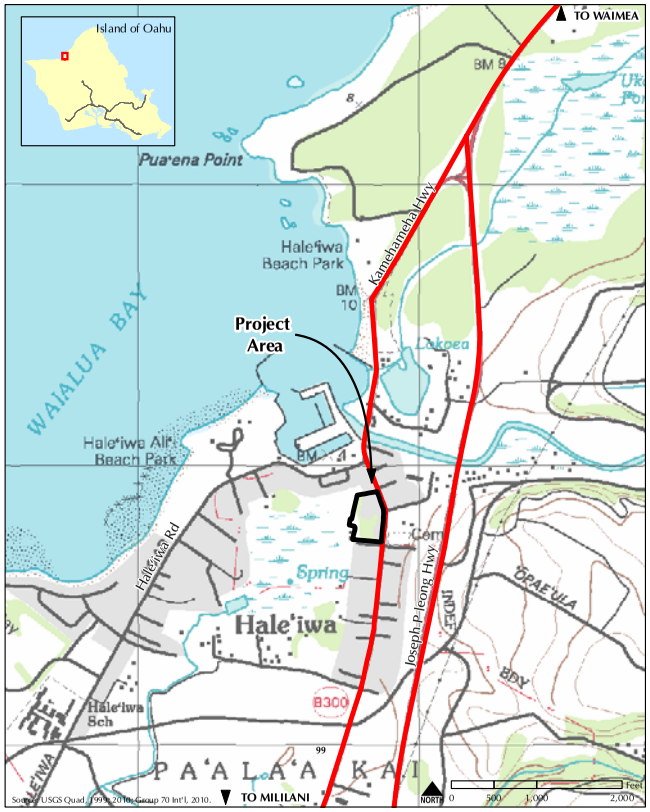

Figure 1 – Project Location Map

Figure 2 – Proposed Redevelopment Schematic

Figure 3 - Southeastern corner of the site, taken looking northeast from Kamehameha Highway and Kewalo Lane

Figure 4 – Northeastern corner of the site, taken from Kamehameha Highway and Mahaulu Lane

Figure 4 – Matsumoto Shave Ice and Store fronting Kamehameha Highway

Figure 5 – M. Yoshida Building fronting Kamehameha Highway

Methods

The avian phylogenetic order and nomenclature used in this report follows the *AOU Check-List of North American Birds* (American Ornithologists' Union 1998), and the 42nd through the 51st supplements to the Check-List (American Ornithologists' Union 2000; Banks et al. 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010). Mammal scientific names follow (Tomich 1986). Place names follow (Pukui et al. 1974).

Avian Survey Methods

One avian count station was sited approximately in the center of the site behind the buildings fronting Kamehameha Highway. A single 8-minute avian point count was made at this station. Field observations were made with the aid of Leica 10 X 42 binoculars and by listening for vocalizations. The count and subsequent search of the remainder of the site was conducted between 7:30 am and 9:30 am the peak of daily bird activity. Time not spent counting the point count station was used to search the rest of the site for species and habitats not detected during the point count.

Avian Survey Results

A total of 98 individual birds of 14 species, representing 10 separate families, were recorded during the station count, no additional species were detected during the remainder of the time spent on the site (Table 1). One species detected, Black-crowned Night-Heron (*Nycticorax nycticorax hoactli*), is an indigenous resident breeding species. It was recorded flying over the site towards the ocean. One species detected, domestic chicken (*Gallus sp.*) is a domesticated species that is not currently considered to be established on the Island of O'ahu. The remaining 12 species recorded are all considered to be alien to the Hawaiian Islands.

No avian species currently protected or proposed for protection under either the federal or State of Hawai'i endangered species programs were detected during the course of this survey (DLNR 1998, USFWS 2005a, 2005b, 2011).

Avian diversity and densities were in keeping with the habitat present on the site. Two species, Common Waxbill (*Estrilda astrild*), and Red-vented Bulbul (*Pycnonotus cafer*) accounted for 44 percent of all birds recorded during the point count. The most commonly recorded species was Common Waxbill, which accounted for slightly more than 27 percent of the total number of individual birds recorded.

Table 1 - Avian Species Detected – Kamehameha Schools Hale'iwa Site

Common Name	*Scientific Name*	*ST*	*RA*
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Red Junglefowl	*Gallus gallus*	D	7
	CICONIIFORMES		
	ARDEIDAE - Herons, Bitterns & Allies		
Black-crowned Night-Heron	*Nycticorax nycticorax hoactli*	IR	1
	COLUMBIFORMES		
	COLUMBIDAE – Pigeons & Doves		
Rock Pigeon	*Columba livia*	A	2
Spotted Dove	*Streptopelia chinensis*	A	4
Zebra Dove	*Geopelia striata*	A	16
	PASSERIFORMES		
	PYCNONOTIDAE - Bulbuls		
Red-vented Bulbul	*Pycnonotus cafer*	A	17
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	4
	TURDIDAE - Thrushes		
White-rumped Shama	*Copsychus malabaricus*	A	2
	STURNIDAE – Starlings		
Common Myna	*Acridotheres tristis*	A	8
	CARDINALIDAE – Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	2
	FRINGILLIDAE – Fringilline And Cardueline Finches & Allies		
	Carduelinae – Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	3
	ESTRILDIDAE – Estrildid Finches		
	Estrildinae – Estrildine Finches		
Common Waxbill	*Estrilda astrild*	A	26
Chestnut Munia	*Lonchura atricapilla*	A	2
Java Sparrow	*Padda oryzivora*	A	4

Key to Table 2.

ST	Status
D	Domesticated Species – Domestic animal not currently considered established on O'ahu
A	Alien Species – introduced to Hawai'i by humans, and have become established in the wild
IR	Indigenous Resident Species – Native but not unique to the Hawaiian islands
RA	Relative Abundance: Number of birds detected divided by the number of count stations (1)

Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *'ōpe'ape'a* as it is known locally, all terrestrial mammals currently found on the Island of O'ahu are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate mammalian species observed and heard within the project area.

Mammalian Survey Results

Three mammalian species were detected during the course of this survey. Numerous dogs (*Canis f. familiaris*) were seen in fenced yards adjacent to the project site. Dog tracks, scat and sign were encountered at numerous locations within the site. Five cats (*Felis c. catus*) were seen within the project site as was ample sign of this species. One lone small Indian mongoose (*Herpestes a. auropunctatus*) was seen running across the ITC Water Management Water Management baseyard.

No mammalian species currently protected or proposed for protection under either the federal or State of Hawai'i endangered species programs were detected during the course of this survey (DLNR 1998, USFWS 2005a, 2005b, 2011).

Discussion

Avian Resources

The findings of the avian survey are consistent with the location of the property, and the habitat present on the site. Only one of the 14 different avian species recorded while on the site is a native species. One Black-crowned Night-Heron was recorded flying west above the site towards the Hale'iwa Ali'i Beach Park

In a letter from the US Fish and Wildlife Service (USFWS) to the project following a request from them for information pursuant to the preparation of the Draft Environmental Assessment for the project (USFWS Log# 2010-TA-0048 November 30, 2010). The USFWS raised concerns over the possibility that the proposed action may pose potential threats to five species protected under the federal Endangered Species Act (ESA): Hawaiian Duck (*Anas wyvilliana*), the Hawaiian endemic sub-species of the Common Moorhen (*Gallinula chloropus sandvicensis*), Hawaiian Coot (*Fulica alai*), the Hawaiian endemic sub-species of the Black-necked Stilt (*Himantopus mexicanus knudseni*), and the Hawaiian hoary bat

Lasiurus cinereus semotus). They also raised the concern that the proposed action may pose threats to an additional avian species, Wedge-tailed Shearwater (*Puffinus pacificus*) which is protected under the federal Migratory Bird Treaty Act (MBTA),

Waterbirds

The duck, moorhen, coot and stilt are all water obligate species. During the time that I spent on the project site there was no standing, or running water on, or immediately adjacent to the site – thus, it was not surprising that no waterbirds were detected. There is a low spot on lot 32, which is currently leased to ITC Water Management (Figure 7). Anecdotal information gathered from Hal Edwards the president of ITC indicates that after heavy rains water ponds to some degree on the site that is currently unpaved and used as a storage and heavy equipment yard – standing water can attract waterbirds, who tend to be opportunistic. They rapidly investigate new or ephemeral standing water on their foraging rounds. The most likely species that might be attracted to the site if standing water was present is Black-necked Stilt, which conceivably could investigate any standing water no matter how shallow, as a potential foraging site. It takes fairly deep water to attract ducks, coots and moorhen.

Figure 7 - Low spot showing signs of past flooding on lot 32

Seabirds

Although no seabirds were detected during the course of this survey, several seabird species likely overfly the site on occasion. Collision with man-made structures is considered to be the second most significant cause of mortality in locally nesting seabird species in

Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961, Telfer 1979, Sincock 1981, Reed *et al*, 1985, Telfer *et al*, 1987, Cooper and Day 1994, Podolsky *et al*, 1998, Ainley *et al*, 2001).

There are no nesting colonies nor appropriate nesting habitat for any of the resident seabird species present on O'ahu on, or immediately adjacent to the project site.

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the property and the habitat currently present on the site. All three of the mammalian species detected during the course of this survey are alien to the Hawaiian Islands. Although no rodents were detected during the course of this survey, it is likely that the four established alien *muridae* fund on O'ahu, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), European house mouse (*Mus musculus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use various resources found within the general project area. All of these introduced rodents are deleterious to native ecosystems and the native faunal species dependant on them.

No Hawaiian hoary bats were detected during the course of this survey. As the bats a crepuscular and nocturnal species the fact that we did not record this species was to be expected. Given the paucity of documented records of this species on O'ahu the chance that any use resources on the subject property are extremely low (USFWS 1998, David 2010).

Potential Impacts to Protected Species

Waterbirds

The principal potential impact that the redevelopment of the site potentially poses to listed waterbird species is during the clearing and grubbing phases of the construction project. Nesting waterbirds are very sensitive to disturbances, man-made or other. As there is no suitable nesting habitat on the project site suitable for nesting by any of the four listed waterbird species present on O'ahu to nest in, it is highly unlikely that the redevelopment of the site will pose any threat to any of these species. There is a very small chance that if rainwater or runoff water were to collect on the construction site that this could attract Black-necked Stilts, the best way to ensure that this does not occur is to ensure that immediately prior to clearing and grubbing activities no standing water is allowed to pond on the site.

Seabirds

The principal potential impact that the development of the site poses to seabirds including the Wedge-tailed Shearwater mention in the USFWS letter, is the increased threat that birds will be downed after becoming disoriented by outdoor lighting associated with possible night-time construction activity, and following build-out with exterior lighting associated with whatever structures and appurtenances that are built on the property.

Hawaiian Hoary Bat

The principal potential impact that the further development of the site poses to Hawaiian hoary bats is during the clearing and grubbing phases of the project. The principal threat that clearing potential roosting habitat poses to this species is between May and July when female bats may be carrying pups and potential may not be able to flee vegetation clearing activity quickly enough to avoid harm (Bonaccorso 2005, 2007, 2009). As previously mentioned the likelihood that bats use resources on the subject property is extremely low. An ultra conservative approach to ensuring that any clearing of trees on the site does not impact bats is to restrict clearing of woody vegetation taller than 4.6 meters (15 feet tall) between April 15 and August 15.

Critical Habitat

There is no federally delineated Critical Habitat present on or adjacent to the property. Thus the redevelopment of the site will not result in impacts to federally designated Critical Habitat. There is no equivalent statute under State law.

Recommendations

- To minimize the potential that Black-necked Stilts are attracted to the construction site, measures to ensure that storm water do not pond on the site should be enacted prior to clearing and grubbing activities.

- If nighttime work will be required in conjunction with the development of the project, it is recommended that lights be shielded to reduce the potential for interactions of nocturnally flying seabirds with external lights and man-made structures (Reed et al. 1985, Telfer *et al.* 1987).

- It is also recommended that all exterior lighting associated with the operation of the proposed facility be shielded so as to reduce the potential for interactions of nocturnally flying seabirds with external lights and man-made structures (Reed *et al.* 1985, Telfer *et al.* 1987).

- It is recommended that if heavy vegetation on the site needs to be cleared, that clearing not occur between May 15 and August 15, when bats may be carrying young and potentially could be placed at risk by such clearing.

Glossary

Alien – Introduced to Hawai'i by humans
Commensal – Animals that share human food and lodgings, such as rats, mice cats and dogs.
Endangered – Listed and protected under the Endangered Species Act of 1973, as amended (ESA) as an endangered species
Endemic – Native to the Hawaiian Islands and unique to Hawai'i
Indigenous – Native to the Hawaiian Islands, but also found elsewhere naturally
Nocturnal – Night-time, after dark
'Ōpe'ape'a – Endemic endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*)
Pelagic – An animal that spends its life at sea – in this case seabirds that only return to land to nest and rear their young
Phylogenetic – The evolutionary order that organisms are taxonomically arranged by
Taxa – a taxonomic group of any rank, such as a species, family, or class
Threatened – Listed and protected under the ESA as a threatened species

DLNR – Hawai'i State Department of Land & Natural Resources
DOFAW – Division of Forestry and Wildlife
ESA – Federal Endangered Species Act of 1973, as amended
USFWS – United State Fish & Wildlife Service

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Appendix D
Traffic Impact Analysis Report

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

TAX MAP KEY: (1) 6-6-004: 13-19, 27, 28, & 32

PREPARED FOR

GROUP 70 INTERNATIONAL, INC.

MAY 12, 2011

PREPARED BY

TMC

THE TRAFFIC MANAGEMENT CONSULTANT

TRAFFIC IMPACT ANALYSIS REPORT

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TRAFFIC IMPACT ANALYSIS REPORT
FOR THE PROPOSED
HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT
HALE`IWA, HAWAII
TAX MAP KEY: (1) 6-6-004: 13-19, 27, 28, & 32

I. Introduction

A. Project Description

Kamehameha Schools is proposing to redevelop its existing commercial properties in Hale`iwa, Oahu, Hawaii, which includes Matsumoto and Aoki Shave Ice Stores. Kamehameha Schools will be seeking a change of zone to Community Business District (B-2). The properties are identified as Tax Map Key: (1) 6-6-004: 13-19, 27, 28, & 32. The 4.22-acre site is located on the makai (north) side of Kamehameha Highway between Kewalo Lane and Mahaulu Lane in Hale`iwa Town. Figure 1 depicts the project location.

The existing site consists of retail stores, a restaurant, a church, a water irrigation company (ITC Water Management, Inc.), and unpaved parking lots. The existing site access is provided by four (4) driveways on Kamehameha Highway to the gravel parking areas, Kewalo Lane, and Mahaulu Lane. The existing building areas total about 13,600 square feet of gross floor area (SFGFA). Table 1 summarizes the existing gross floor areas.

Table 1. Existing Hale`iwa Commercial Development

Land Use	Existing (SFGFA)
Retail	3,160
Restaurant	1,250
Food and Beverage	3,506
Light Industrial	3,573
Church	2,100
Totals	**13,589**

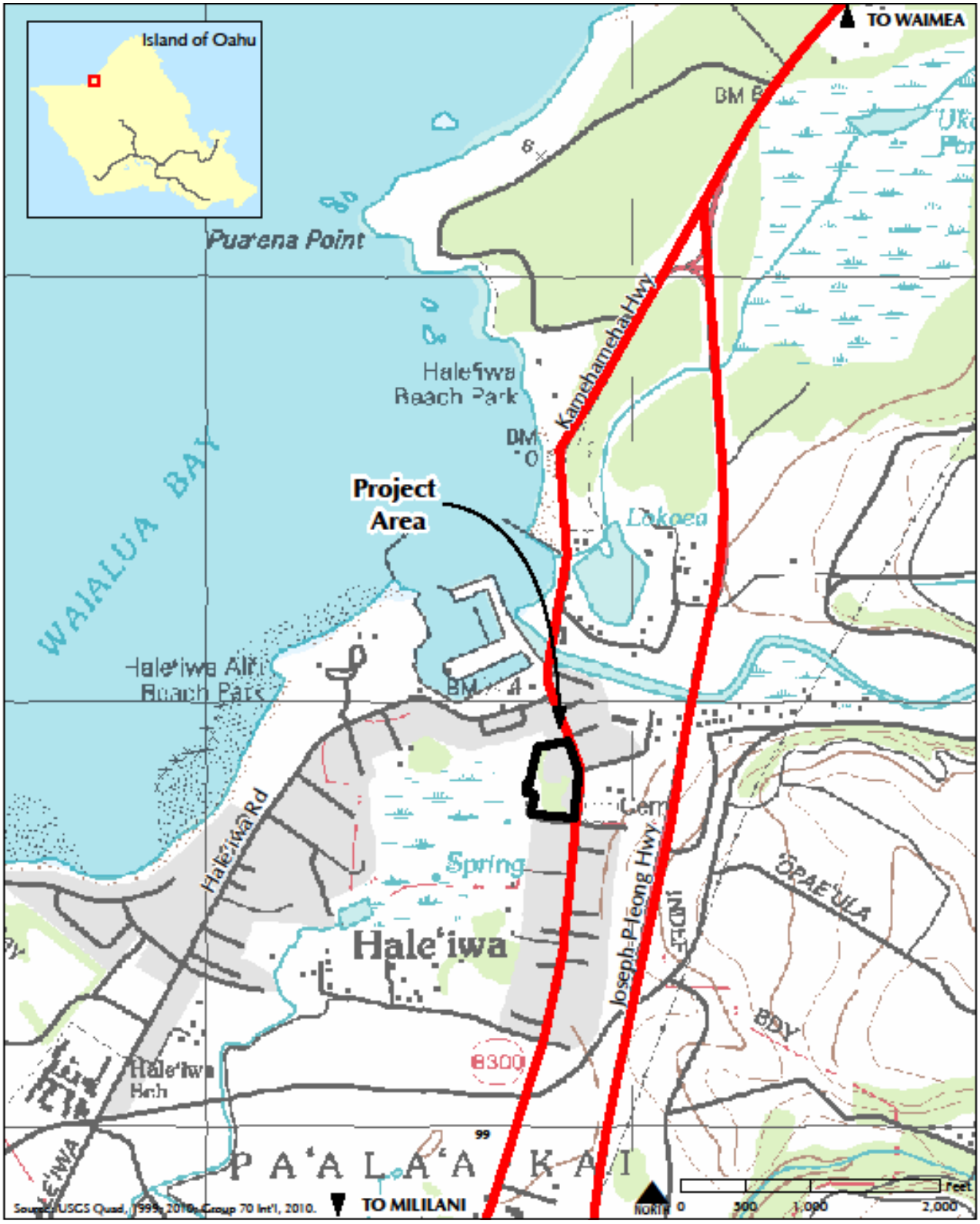


Figure 1. Location Map

The proposed project will include the demolition of dilapidated commercial buildings and the construction of new buildings, a paved parking lot, and the installation of necessary infrastructure to support the redevelopment. The redevelopment will expand the retail frontage with a combination of new storefronts and the reconstruction of existing historic establishments. Access to the proposed paved parking lot, which will be located in the rear of the site, will be provided from Kewalo Lane and Mahaulu Lane. The four (4) existing accesses on the makai side of Kamehameha Highway will be eliminated. The proposed redevelopment project will contain about 32,000 SFGFA and 112 parking stalls. The redevelopment project is expected to be completed by the Year 2014.

Table 2 summarizes the proposed redevelopment plan in terms of square feet of gross building area (SFGBA), square feet of gross leasable area (SFGLA), and square feet of gross floor area (SFGFA), which includes the building area and the opening dining areas.

Table 2. Proposed Hale`iwa Commercial Redevelopment Plan

Retail	**SFGBA**	**SFGLA**	**SFGFA**
Retail 1 (Aoki Shave Ice)	6,509	6,300	6,509
Retail 2	1,324	1,254	1,324
Retail 3	1,320	1,255	1,320
Retail 4	2,551	2,500	2,551
Retail 5	1,695	1,600	1,695
Retail 6	611	611	611
Hale`iwa Eats (Retail)	1,250	1,250	1,250
Retail Totals	**15,260**	**14,770**	**15,260**
Food & Beverage			
Matsumoto Shave Ice (Existing)	1,296	1,296	3,225
Matsumoto Lanai	442	442	
Matsumoto Add on Retail Space	1,487	1,410	
Fruit Stand	550	500	550
Restaurant 1	2,623	2,500	2,623
Restaurant 2 (Global Creations)	1,612	1,612	3,512
Restaurant 2 (Add on)	1,061	1,000	
Restaurant Outdoor Dining	N/A	900	

Table 2. Proposed Hale`iwa Commercial Redevelopment Plan (Cont'd.)			
Food & Beverage	**SFGBA**	**SFGLA**	**SFGFA**
Restaurant 3	2,690	2,500	3,390
Restaurant 3 Outdoor Dining	N/A	700	
Food & Beverage Totals	**11,761**	**11,761**	**13,361**
Office	1,578	1,500	1,578
Support Area	1,571	N/A	1,571
Totals	**30,170**	**29,130**	**31,770**

The proposed site plan is depicted on Figure 2.

B. Purpose and Scope of the Study

The purpose of this study is to analyze the traffic impacts resulting from the proposed Hale`iwa Commercial Redevelopment Project. This report presents the findings and recommendations of the study. The scope of this study includes:

1. An evaluation of the existing roadway and traffic conditions.
2. The development of the trip generation characteristics of the existing commercial site.
3. The development of the trip generation characteristics of the redevelopment project.
4. An analysis of the future traffic conditions without the proposed redevelopment project.
5. The identification and analysis of traffic impacts resulting from the development of the full build-out of the proposed redevelopment project.
6. The development and evaluation of alternative traffic improvements, which would mitigate the traffic impacts identified in this study.

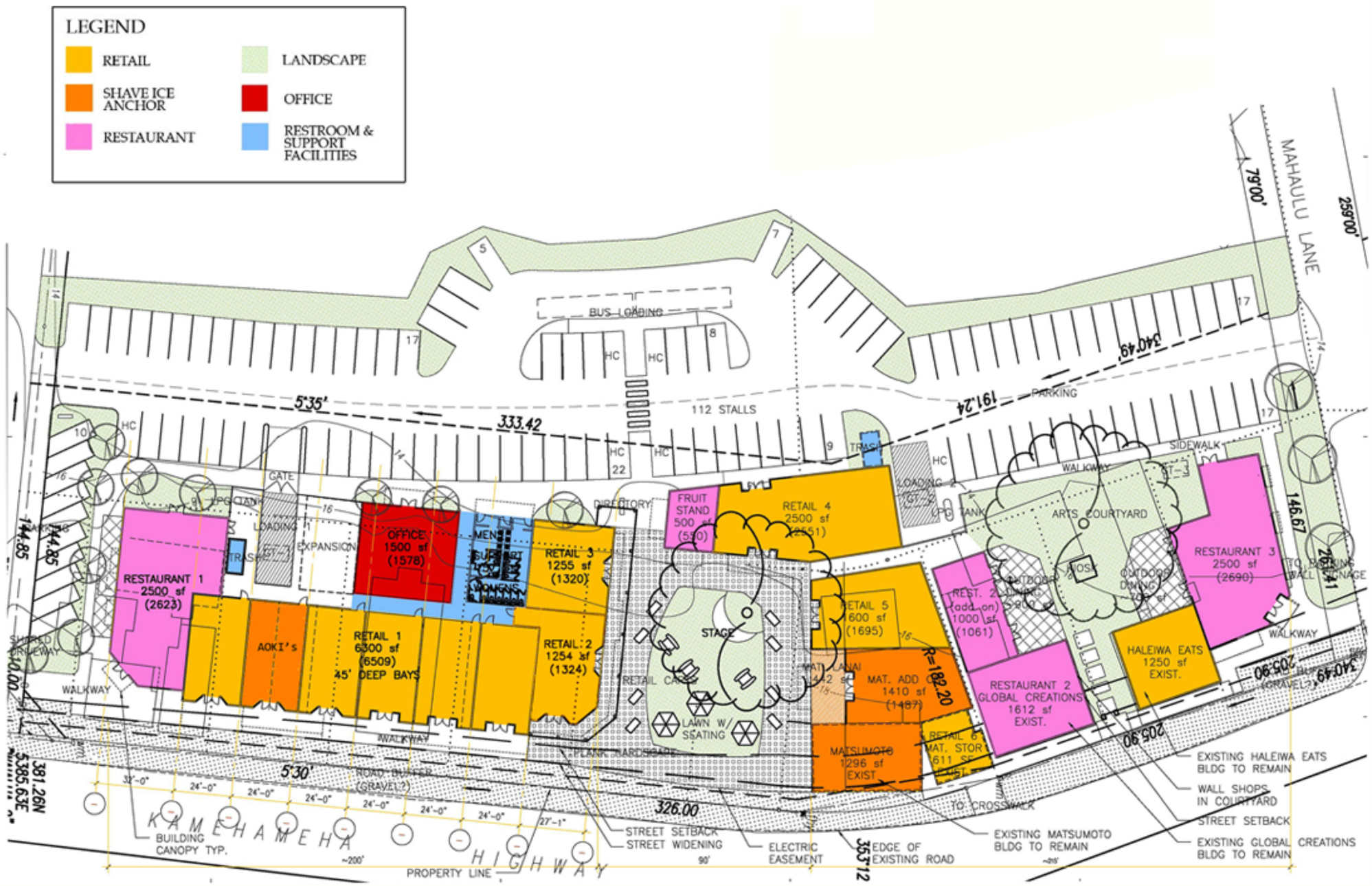


Figure 2. Proposed Site Plan

C. Methodologies

1. Capacity Analysis Methodology

The highway capacity analysis, performed for this study, is based upon procedures presented in the Highway Capacity Manual (HCM), published by the Transportation Research Board, 2000. HCM defines Level of Service (LOS) as "a quality measure describing operational conditions within a traffic stream". Several factors may be included in determining LOS, such as: speed, travel time, freedom to maneuver, traffic interruptions, driver comfort, and convenience. LOS's "A", "B", and "C" are considered satisfactory Levels of Service. LOS "D" is generally considered a "desirable minimum" operating level of service. LOS "E" is an undesirable condition, and LOS "F" is an unacceptable condition. Intersection LOS is primarily based upon average delay per vehicle, which is expressed in seconds per vehicle (sec/veh). Table 3 summarizes the LOS criteria.

Table 3. Level of Service Criteria (HCM)

LOS	Unsignalized Intersections Control Delay (sec/veh)
A	≤ 10
B	> 10 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Worksheets for the capacity analysis, performed throughout this report, are compiled in the Appendix.

2. Trip Generation Methodology

The trip generation methodology is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in Trip Generation, 8th Edition, 2008. ITE trip rates are developed by correlating the total vehicle trip generation data with various activity/land use characteristics, such as the vehicle trips per hour (vph) per 1,000 SFGFA. The trip generation characteristics for the proposed redevelopment project are based upon ITE trip rates for the respective land uses in the proposed development plan.

The ITE trip generation rates for a fast-food restaurant were applied to 25 percent of the Matsumoto Shave Ice Store and to the existing Aoki Shave Ice Store, since

their primary trip generation characteristics resembled a food and beverage land use rather than retail activity.

A percentage of the peak hour trips generated by a shopping center are considered "pass-by" trips, i.e., traffic already on the road stopping at a "secondary" destination. The percentages of pass-by trips were correlated with the gross leasable floor areas of the shopping centers that were taken from studies that were compiled by ITE. The results of the analysis were published in the Trip Generation Handbook. For the purpose of this analysis, the weekday peak hour pass-by rate of about 56 percent, and the weekend peak hour pass-by rate of 38 percent, was based upon the overall shopping center floor area.

II. Existing Conditions

A. Roadways

Kamehameha Highway is a two-way, two-lane, collector roadway in Hale`iwa Town. Kamehameha Highway does not provide exclusive left-turn lanes at Kewalo Lane, Emerson Street, or at Mahaulu Lane. The posted speed on Kamehameha Highway is 25 miles per hour (mph).

Kewalo Lane is a two-way, two-lane, private street, which provides access to the Hale`iwa Town Center and several residences. Kewalo Lane is stop-controlled at its Tee-intersection with Kamehameha Highway. Mahaulu Lane is a two-way, two-lane, private street, which provides access to several residences and a water irrigation company. Mahaulu Lane is stop-controlled at its Tee-intersection with Kamehameha Highway.

Emerson Street is a two-way, two-lane, local street, which provides access to several residences and a baseyard. Emerson Street is stop-controlled at its Tee-intersection with Kamehameha Highway, opposite Matsumoto Shave Ice Store.

B. Existing Peak Hour Traffic Volumes and Operating Conditions

1. Field Investigation and Data Collection

Traffic count surveys were conducted on Kamehameha Highway at Emerson Street, on Tuesday, November 16, 2010, during the PM peak period of weekday traffic, from 2:00 PM to 5:00 PM; and on Sunday, November 14, 2010, during the peak period of weekend traffic, from 1:30 PM to 4:30 PM. Traffic count surveys also were conducted on Kamehameha Highway at Kewalo Lane, Emerson Street, and at Mahaulu Lane, during the PM peak hour of weekday traffic, and during the weekend peak hour of traffic. The weekday PM and Sunday peak period of traffic data are presented in the Appendix.

The AM peak period of traffic was not surveyed since most of the commercial activities at the proposed redevelopment project are not expected to be open during the AM commuter peak period, e.g., Matsumoto Shave Ice Store opens at 10:00 AM. Furthermore, a review of historical traffic data, which were obtained from the State

Department of Transportation, indicated that there was no apparent commuter peak period of traffic on Kamehameha Highway in the morning. The DOT data also indicated little variation between Saturday and Sunday peak hour traffic volumes on Kamehameha Highway in Haleiwa.

2. Existing Weekday PM Peak Hour Traffic

The PM peak hour of weekday traffic occurred between 3:15 PM and 4:15 PM. During the existing PM peak hour of weekday traffic, Kamehameha Highway carried about 900 vehicles per hour (vph), total for both directions. Kewalo Lane carried 66 vph, total for both directions, while Emerson Street carried 34 vph. Mahaulu Lane was a low volume roadway during the PM peak hour of weekday traffic.

During the existing PM peak hour of weekday traffic, Kewalo Lane, Emerson Street, and Mahaulu Lane operated at LOS "C" at their respective intersections with Kamehameha Highway. Traffic flow on Kamehameha Highway was slow moving due to turning traffic, pedestrians crossing Kamehameha Highway, and vehicles parking on Kamehameha Highway. About 40 pedestrians were observed crossing Kamehameha Highway at Emerson Street, during the PM peak hour of weekday traffic. The existing weekday PM peak hour traffic volumes are depicted on Figure 3.

3. Existing Weekend Peak Hour Traffic

The weekend peak hour of traffic on Kamehameha Highway occurred between 2:30 PM and 3:30 PM. Kamehameha Highway carried about 1,100 vph, during the existing peak hour of weekend traffic. Kewalo Lane carried 58 vph, while Emerson Street carried 50 vph. Mahaulu Lane was a low volume roadway during the peak hour of weekend traffic.

Kewalo Lane, Emerson Street, and Mahaulu Lane operated at LOS "C" at their respective intersections with Kamehameha Highway, during the peak hour of weekend traffic. Traffic flow on Kamehameha Highway was slow moving due to turning traffic, pedestrians crossing Kamehameha Highway, and vehicles parking on Kamehameha Highway. About 125 pedestrians were observed crossing Kamehameha Highway at Emerson Street, during the peak hour of weekend traffic. Figure 4 depicts the existing weekend peak hour traffic volumes.

III. Future Traffic Conditions

A. Background Growth in Traffic

The population and employment forecasts for Oahu were published in the Oahu Regional Transportation Plan 2030, by the Oahu Metropolitan Planning Organization in April 2006. Over a 25-year period, the population of the North Shore of Oahu is expected to increase by 5 percent, while no growth in employment is projected. For the purpose of this analysis, a background growth in traffic of 0.5 percent per year was assumed. A growth factor of 1.02 was uniformly applied to the existing peak hour traffic demands to estimate the Year 2014 peak hour traffic demands without the proposed redevelopment project.

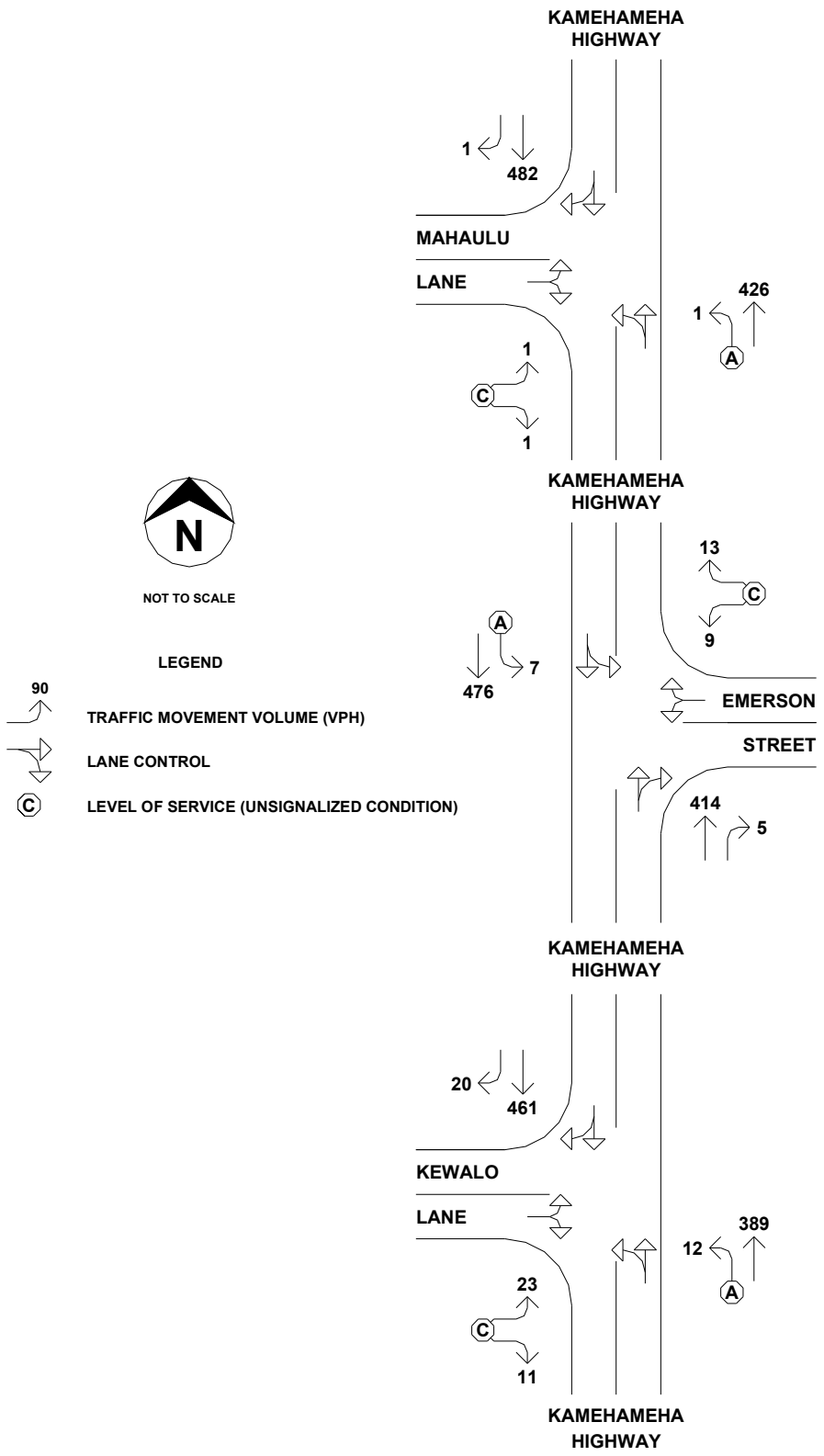


Figure 3. Existing Weekday PM Peak Hour Traffic

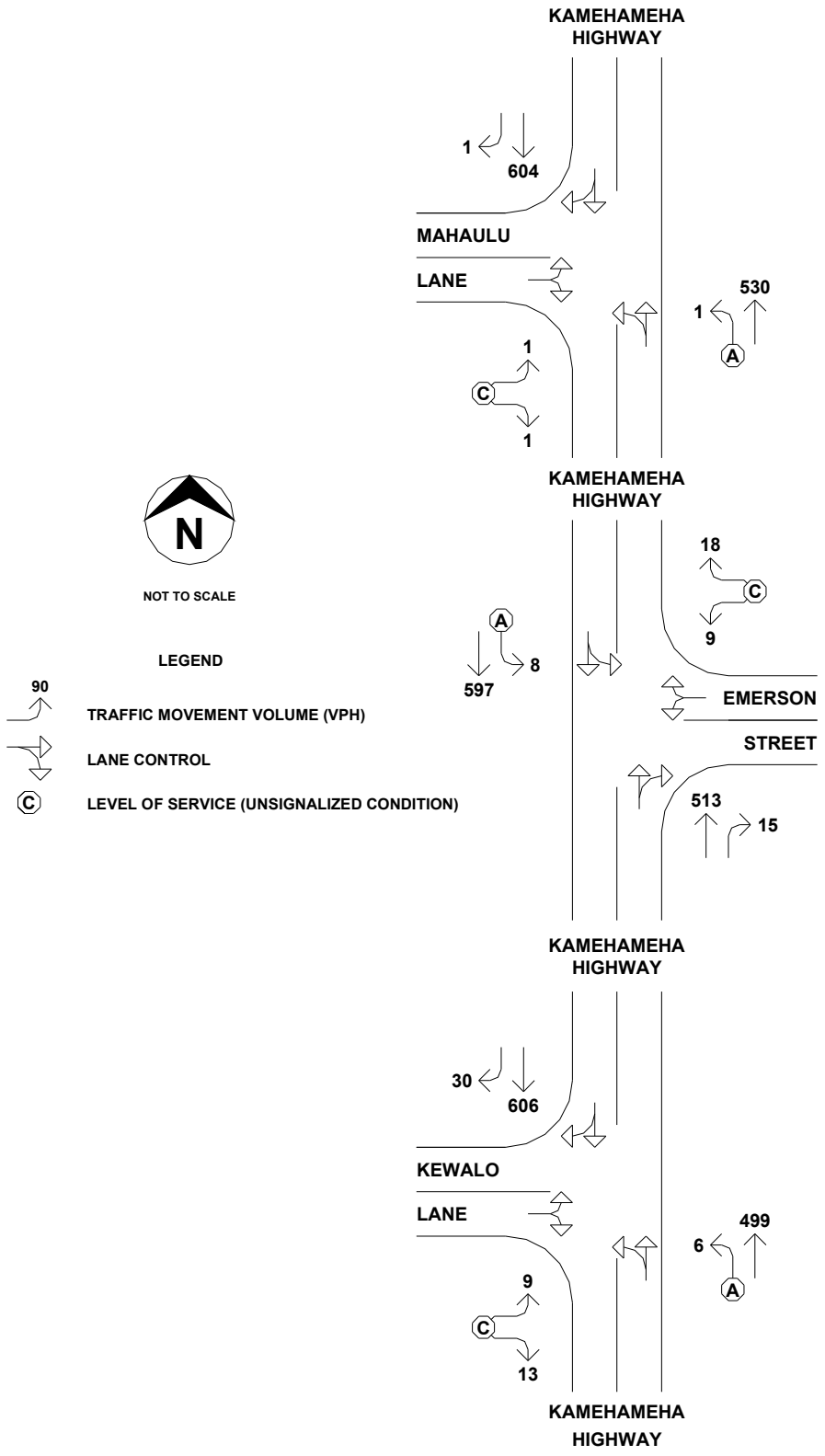


Figure 4. Existing Weekend Peak Hour Traffic

B. Year 2014 PM Peak Hour Traffic Analysis Without Project

During the PM peak hour of weekday traffic without the proposed redevelopment project, the Kamehameha Highway intersections within the study area are expected to operate at LOS "C". Figure 5 depicts the PM peak hour weekday traffic without the proposed redevelopment project.

C. Year 2014 Weekend Peak Hour Traffic Analysis Without Project

The Kamehameha Highway intersections within the study area are expected to continue to operate at LOS "C", during the weekend peak hour of traffic without the proposed redevelopment project. The weekend peak hour traffic without the proposed redevelopment project is depicted on Figure 6.

IV. Traffic Impact Analysis

A. Trip Generation

1. Existing Trip Generation Characteristics

The existing site trips was primarily generated by the Matsumoto and Aoki Shave Ice Stores. The existing parking lot was at capacity for most of the peak hour of traffic. Customers parked on the surrounding streets or nearby parking lots and walked into the Shave Ice Stores. Therefore, it was difficult to estimate the existing vehicle trip generation. For the purpose of this traffic impact analysis, the existing trip generation was estimated using the ITE trip rates for the respective land uses. The existing trip generation characteristics are summarized in Table 4.

Table 4. Existing Trip Generation Summary

Land Use (ITE Code)	Vehicles Per Hour					
	PM Peak Hour			Weekend Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
Matsumoto & Aoki Shave Ice (933)	46	44	90	62	67	129
Existing Retail (820)	37	40	77	8	8	16
ITC (110)	1	3	4	0	0	0
Hale`iwa Eats (932)	8	6	14	13	10	23
Existing Site Trips	92	93	185	83	85	168
Existing Pass-By Trips	57	57	114	32	32	64
Net Existing Trips (Site – Pass-By)	34	33	67	51	53	104

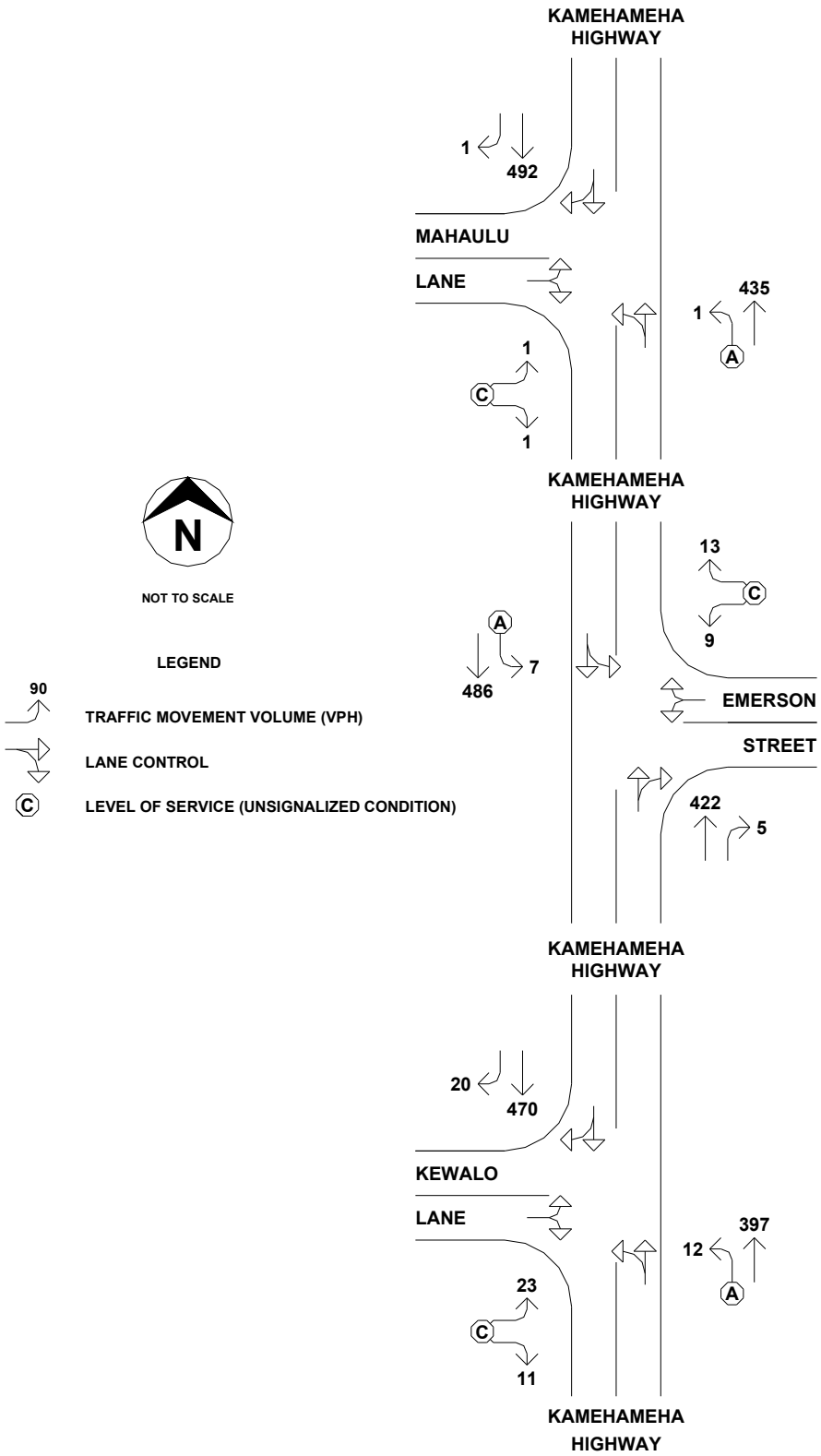


Figure 5. Weekday PM Peak Hour Traffic Without Project

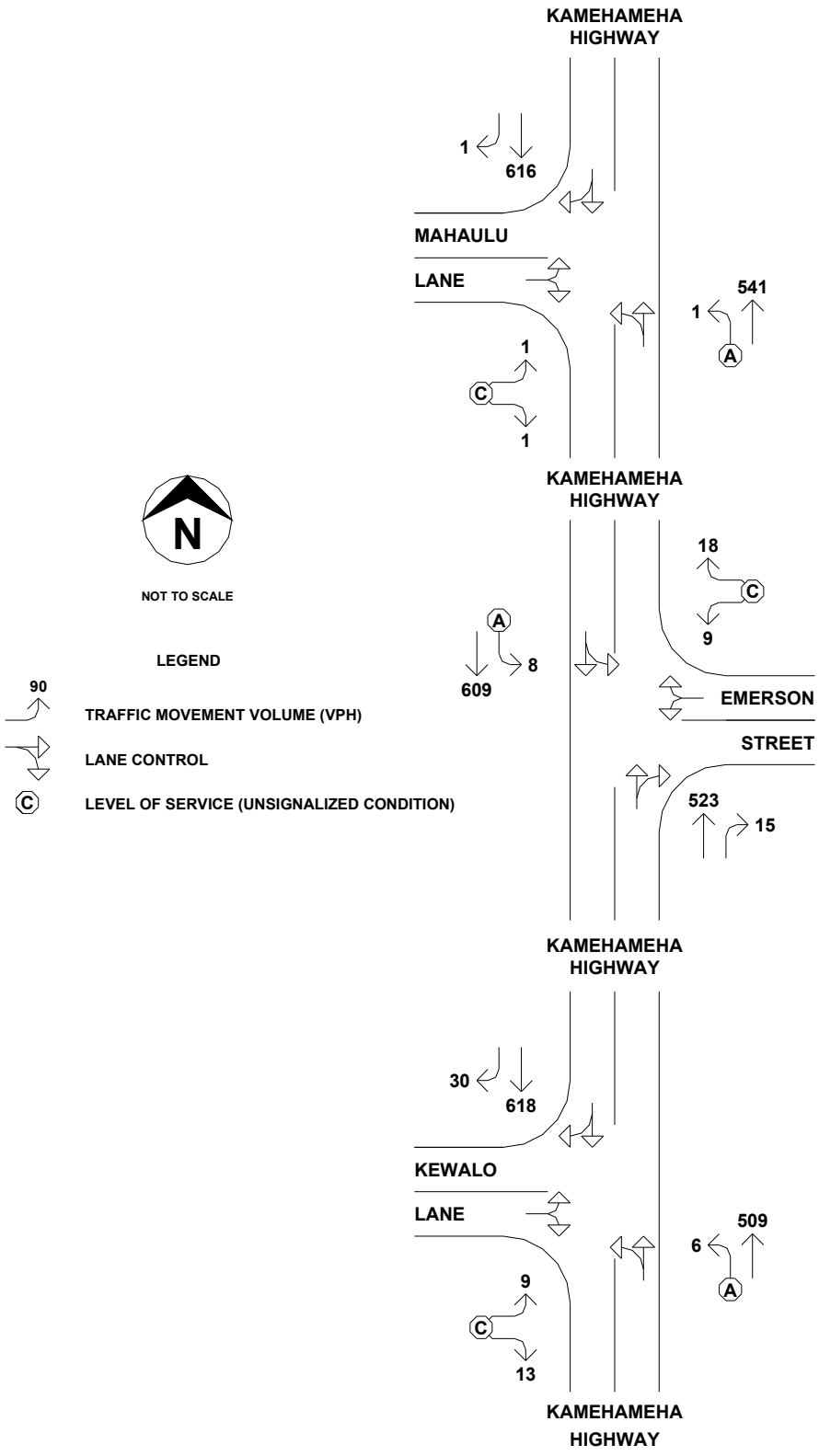


Figure 6. Weekend Peak Hour Traffic Without Project

2. Proposed Redevelopment Trip Generation Characteristics

The increase in trip generation resulting from the proposed redevelopment is expected to be the difference between the proposed redevelopment site trip generation and the existing site trip generation. The proposed redevelopment is expected to result in net increases of 163 vph, during the PM peak hour of weekday traffic; and 179 vph, during the peak hour of weekend traffic. The proposed redevelopment trip generation characteristics are summarized in Table 5.

Table 5. Redevelopment Trip Generation Summary

Land Use (ITE Code)	Vehicles Per Hour					
	PM Peak Hour			Weekend Peak Hour		
	Enter	Exit	Total	Enter	Exit	Total
Matsumoto & Aoki Shave Ice (933)	103	66	202	120	130	250
Retail (820)	69	71	140	22	23	45
Office (710)	0	2	2	1	0	1
High-Turnover Restaurants (932)	41	28	69	63	51	114
Quality Restaurant (931)	19	12	31	18	11	29
Total Site Trips	232	212	444	224	215	439
Pass-By Trips	105	105	210	78	78	156
Net Proposed Trips (Site – Pass-By)	127	107	234	146	137	283
Net Increase (Proposed – Existing)	92	71	163	95	84	179

B. Alternative Schemes

Four (4) alternative schemes were developed to mitigate the expected traffic impacts at the Kamehameha Highway intersections at Kewalo Lane and Mahaulu Lane.

1. Scheme 1

Scheme 1 is based upon the future road widening of Kamehameha Highway in Hale`iwa Town. Scheme 1 consists of a 60-foot wide right-of-way with a 34-foot wide travelway, which will provide for two 12-foot wide through lanes (one lane in each direction), a 10-foot wide median left-turn lane, and 13-foot wide shoulders on both sides of the Highway. Under Scheme 1, Kamehameha Highway will be widened to provide a 34-foot wide travelway and a 13-foot wide shoulder along the entire frontage of the project. The road widening will extend beyond the project frontage to

provide for 80 foot-long left-turn storage lanes at Kewalo Lane and at Mahaulu Lane. A 40 foot-long left-turn lane also will be provided at Emerson Street. Median shelter lanes also will be provided at Kewalo Lane (50 feet in length) and at Mahaulu Lane (80 feet in length). The median shelter lane at Mahaulu Lane is extended to 80 feet to provide an option for a two-way, left-turn median lane to facilitate left-turn movements to and from Anahulu Place. The design speed under Scheme 1 is 30 mph. Figure 7 depicts Scheme 1.

2. Scheme 2

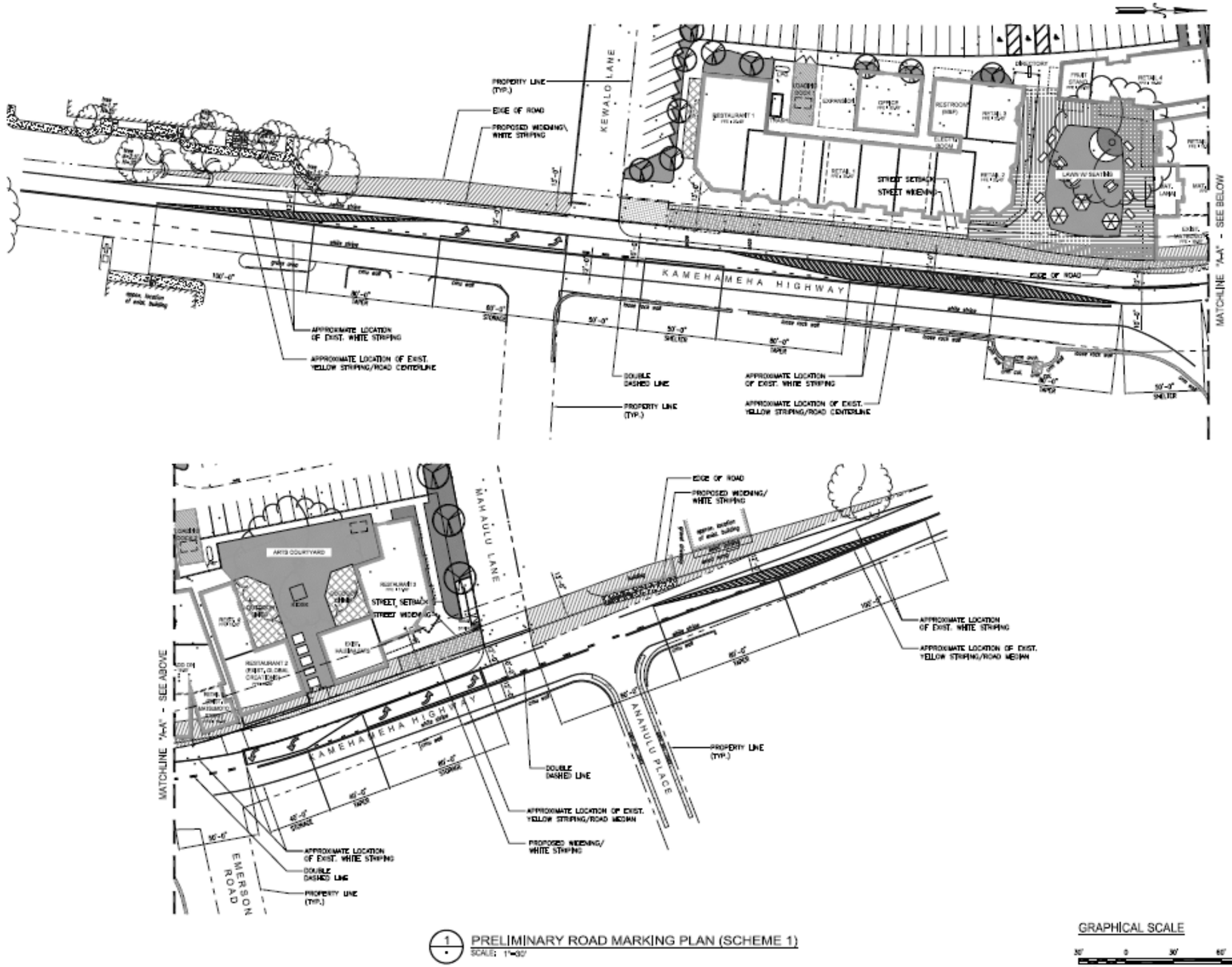
The Scheme 2 improvements at the intersection of Kamehameha Highway and Kewalo Lane are identical to Scheme 1. Because Scheme 1 is expected to severely impact several existing buildings between the Matsumoto Shave Ice Store and Mahaulu Lane, the City has reduced its requirement for a 13-foot wide shoulder to an 8-foot wide shoulder with a raised curb at the edge of pavement, where the widening will occur along the existing buildings that are expected to remain. The left-turn and median shelter lanes on Kamehameha Highway at Mahaulu Lane are reduced from 80 feet to 50 feet to minimize the length of the road widening. Furthermore, because the proposed improvements will affect properties to the north of Mahaulu Lane, which are not owned by Kamehameha Schools, the City also has reduced it requirement of a 10-foot wide median lane to a 9-foot wide median lane. Finally, the City has reduced its design speed on Kamehameha Highway, north of Mahaulu Lane, from 30 mph to 25 mph. Scheme 2 is depicted on Figure 8.

3. Scheme 3

Scheme 3 includes traffic improvements on Kamehameha Highway at Kewalo Lane along the Kamehameha Schools' properties, which include Hale`iwa Town Center, located immediately to the west of the project site. No improvements are provided in the vicinity of Mahaulu Lane to avoid adversely affecting existing buildings. Scheme 3 provides a 100 foot-long left-turn lane and a 50 foot-long median shelter lane on Kamehameha Highway at Kewalo Lane. The left-turn lane on Kamehameha Highway is extended from 80 feet to 100 feet, and separate left-turn and right-turn lanes are provided on Kewalo Lane, in anticipation of the increase in traffic demand at the intersection. Scheme 3 is analyzed with unrestricted access at Mahaulu Lane, since it serves several residences on Mahaulu Lane. Furthermore, a second left-turn opportunity from Kamehameha Highway is desirable for the proposed shopping center. Figure 9 depicts Scheme 3.

4. Scheme 4

Scheme 4 includes the same traffic improvements at the intersection of Kamehameha Highway and Kewalo Lane, described under Scheme 3. In addition, a 50 foot-long left-turn lane is provided on Kamehameha Highway at Mahaulu Lane. Kamehameha Schools does not own the properties to the north of Mahaulu Lane. Therefore, a median shelter lane at Mahaulu Lane is not included in Scheme 4. Scheme 4 is depicted on Figure 10.



1 PRELIMINARY ROAD MARKING PLAN (SCHEME 1)
SCALE: 1"=30'

GRAPHICAL SCALE
30' 0 30' 60' 90'
SCALE: 1"=30'

Figure 7. Scheme 1

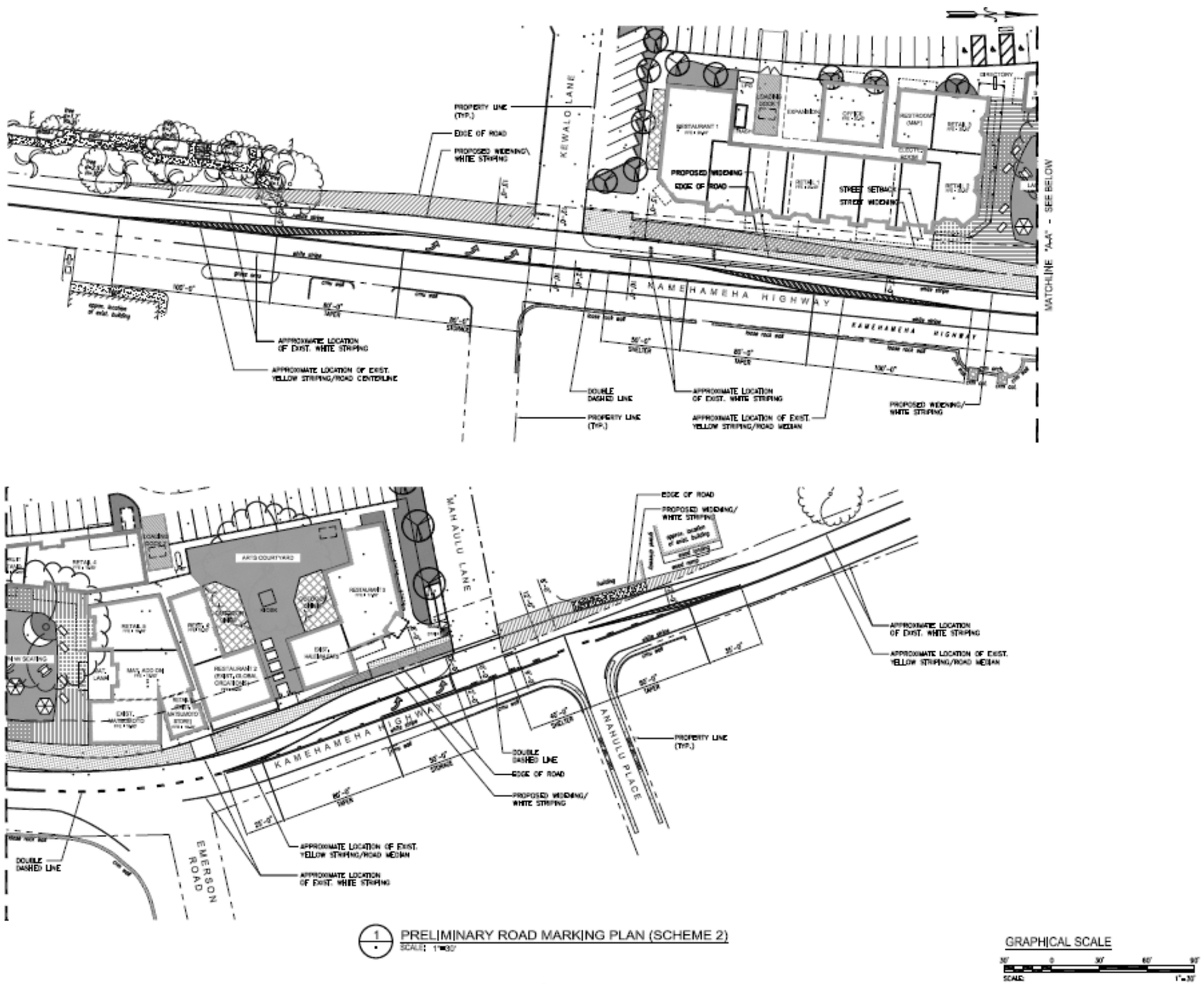


Figure 8. Scheme 2

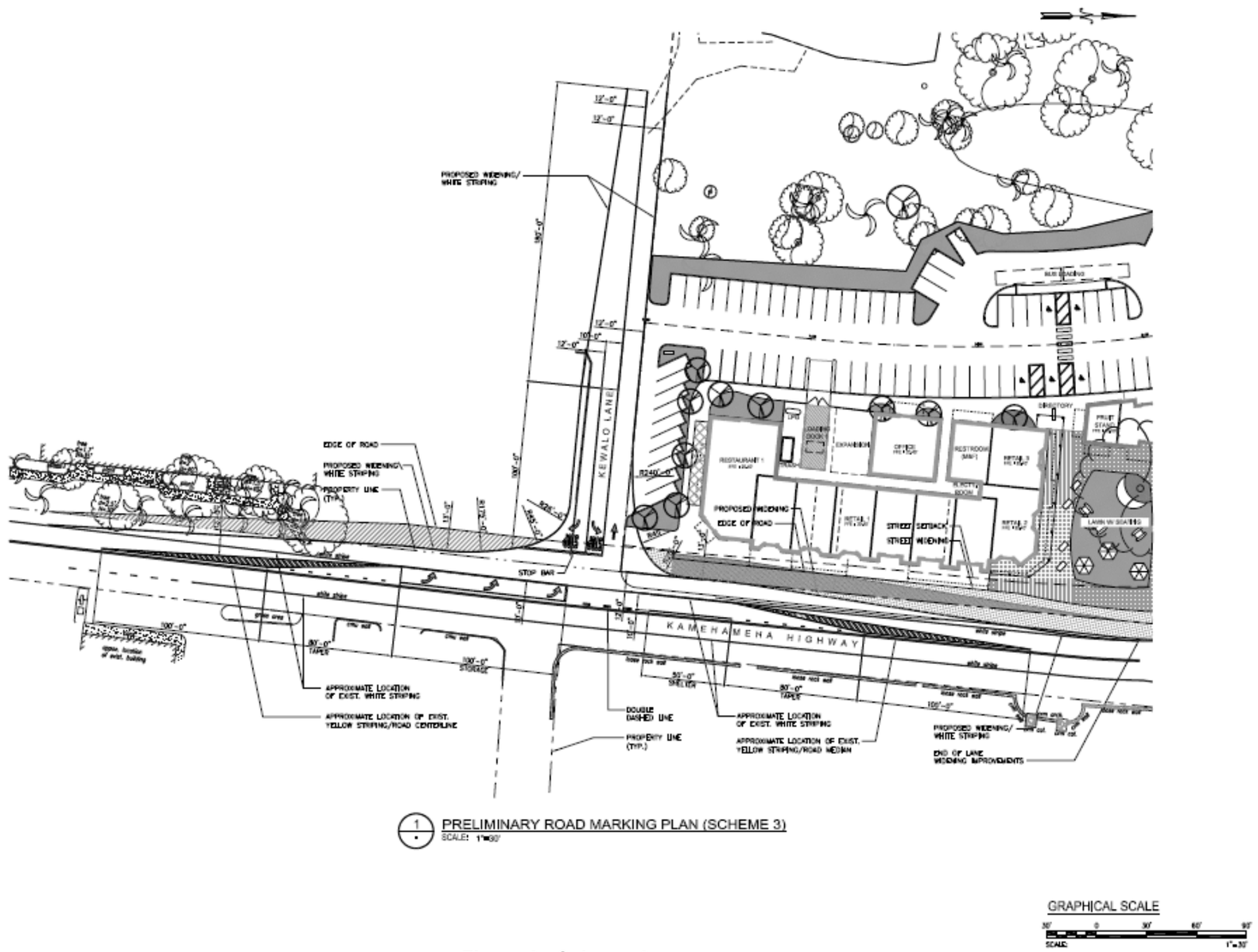


Figure 9. Scheme 3

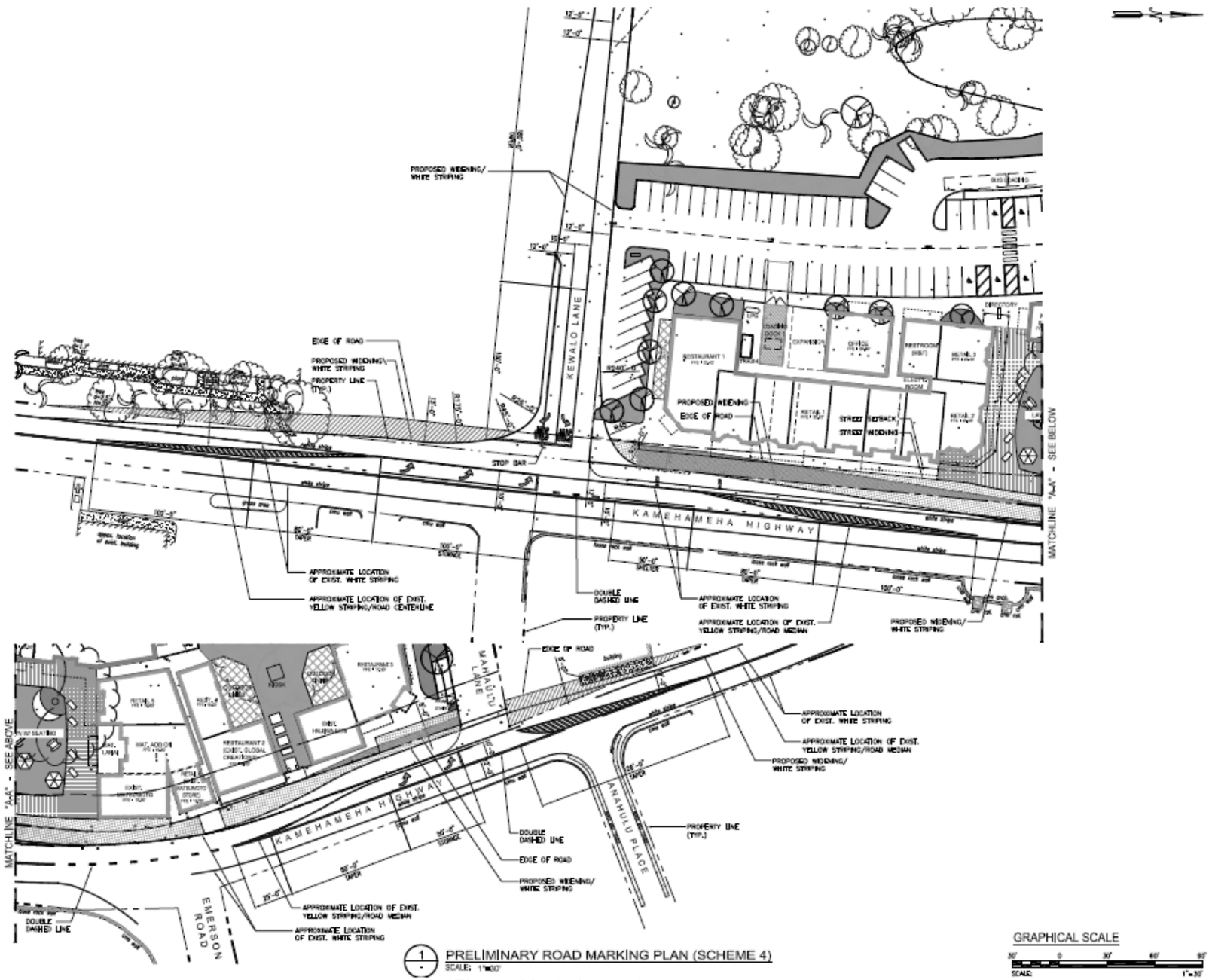


Figure 10. Scheme 4

C. Trip Distribution

The trip distribution is based upon existing traffic patterns. Figures 11 and 12 depict the PM and the weekend peak hour traffic assignments resulting from the proposed redevelopment project, respectively.

D. Year 2014 Weekday PM Peak Hour Traffic Impact Analysis With Project

Without any roadway improvements, Kewalo Lane and Mahaulu Lane are expected to operate at LOS "D" at Kamehameha Highway, during the PM peak hour of weekday traffic with the proposed redevelopment project. Emerson Street is expected to operate at LOS "C" at Kamehameha Highway.

Under Schemes 1, 2, 3, and 4, the traffic operations at the intersection of Kamehameha Highway and Kewalo Lane are expected to improve to LOS "C". Traffic operations on Mahaulu Lane at Kamehameha Highway also are expected to improve to LOS "C" under Schemes 1 and 2. An additional reduction in delay for traffic on Kewalo Lane, turning onto Kamehameha Highway, is expected under Schemes 3 and 4, due to the provisions for separate left-turn and right-turn lanes. Schemes 1, 2, and 4 are expected to reduce delay to northbound through traffic at Mahaulu Lane by providing a separate left-turn lane on Kamehameha Highway. Under Schemes 3 and 4, Mahaulu Lane is expected to continue to operate at LOS "D". The PM peak hour traffic with the proposed redevelopment project is depicted on Figure 13.

E. Year 2014 Weekend Peak Hour Traffic Impact Analysis With Project

During the weekend peak hour of traffic with the proposed redevelopment project, Kewalo Lane and Mahaulu Lane are expected to operate at LOS "D" and LOS "E", respectively, at Kamehameha Highway under the existing roadway geometrics. Emerson Street is expected to operate at LOS "C" at Kamehameha Highway.

The traffic operations at the intersection of Kamehameha Highway and Kewalo Lane are expected to improve to LOS "C" under all the alternative Schemes. A further improvement in delays for traffic on Kewalo Lane, turning onto Kamehameha Highway, is expected under Schemes 3 and 4. Traffic operations on Mahaulu Lane at Kamehameha Highway also are expected to improve to LOS "C" under Schemes 1 and 2. Mahaulu Lane is expected to continue to operate at LOS "E" under Schemes 3 and 4. Schemes 1, 2, and 4 are expected to reduce delay to northbound through traffic at Mahaulu Lane by separating the left-turn and through traffic. Figure 14 depicts the weekend peak hour traffic with the proposed redevelopment project.

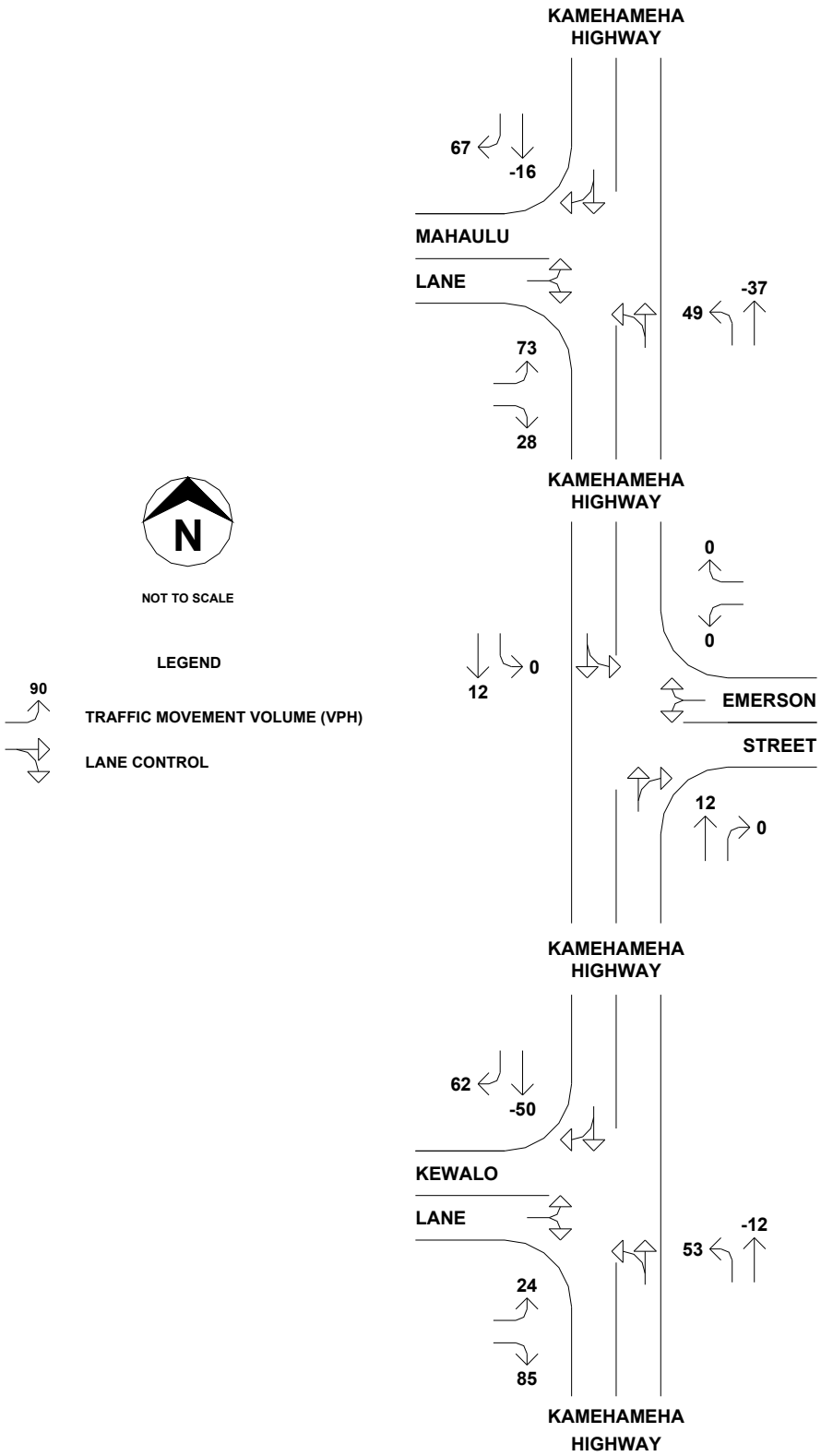


Figure 11. Weekday PM Peak Hour Traffic Assignment

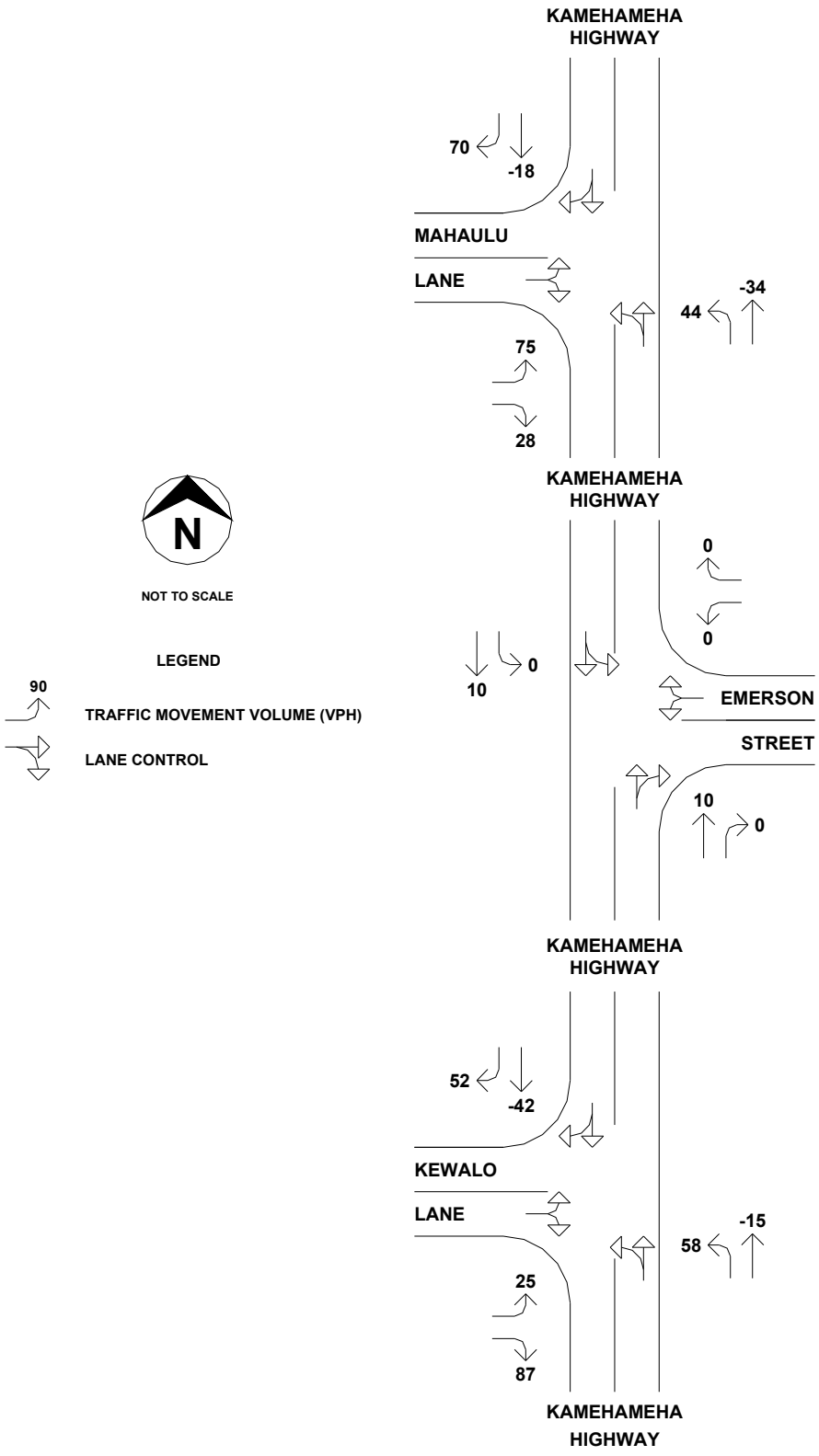


Figure 12. Weekend Peak Hour Traffic Assignment

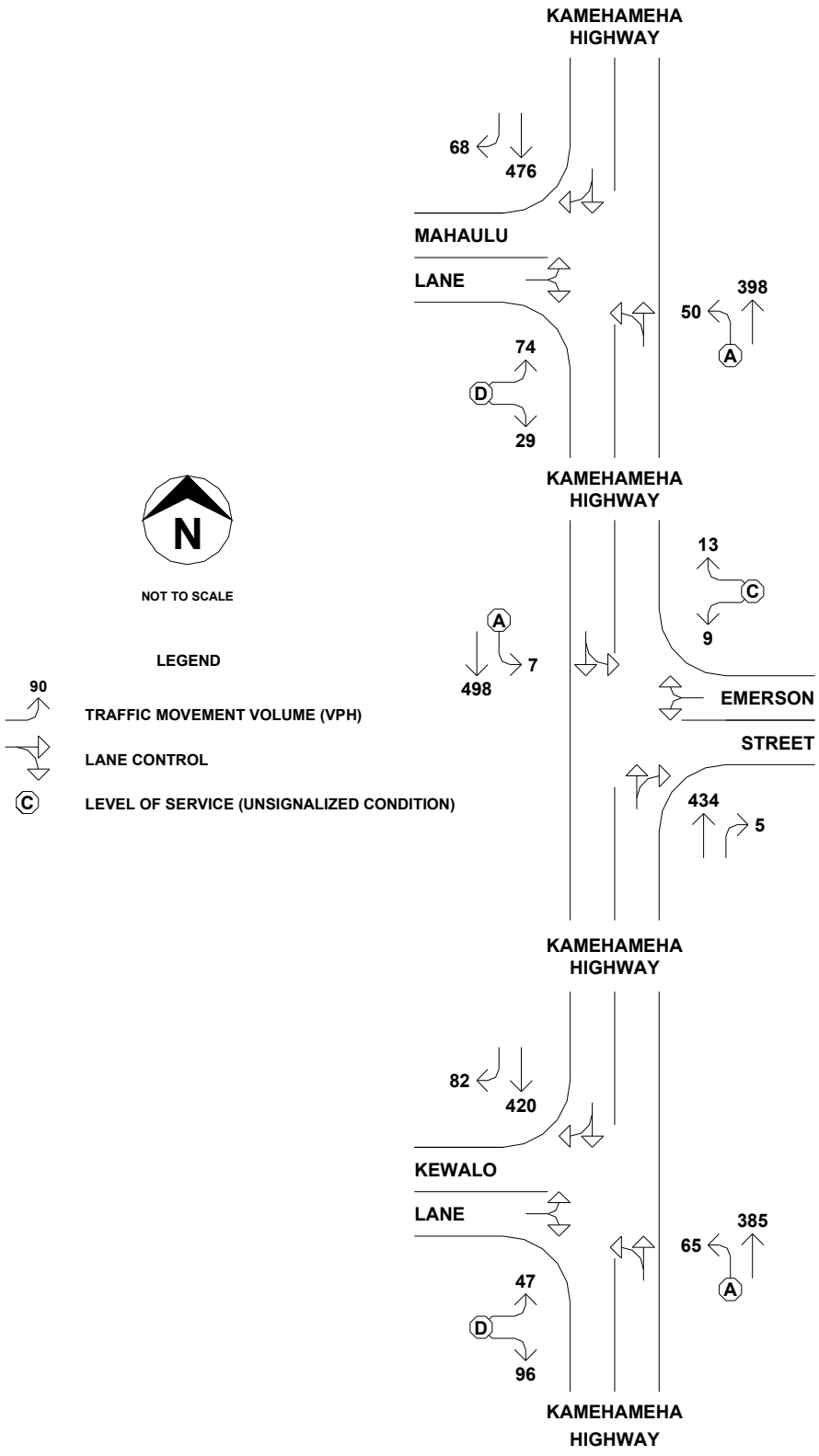


Figure 13. Weekday PM Peak Hour Traffic With Project

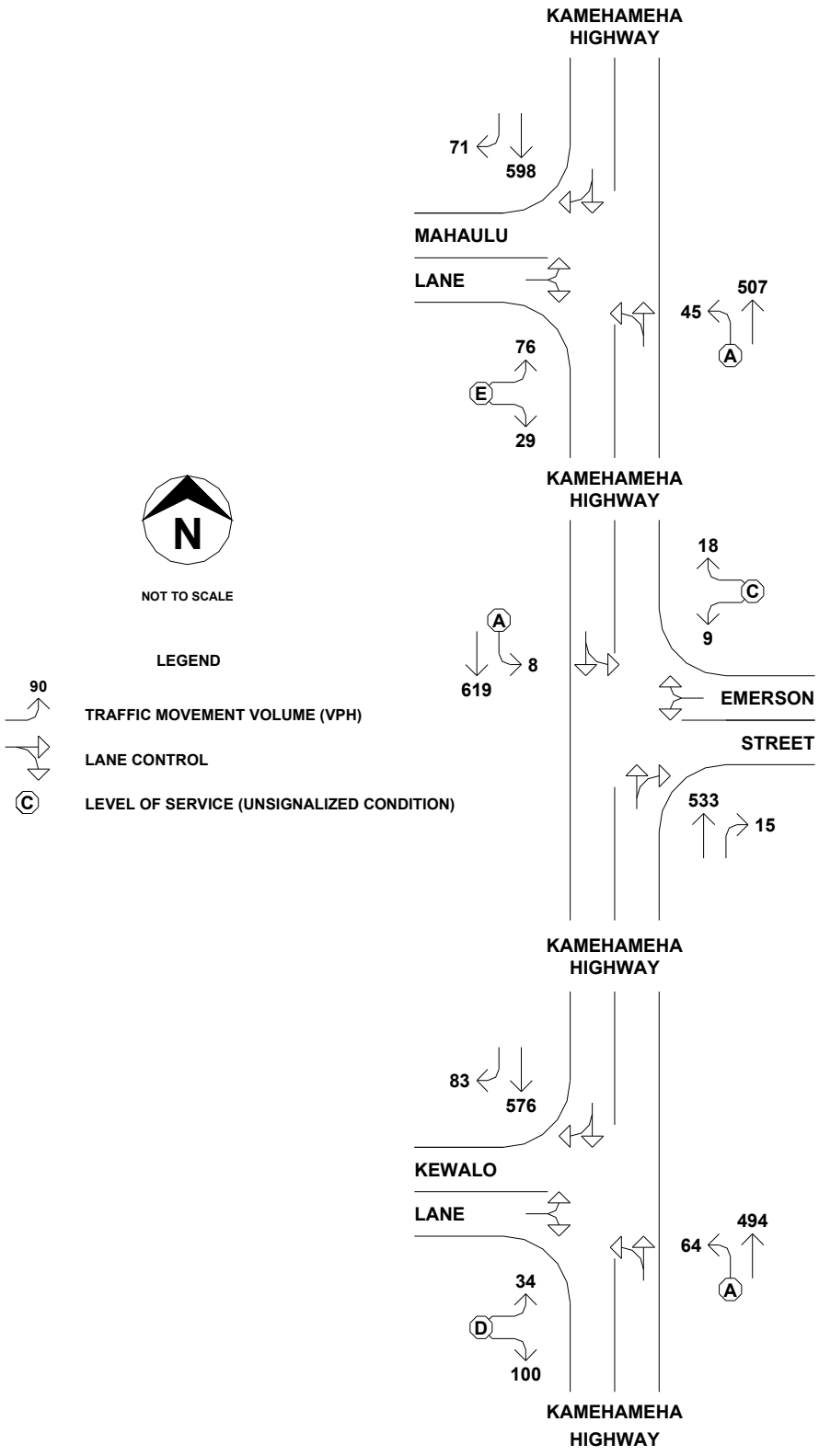


Figure 14. Weekend Peak Hour Traffic With Project

V. Alternative Improvements and Conclusions

A. Alternative Roadway Improvements

1. Kamehameha Highway should be widened to provide an exclusive left-turn lane in the northbound direction at Kewalo Lane to minimize delay to through traffic (Schemes 1 through 4).

2. Kamehameha Highway should be widened to a median shelter lane in the northbound direction at Kewalo Lane to mitigate LOS "D" conditions, which are expected during the weekend peak hour of traffic with the proposed redevelopment project. The recommended improvements are expected to result in LOS "C" conditions on Kewalo Lane (Schemes 1 through 4).

3. Kewalo Lane should be widened to provide separate left-turn and right-turn lanes (Schemes 3 and 4).

4. Kamehameha Highway should be widened to provide an exclusive left-turn lane in the northbound direction at Mahaulu Lane to minimize delay to through traffic (Schemes 1, 2, and 4).

5. Kamehameha Highway should be widened to provide a median shelter lane in the northbound direction at Mahaulu Lane to mitigate LOS "E" conditions, which are expected during the weekend peak hour of traffic with the proposed redevelopment project. The recommended improvements are expected to result in LOS "C" conditions on Mahaulu Lane (Schemes 1 and 2).

B. Conclusions

The proposed redevelopment of the Hale`iwa Commercial Project is expected to improve traffic and pedestrian flows along Kamehameha Highway by eliminating multiple access points along the project frontage, reducing the on-street parking, and consolidating site access to two existing intersections, which are adjacent to the property. However, the diversion of site traffic to Kewalo Lane and Mahaulu Lane is expected to create additional delays at these intersections.

The increases in traffic generated from the proposed redevelopment project are expected to result in LOS "D" conditions on Kewalo Lane and on Mahaulu Lane at Kamehameha Highway, during the PM peak hour of weekday traffic. Kewalo Lane and Mahaulu Lane are expected to operate at LOS "D" and LOS "E", respectively, during the weekend peak hour of traffic. The roadway improvements under all the alternative Schemes are expected to mitigate the traffic impacts on Kamehameha Highway at Kewalo Lane, and result in LOS "C" conditions.

The alternative improvements on Kamehameha Highway at Mahaulu Lane under Schemes 1 and 2 are expected to result in LOS "C" conditions. Scheme 3 does not mitigate the traffic impacts the Mahaulu Lane intersection. The Scheme 4 improvements at Mahaulu Lane are expected to only mitigate the delay to northbound traffic on

Kamehameha Highway by providing a separate left-turn lane. Mahaulu Lane is expected to continue to operate at LOS "D" and "E", during the weekday PM and weekend peak hours of traffic, respectively. The alternative improvements at the intersection of Kamehameha Highway and Mahaulu Lane are subject to the topographic survey, which will be conducted during the design phase of the development.

The slow-moving and stop-and-go traffic through Hale`iwa Town is most apparent along the existing project site, where there are several driveways and side streets, no provisions for left-turn lanes, and parking along Kamehameha Highway. When the makai parking areas are at capacity, customers park on Emerson Street and along the mauka side of Kamehameha Highway. The resulting pedestrian traffic across Kamehameha Highway creates additional delay to through traffic and poses potential safety concerns. The proposed parking lot will be located to the rear of the redeveloped site with accesses from Kewalo Lane and Mahaulu Lane. The existing access driveways along Kamehameha Highway will be closed. The proposed redevelopment of the Hale`iwa Commercial Project is expected to improve traffic flows, reduce on-street parking, and reduce the pedestrian traffic across Kamehameha Highway, along the frontage of the site.

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX A

TRAFFIC COUNT DATA

Study Name: Kamehameha Hwy and Emerson Rd (Tuesday)
Start Date: 11/16/2010
Start Time: 2:00 PM

Traffic Survey

		Westbound East Leg		Northbound South Leg		Southbound North Leg		
From	To	Left	Right	Thru	Right	Left	Thru	Total
2:00 PM	2:15 PM	3	1	112	4	2	116	238
2:15 PM	2:30 PM	2	2	110	5	3	129	251
2:30 PM	2:45 PM	3	2	128	2	3	118	256
2:45 PM	3:00 PM	3	0	86	1	0	108	198
3:00 PM	3:15 PM	3	1	112	5	1	117	239
3:15 PM	3:30 PM	5	7	93	0	1	107	213
3:30 PM	3:45 PM	2	2	106	0	1	123	234
3:45 PM	4:00 PM	0	1	89	1	2	118	211
4:00 PM	4:15 PM	2	3	126	4	3	128	**266**
4:15 PM	4:30 PM	0	1	88	2	1	98	190
4:30 PM	4:45 PM	1	0	94	1	0	98	194
4:45 PM	5:00 PM	1	5	122	1	0	131	260
Weekday Peak Hour Traffic								
3:15 PM	**4:15 PM**	**9**	**13**	**414**	**5**	**7**	**476**	**924**
		1.13	**1.08**	**0.82**	**0.31**	**0.58**	**0.93**	**0.87**

Pedestrian Survey

From	To	East Leg Peds	South Leg Peds	North Leg Peds	Total
2:00 PM	2:15 PM	8	2	9	19
2:15 PM	2:30 PM	4	4	5	13
2:30 PM	2:45 PM	5	0	5	10
2:45 PM	3:00 PM	3	9	6	18
3:00 PM	3:15 PM	2	5	1	8
3:15 PM	3:30 PM	3	11	2	16
3:30 PM	3:45 PM	0	0	6	6
3:45 PM	4:00 PM	2	6	2	10
4:00 PM	4:15 PM	2	1	11	14
4:15 PM	4:30 PM	0	5	5	10
4:30 PM	4:45 PM	7	4	14	25
4:45 PM	5:00 PM	0	9	5	14
Weekday Peak Hour Pedestrian Traffic					
3:15 PM	**4:15 PM**	**7**	**18**	**21**	**46**

Study Name: Kamehameha Hwy and Emerson Rd (Sunday)
Start Date: 11/14/2010
Start Time: 1:30 PM

Traffic Survey

		Westbound East Leg		Northbound South Leg		Southbound North Leg		
From	To	Left	Right	Thru	Right	Left	Thru	Total
1:30 PM	1:45 PM	1	2	138	1	0	143	285
1:45 PM	2:00 PM	1	0	137	4	1	146	289
2:00 PM	2:15 PM	3	3	131	3	6	147	293
2:15 PM	2:30 PM	2	4	128	3	2	133	272
2:30 PM	2:45 PM	3	3	124	6	1	139	276
2:45 PM	3:00 PM	1	4	146	3	3	154	**311**
3:00 PM	3:15 PM	2	6	131	2	3	132	276
3:15 PM	3:30 PM	3	5	112	4	1	172	297
3:30 PM	3:45 PM	6	1	98	3	2	135	245
3:45 PM	4:00 PM	4	2	93	6	0	148	253
4:00 PM	4:15 PM	2	0	109	1	2	129	243
4:15 PM	4:30 PM	1	3	123	2	3	131	263
Sunday Peak Hour Traffic								
2:30 PM	**3:30 PM**	**9**	**18**	**513**	**15**	**8**	**597**	**1160**
		2.25	**1.13**	**0.88**	**1.25**	**0.67**	**0.97**	**0.93**

Pedestrian Survey

		East Leg	South Leg	North Leg	
From	To	Peds	Peds	Peds	Total
1:30 PM	1:45 PM	6	4	7	17
1:45 PM	2:00 PM	17	20	7	44
2:00 PM	2:15 PM	3	18	4	25
2:15 PM	2:30 PM	15	31	15	61
2:30 PM	2:45 PM	0	31	16	47
2:45 PM	3:00 PM	2	23	10	35
3:00 PM	3:15 PM	7	23	4	34
3:15 PM	3:30 PM	3	14	4	21
3:30 PM	3:45 PM	1	19	1	21
3:45 PM	4:00 PM	3	17	14	34
4:00 PM	4:15 PM	3	15	10	28
4:15 PM	4:30 PM	3	12	17	32
Sunday Peak Hour Pedestrian Traffic					
2:30 PM	**3:30 PM**	**12**	**91**	**34**	**137**

TRAFFIC COUNT DATA

FILE NAME: Kam Hwy Kewalo Ln

PROJECT: Haleiwa Commercial Redevelopment
LOCATION: Haleiwa, Hawaii
E-W STREET: Kewalo Lane
N-S STREET: Kamehameha Highway

PERIOD: Sunday Peak Hour
TECHNICIAN: Video
DATE: 11/14/10

		Kewalo Lane							Pedestrians			Tour Buses	
TIME		SBT	SBR	EBL	EBR	NBL	NBT	TOTAL	N Leg	W Leg	S Leg	EBT	WBT
14:15	14:30	131	5	1	5	3	134	279	2	10	0	0	0
14:30	14:45	152	6	3	2	3	131	297	0	34	0	0	0
14:45	15:00	149	10	2	7	1	135	304	0	23	0	0	0
15:00	15:15	138	1	1	3	1	126	270	4	33	0	1	0
15:15	15:30	167	13	3	1	1	107	292	4	23	0	0	0
SUNDAY PEAK HOUR													
14:30	**15:30**	**606**	**30**	**9**	**13**	**6**	**499**	**1163**	**8**	**79**	**0**	**1**	**0**
PHF		**1.02**	**0.75**	**1.13**	**0.46**	**1.50**	**0.92**	**0.96**					

TRAFFIC COUNT DATA

PROJECT: Haleiwa Commercial Redevelopment
LOCATION: Haleiwa, Hawaii
E-W STREET Kewalo Lane
N-S STREET Kamehameha Highway

PERIOD: PM Peak
TECHNICIAN: Video
DATE: 11/16/10

		Kewalo Lane							Pedestrians			Tour Buses	
TIME		SBT	SBR	EBL	EBR	NBL	NBT	TOTAL	N Leg	W Leg	S Leg	EBT	WBT
15:15	15:30	107	7	1	5	6	92	218	0	30	0	0	0
15:30	15:45	121	6	3	0	2	104	236	2	36	0	0	0
15:45	16:00	108	5	12	4	3	75	207	0	25	0	0	0
16:00	16:15	125	2	7	2	1	118	255	0	35	0	0	0
										1:33			
PM PEAK HOUR													
15:15	**16:15**	**461**	**20**	**23**	**11**	**12**	**389**	**916**	**2**	**126**	**0**	**0**	**0**
PHF		**0.95**	**0.83**	**1.92**	**N/A**	**1.50**	**0.94**	**0.97**					

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX B

CAPACITY ANALYSIS WORKSHEETS

EXISTING TRAFFIC CONDITIONS

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	13	414	5	7	476
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.82	0.31	0.58	0.93
Hourly flow rate (vph)	9	13	505	16	12	512
Pedestrians	7		18			21
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		2			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1074	541			528	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1074	541			528	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	235	527			1032	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	521	524
Volume Left	9	0	12
Volume Right	13	16	0
cSH	349	1700	1032
Volume to Capacity	0.06	0.31	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	16.0	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	16.0	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	1	426	482	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.93	0.82	0.82	0.93	0.93
Hourly flow rate (vph)	1	1	1	520	518	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1041	519	519			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1041	519	519			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	255	557	1047			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	521	519
Volume Left	1	1	0
Volume Right	1	0	1
cSH	341	1047	1700
Volume to Capacity	0.01	0.00	0.31
Queue Length 95th (ft)	1	0	0
Control Delay (s)	15.6	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	15.6	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	23	11	12	389	461	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	0.94	0.95	0.83
Hourly flow rate (vph)	23	11	12	414	485	24
Pedestrians	126					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1061	623	635			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1061	623	635			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	215	428	834			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	426	509
Volume Left	23	12	0
Volume Right	11	0	24
cSH	256	834	1700
Volume to Capacity	0.13	0.01	0.30
Queue Length 95th (ft)	11	1	0
Control Delay (s)	21.2	0.4	0.0
Lane LOS	C	A	
Approach Delay (s)	21.2	0.4	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	18	513	15	8	597
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.88	1.00	0.67	0.97
Hourly flow rate (vph)	9	18	583	15	12	615
Pedestrians	12		91			34
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		9			3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1333	636			610	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1333	636			610	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	96			99	
cM capacity (veh/h)	152	457			958	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	598	627
Volume Left	9	0	12
Volume Right	18	15	0
cSH	273	1700	958
Volume to Capacity	0.10	0.35	0.01
Queue Length 95th (ft)	8	0	1
Control Delay (s)	19.6	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	19.6	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	1	530	604	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.97	0.97
Hourly flow rate (vph)	1	1	1	602	623	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1228	623	624			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1228	623	624			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	197	486	957			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	603	624
Volume Left	1	1	0
Volume Right	1	0	1
cSH	280	957	1700
Volume to Capacity	0.01	0.00	0.37
Queue Length 95th (ft)	1	0	0
Control Delay (s)	18.0	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	18.0	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	13	6	499	606	30
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	0.46	1.00	0.92	1.00	0.75
Hourly flow rate (vph)	9	28	6	542	606	40
Pedestrians	79				8	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	8				1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1267	705	725			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1267	705	725			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	93	99			
cM capacity (veh/h)	170	404	812			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	37	548	646
Volume Left	9	6	0
Volume Right	28	0	40
cSH	303	812	1700
Volume to Capacity	0.12	0.01	0.38
Queue Length 95th (ft)	10	1	0
Control Delay (s)	18.6	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	18.6	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX C

CAPACITY ANALYSIS WORKSHEETS

PEAK HOUR TRAFFIC WITHOUT PROJECT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	13	422	5	7	486
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.82	0.31	0.58	0.93
Hourly flow rate (vph)	9	13	515	16	12	523
Pedestrians	7		18			21
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		2			2
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1094	551			538	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1094	551			538	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	228	520			1024	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	531	535
Volume Left	9	0	12
Volume Right	13	16	0
cSH	342	1700	1024
Volume to Capacity	0.06	0.31	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	16.3	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	16.3	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	1	435	492	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.93	0.82	0.82	0.93	0.93
Hourly flow rate (vph)	1	1	1	530	529	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1062	530	530			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1062	530	530			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	247	549	1037			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	532	530
Volume Left	1	1	0
Volume Right	1	0	1
cSH	333	1037	1700
Volume to Capacity	0.01	0.00	0.31
Queue Length 95th (ft)	1	0	0
Control Delay (s)	15.9	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	15.9	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	23	11	12	397	470	20
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	0.94	0.95	0.83
Hourly flow rate (vph)	23	11	12	422	495	24
Pedestrians	126					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1079	633	645			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1079	633	645			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	99			
cM capacity (veh/h)	210	422	827			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	34	434	519
Volume Left	23	12	0
Volume Right	11	0	24
cSH	250	827	1700
Volume to Capacity	0.14	0.01	0.31
Queue Length 95th (ft)	12	1	0
Control Delay (s)	21.6	0.4	0.0
Lane LOS	C	A	
Approach Delay (s)	21.6	0.4	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	40.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	18	523	15	8	609
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.88	1.00	0.67	0.97
Hourly flow rate (vph)	9	18	594	15	12	628
Pedestrians	12		91			34
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		9			3
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1357	648			621	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1357	648			621	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	96			99	
cM capacity (veh/h)	147	450			948	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	609	640
Volume Left	9	0	12
Volume Right	18	15	0
cSH	266	1700	948
Volume to Capacity	0.10	0.36	0.01
Queue Length 95th (ft)	8	0	1
Control Delay (s)	20.0	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	20.0	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	1	541	616	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.97	0.97
Hourly flow rate (vph)	1	1	1	615	635	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1253	636	636			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1253	636	636			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	190	478	947			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	2	616	636
Volume Left	1	1	0
Volume Right	1	0	1
cSH	272	947	1700
Volume to Capacity	0.01	0.00	0.37
Queue Length 95th (ft)	1	0	0
Control Delay (s)	18.4	0.0	0.0
Lane LOS	C	A	
Approach Delay (s)	18.4	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	9	13	6	509	618	31
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	0.46	1.00	0.92	1.00	0.75
Hourly flow rate (vph)	9	28	6	553	618	41
Pedestrians	79				8	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	8				1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1291	718	738			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1291	718	738			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	93	99			
cM capacity (veh/h)	164	397	802			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	37	559	659
Volume Left	9	6	0
Volume Right	28	0	41
cSH	296	802	1700
Volume to Capacity	0.13	0.01	0.39
Queue Length 95th (ft)	11	1	0
Control Delay (s)	18.9	0.2	0.0
Lane LOS	C	A	
Approach Delay (s)	18.9	0.2	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX D

CAPACITY ANALYSIS WORKSHEETS

PEAK HOUR TRAFFIC WITH PROJECT

NO IMPROVEMENTS

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	13	434	5	7	498
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.82	0.31	0.58	0.93
Hourly flow rate (vph)	9	13	529	16	12	535
Pedestrians	7		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1114	554			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1114	554			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	224	523			1011	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	545	548
Volume Left	9	0	12
Volume Right	13	16	0
cSH	338	1700	1011
Volume to Capacity	0.07	0.32	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	16.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	16.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	29	50	398	476	68
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.82	0.82	0.93	0.93
Hourly flow rate (vph)	80	32	61	485	512	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1156	548	585			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1156	548	585			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	61	94	94			
cM capacity (veh/h)	204	536	990			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	112	546	585
Volume Left	80	61	0
Volume Right	32	0	73
cSH	247	990	1700
Volume to Capacity	0.45	0.06	0.34
Queue Length 95th (ft)	55	5	0
Control Delay (s)	31.1	1.7	0.0
Lane LOS	D	A	
Approach Delay (s)	31.1	1.7	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	47	96	65	385	420	82
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	0.94	0.95	0.83
Hourly flow rate (vph)	47	96	65	410	442	99
Pedestrians	126					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1157	618	667			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1157	618	667			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	73	78	92			
cM capacity (veh/h)	176	431	812			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	143	475	541
Volume Left	47	65	0
Volume Right	96	0	99
cSH	292	812	1700
Volume to Capacity	0.49	0.08	0.32
Queue Length 95th (ft)	63	7	0
Control Delay (s)	28.7	2.2	0.0
Lane LOS	D	A	
Approach Delay (s)	28.7	2.2	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

Haleiwa Commercial Redevelopment
3: Emerson St & Kamehameha Hwy

HCM Unsignalized Intersection Capacity Analysis
Sunday Peak Hour Traffic With Project No Improvements

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	18	533	15	8	619
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.88	1.00	0.67	0.97
Hourly flow rate (vph)	9	18	606	15	12	638
Pedestrians	12		15			15
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1302	640			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1302	640			633	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	96			99	
cM capacity (veh/h)	171	463			939	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	621	650
Volume Left	9	0	12
Volume Right	18	15	0
cSH	295	1700	939
Volume to Capacity	0.09	0.37	0.01
Queue Length 95th (ft)	7	0	1
Control Delay (s)	18.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	18.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Haleiwa Commercial Redevelopment
4: Mahaulu Ln & Kamehameha Hwy

HCM Unsignalized Intersection Capacity Analysis
Sunday Peak Hour Traffic With Project No Improvements

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	76	29	45	507	598	71
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.97	0.97
Hourly flow rate (vph)	83	32	51	576	616	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1332	653	690			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332	653	690			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	49	93	94			
cM capacity (veh/h)	161	467	905			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	114	627	690
Volume Left	83	51	0
Volume Right	32	0	73
cSH	196	905	1700
Volume to Capacity	0.58	0.06	0.41
Queue Length 95th (ft)	80	4	0
Control Delay (s)	46.1	1.5	0.0
Lane LOS	E	A	
Approach Delay (s)	46.1	1.5	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	100	64	494	576	83
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	0.85	1.00	0.92	1.00	0.75
Hourly flow rate (vph)	34	118	64	537	576	111
Pedestrians	79				8	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	8				1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1383	710	766			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1383	710	766			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	75	71	92			
cM capacity (veh/h)	133	401	784			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	152	601	687
Volume Left	34	64	0
Volume Right	118	0	111
cSH	277	784	1700
Volume to Capacity	0.55	0.08	0.40
Queue Length 95th (ft)	76	7	0
Control Delay (s)	32.8	2.1	0.0
Lane LOS	D	A	
Approach Delay (s)	32.8	2.1	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	83.6%	ICU Level of Service	E
Analysis Period (min)	15		

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX E

CAPACITY ANALYSIS WORKSHEETS

PEAK HOUR TRAFFIC WITH PROJECT

SCHEME 1

Haleiwa Commercial Redevelopment — HCM Unsignalized Intersection Capacity Analysis

3: Emerson St & Kamehameha Hwy — Weekday PM Peak Hour With Project - Scheme 1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	13	434	5	7	498
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.82	0.31	0.58	0.93
Hourly flow rate (vph)	9	13	529	16	12	535
Pedestrians	7		10			10
Lane Width (ft)	12.0		12.0			11.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1114	554			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1114	554			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	224	524			1011	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	22	545	12	535
Volume Left	9	0	12	0
Volume Right	13	16	0	0
cSH	338	1700	1011	1700
Volume to Capacity	0.07	0.32	0.01	0.31
Queue Length 95th (ft)	5	0	1	0
Control Delay (s)	16.4	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	16.4	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

Haleiwa Commercial Redevelopment — HCM Unsignalized Intersection Capacity Analysis

4: Mahaulu Ln & Kamehameha Hwy — Weekday PM Peak Hour With Project - Scheme 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	29	50	398	476	68
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.82	0.82	0.93	0.93
Hourly flow rate (vph)	80	32	61	485	512	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1156	548	585			
vC1, stage 1 conf vol	548					
vC2, stage 2 conf vol	607					
vCu, unblocked vol	1156	548	585			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	94	94			
cM capacity (veh/h)	418	536	990			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	112	61	485	585
Volume Left	80	61	0	0
Volume Right	32	0	0	73
cSH	445	990	1700	1700
Volume to Capacity	0.25	0.06	0.29	0.34
Queue Length 95th (ft)	25	5	0	0
Control Delay (s)	15.8	8.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.8	1.0		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	47	96	65	385	420	82
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	0.94	0.95	0.83
Hourly flow rate (vph)	47	96	65	410	442	99
Pedestrians	126					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1157	618	667			
vC1, stage 1 conf vol	618					
vC2, stage 2 conf vol	540					
vCu, unblocked vol	1157	618	667			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	78	92			
cM capacity (veh/h)	383	431	812			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	143	65	410	541
Volume Left	47	65	0	0
Volume Right	96	0	0	99
cSH	414	812	1700	1700
Volume to Capacity	0.35	0.08	0.24	0.32
Queue Length 95th (ft)	38	7	0	0
Control Delay (s)	18.2	9.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.2	1.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	18	533	15	8	619
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.88	1.00	0.67	0.97
Hourly flow rate (vph)	9	18	606	15	12	638
Pedestrians	12		15			15
Lane Width (ft)	12.0		12.0			11.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1302	640			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1302	640			633	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	96			99	
cM capacity (veh/h)	171	464			939	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	27	621	12	638
Volume Left	9	0	12	0
Volume Right	18	15	0	0
cSH	295	1700	939	1700
Volume to Capacity	0.09	0.37	0.01	0.38
Queue Length 95th (ft)	7	0	1	0
Control Delay (s)	18.4	0.0	8.9	0.0
Lane LOS	C		A	
Approach Delay (s)	18.4	0.0	0.2	
Approach LOS	C			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	76	29	45	507	598	71
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.97	0.97
Hourly flow rate (vph)	83	32	51	576	616	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1332	653	690			
vC1, stage 1 conf vol	653					
vC2, stage 2 conf vol	678					
vCu, unblocked vol	1332	653	690			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	93	94			
cM capacity (veh/h)	374	467	905			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	114	51	576	690
Volume Left	83	51	0	0
Volume Right	32	0	0	73
cSH	396	905	1700	1700
Volume to Capacity	0.29	0.06	0.34	0.41
Queue Length 95th (ft)	29	4	0	0
Control Delay (s)	17.7	9.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.7	0.8		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		1.7	
Intersection Capacity Utilization		50.0%	ICU Level of Service A
Analysis Period (min)		15	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	100	64	494	576	83
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	0.85	1.00	0.92	1.00	0.75
Hourly flow rate (vph)	34	118	64	537	576	111
Pedestrians	79				8	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	8				1	
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1383	710	766			
vC1, stage 1 conf vol	710					
vC2, stage 2 conf vol	673					
vCu, unblocked vol	1383	710	766			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	71	92			
cM capacity (veh/h)	340	401	784			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	152	64	537	687
Volume Left	34	64	0	0
Volume Right	118	0	0	111
cSH	385	784	1700	1700
Volume to Capacity	0.39	0.08	0.32	0.40
Queue Length 95th (ft)	46	7	0	0
Control Delay (s)	20.3	10.0	0.0	0.0
Lane LOS	C	B		
Approach Delay (s)	20.3	1.1		0.0
Approach LOS	C			

Intersection Summary			
Average Delay		2.6	
Intersection Capacity Utilization		57.6%	ICU Level of Service B
Analysis Period (min)		15	

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX F

CAPACITY ANALYSIS WORKSHEETS

PEAK HOUR TRAFFIC WITH PROJECT

SCHEME 2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	13	434	5	7	498
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.82	0.31	0.58	0.93
Hourly flow rate (vph)	9	13	529	16	12	535
Pedestrians	7		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1114	554			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1114	554			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	224	523			1011	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	545	548
Volume Left	9	0	12
Volume Right	13	16	0
cSH	338	1700	1011
Volume to Capacity	0.07	0.32	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	16.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	16.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	29	50	398	476	68
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.82	0.82	0.93	0.93
Hourly flow rate (vph)	80	32	61	485	512	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1156	548	585			
vC1, stage 1 conf vol	548					
vC2, stage 2 conf vol	607					
vCu, unblocked vol	1156	548	585			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	81	94	94			
cM capacity (veh/h)	418	536	990			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	112	61	485	585
Volume Left	80	61	0	0
Volume Right	32	0	0	73
cSH	445	990	1700	1700
Volume to Capacity	0.25	0.06	0.29	0.34
Queue Length 95th (ft)	25	5	0	0
Control Delay (s)	15.8	8.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.8	1.0		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	47	96	65	385	420	82
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	0.94	0.95	0.83
Hourly flow rate (vph)	47	96	65	410	442	99
Pedestrians	126					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1157	618	667			
vC1, stage 1 conf vol	618					
vC2, stage 2 conf vol	540					
vCu, unblocked vol	1157	618	667			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	78	92			
cM capacity (veh/h)	383	431	812			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	143	65	410	541
Volume Left	47	65	0	0
Volume Right	96	0	0	99
cSH	414	812	1700	1700
Volume to Capacity	0.35	0.08	0.24	0.32
Queue Length 95th (ft)	38	7	0	0
Control Delay (s)	18.2	9.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.2	1.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	18	533	15	8	619
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.88	1.00	0.67	0.97
Hourly flow rate (vph)	9	18	606	15	12	638
Pedestrians	12		15			15
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1302	640			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1302	640			633	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	96			99	
cM capacity (veh/h)	171	463			939	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	621	650
Volume Left	9	0	12
Volume Right	18	15	0
cSH	295	1700	939
Volume to Capacity	0.09	0.37	0.01
Queue Length 95th (ft)	7	0	1
Control Delay (s)	18.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	18.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	76	29	45	507	598	71
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.97	0.97
Hourly flow rate (vph)	83	32	51	576	616	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1332	653	690			
vC1, stage 1 conf vol	653					
vC2, stage 2 conf vol	678					
vCu, unblocked vol	1332	653	690			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	78	93	94			
cM capacity (veh/h)	374	467	905			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	114	51	576	690
Volume Left	83	51	0	0
Volume Right	32	0	0	73
cSH	396	905	1700	1700
Volume to Capacity	0.29	0.06	0.34	0.41
Queue Length 95th (ft)	29	4	0	0
Control Delay (s)	17.7	9.2	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.7	0.8		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	100	64	494	576	83
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	0.85	1.00	0.92	1.00	0.75
Hourly flow rate (vph)	34	118	64	537	576	111
Pedestrians	79				8	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	8				1	
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1383	710	766			
vC1, stage 1 conf vol	710					
vC2, stage 2 conf vol	673					
vCu, unblocked vol	1383	710	766			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	71	92			
cM capacity (veh/h)	340	401	784			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	152	64	537	687
Volume Left	34	64	0	0
Volume Right	118	0	0	111
cSH	385	784	1700	1700
Volume to Capacity	0.39	0.08	0.32	0.40
Queue Length 95th (ft)	46	7	0	0
Control Delay (s)	20.3	10.0	0.0	0.0
Lane LOS	C	B		
Approach Delay (s)	20.3	1.1		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX G

CAPACITY ANALYSIS WORKSHEETS

PEAK HOUR TRAFFIC WITH PROJECT

SCHEME 3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	13	434	5	7	498
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.82	0.31	0.58	0.93
Hourly flow rate (vph)	9	13	529	16	12	535
Pedestrians	7		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1114	554			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1114	554			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	224	523			1011	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	545	548
Volume Left	9	0	12
Volume Right	13	16	0
cSH	338	1700	1011
Volume to Capacity	0.07	0.32	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	16.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	16.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	29	50	398	476	68
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.82	0.82	0.93	0.93
Hourly flow rate (vph)	80	32	61	485	512	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1156	548	585			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1156	548	585			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	61	94	94			
cM capacity (veh/h)	204	536	990			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	112	546	585
Volume Left	80	61	0
Volume Right	32	0	73
cSH	247	990	1700
Volume to Capacity	0.45	0.06	0.34
Queue Length 95th (ft)	55	5	0
Control Delay (s)	31.1	1.7	0.0
Lane LOS	D	A	
Approach Delay (s)	31.1	1.7	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	47	96	65	385	420	82
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	0.94	0.95	0.83
Hourly flow rate (vph)	47	96	65	410	442	99
Pedestrians	126					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	12					
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1157	618	667			
vC1, stage 1 conf vol	618					
vC2, stage 2 conf vol	540					
vCu, unblocked vol	1157	618	667			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	78	92			
cM capacity (veh/h)	383	431	812			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	143	65	410	541
Volume Left	47	65	0	0
Volume Right	96	0	0	99
cSH	414	812	1700	1700
Volume to Capacity	0.35	0.08	0.24	0.32
Queue Length 95th (ft)	38	7	0	0
Control Delay (s)	18.2	9.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	18.2	1.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	18	533	15	8	619
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.88	1.00	0.67	0.97
Hourly flow rate (vph)	9	18	606	15	12	638
Pedestrians	12		15			15
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1302	640			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1302	640			633	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	96			99	
cM capacity (veh/h)	171	463			939	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	621	650
Volume Left	9	0	12
Volume Right	18	15	0
cSH	295	1700	939
Volume to Capacity	0.09	0.37	0.01
Queue Length 95th (ft)	7	0	1
Control Delay (s)	18.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	18.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	76	29	45	507	598	71
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.97	0.97
Hourly flow rate (vph)	83	32	51	576	616	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1332	653	690			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332	653	690			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	49	93	94			
cM capacity (veh/h)	161	467	905			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	114	627	690
Volume Left	83	51	0
Volume Right	32	0	73
cSH	196	905	1700
Volume to Capacity	0.58	0.06	0.41
Queue Length 95th (ft)	80	4	0
Control Delay (s)	46.1	1.5	0.0
Lane LOS	E	A	
Approach Delay (s)	46.1	1.5	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	4.3		
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	100	64	494	576	83
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	0.85	1.00	0.92	1.00	0.75
Hourly flow rate (vph)	34	118	64	537	576	111
Pedestrians	79				8	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	8				1	
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1383	710	766			
vC1, stage 1 conf vol	710					
vC2, stage 2 conf vol	673					
vCu, unblocked vol	1383	710	766			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	71	92			
cM capacity (veh/h)	340	401	784			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	152	64	537	687
Volume Left	34	64	0	0
Volume Right	118	0	0	111
cSH	385	784	1700	1700
Volume to Capacity	0.39	0.08	0.32	0.40
Queue Length 95th (ft)	46	7	0	0
Control Delay (s)	20.3	10.0	0.0	0.0
Lane LOS	C	B		
Approach Delay (s)	20.3	1.1		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

TRAFFIC IMPACT ANALYSIS REPORT

FOR THE PROPOSED

HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT

HALE`IWA, HAWAII

APPENDIX H

CAPACITY ANALYSIS WORKSHEETS

PEAK HOUR TRAFFIC WITH PROJECT

SCHEME 4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	13	434	5	7	498
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.82	0.31	0.58	0.93
Hourly flow rate (vph)	9	13	529	16	12	535
Pedestrians	7		10			10
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1114	554			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1114	554			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	224	523			1011	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	22	545	548
Volume Left	9	0	12
Volume Right	13	16	0
cSH	338	1700	1011
Volume to Capacity	0.07	0.32	0.01
Queue Length 95th (ft)	5	0	1
Control Delay (s)	16.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	16.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	74	29	50	398	476	68
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.82	0.82	0.93	0.93
Hourly flow rate (vph)	80	32	61	485	512	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1156	548	585			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1156	548	585			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	61	94	94			
cM capacity (veh/h)	204	536	990			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	112	61	485	585
Volume Left	80	61	0	0
Volume Right	32	0	0	73
cSH	247	990	1700	1700
Volume to Capacity	0.45	0.06	0.29	0.34
Queue Length 95th (ft)	55	5	0	0
Control Delay (s)	31.1	8.9	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	31.1	1.0		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	47	96	65	385	420	82
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	1.00	1.00	0.94	0.95	0.83
Hourly flow rate (vph)	47	96	65	410	442	99
Pedestrians	126					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	12					
Right turn flare (veh)		4				
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1157	618	667			
vC1, stage 1 conf vol	618					
vC2, stage 2 conf vol	540					
vCu, unblocked vol	1157	618	667			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	78	92			
cM capacity (veh/h)	383	431	812			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	143	65	410	541
Volume Left	47	65	0	0
Volume Right	96	0	0	99
cSH	642	812	1700	1700
Volume to Capacity	0.22	0.08	0.24	0.32
Queue Length 95th (ft)	21	7	0	0
Control Delay (s)	15.7	9.8	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	15.7	1.3		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	45.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	9	18	533	15	8	619
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	1.00	1.00	0.88	1.00	0.67	0.97
Hourly flow rate (vph)	9	18	606	15	12	638
Pedestrians	12		15			15
Lane Width (ft)	12.0		12.0			12.0
Walking Speed (ft/s)	3.5		3.5			3.5
Percent Blockage	1		1			1
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1302	640			633	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1302	640			633	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	96			99	
cM capacity (veh/h)	171	463			939	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	27	621	650
Volume Left	9	0	12
Volume Right	18	15	0
cSH	295	1700	939
Volume to Capacity	0.09	0.37	0.01
Queue Length 95th (ft)	7	0	1
Control Delay (s)	18.4	0.0	0.3
Lane LOS	C		A
Approach Delay (s)	18.4	0.0	0.3
Approach LOS	C		

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	76	29	45	507	598	71
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.88	0.88	0.97	0.97
Hourly flow rate (vph)	83	32	51	576	616	73
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1332	653	690			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332	653	690			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	49	93	94			
cM capacity (veh/h)	161	467	905			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	114	51	576	690
Volume Left	83	51	0	0
Volume Right	32	0	0	73
cSH	196	905	1700	1700
Volume to Capacity	0.58	0.06	0.34	0.41
Queue Length 95th (ft)	80	4	0	0
Control Delay (s)	46.1	9.2	0.0	0.0
Lane LOS	E	A		
Approach Delay (s)	46.1	0.8		0.0
Approach LOS	E			

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	34	100	64	494	576	83
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	1.00	0.85	1.00	0.92	1.00	0.75
Hourly flow rate (vph)	34	118	64	537	576	111
Pedestrians	79				8	
Lane Width (ft)	12.0				12.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	8				1	
Right turn flare (veh)		4				
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1383	710	766			
vC1, stage 1 conf vol	710					
vC2, stage 2 conf vol	673					
vCu, unblocked vol	1383	710	766			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	71	92			
cM capacity (veh/h)	340	401	784			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	152	64	537	687
Volume Left	34	64	0	0
Volume Right	118	0	0	111
cSH	517	784	1700	1700
Volume to Capacity	0.29	0.08	0.32	0.40
Queue Length 95th (ft)	30	7	0	0
Control Delay (s)	17.5	10.0	0.0	0.0
Lane LOS	C	B		
Approach Delay (s)	17.5	1.1		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Appendix E
PRELIMINARY ENGINEERING REPORT

PRELIMINARY ENGINEERING REPORT

FOR

HALE‘IWA COMMERCIAL REDEVELOPMENT

HALE‘IWA, OAHU, HAWAII
TMK: (1) 6·6·004: 013 to 019, 27, 28 and 32

PREPARED BY:

LYON ASSOCIATES
45 N. King Street, Suite #501
Honolulu, Hawaii 96817

05/13/2011

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1.0 PROJECT DESCRIPTION

The proposed Hale‘iwa Commercial Redevelopment Project (the “Project”) is a planned commercial redevelopment including proposed construction of additional retail buildings, new parking and walkways and historic structure renovations. There are 10 parcels that make up the project site (TMK 6-6-004: 013 through 019, 27, 28, and 32) and they are entirely owned by Kamehameha Schools. Current tenants lease the properties for various businesses and include Matsumoto Shave Ice, Haleiwa Eats, Global Creations, Aoki Shave Ice, House of Restoration Church, Iwa Gallery and ITC Water Management. The project will require zone changes from R-5 to B-1 and AG-2 to Country. This site redevelopment is consistent with the policies and guidelines in the current and proposed North Shore Sustainable Communities Plan for Hale‘iwa Country Town District as required by the City and County of Honolulu. Although a zone change is proposed, many of these parcels are already utilized as neighborhood commercial.

2.0 EXISTING CONDITIONS

2.1 ROADWAYS AND TRAFFIC

Kamehameha Highway is a two-lane roadway within the City right-of-way (ROW) fronting majority of the project site and providing main access to the site. Other adjacent access to the Project includes private driveways on-site on both the north and south boundaries. There are easements in place to grant access to the lots behind. There are currently six access points along the project frontage which includes: an access from Kewalo Lane, a driveway between Aoki’s and House of Restoration Church, two entry points at Matsumoto’s parking lot, one access at ITC (between Global Creations/Haleiwa Eats,) and one access off of Mahaulu Lane. This area has been designated for road widening setbacks along Kamehameha Highway and will be discussed later in Section 3.1.

2.2 DRAINAGE FACILITIES

The project site has a relatively minimal slope running along Kamehameha Highway and behind the buildings there is a natural slope away from the highway. There are currently no existing drainage facilities and no defined natural drainage ways from Kamehameha Highway to the back of the site where an existing retention basin accommodates both on and off-site runoff. There are six (6) 12-inch clay drain pipes directing offsite flow from the southwest corner onto the property and an 18-inch PVC drain pipe under Mahaulu Lane guiding runoff from the northwest corner also onto the property. This runoff eventually finds its way to the retention basin. The existing runoff condition attributes about 64.83 cubic feet per second (cfs) flowing to the existing basin from on and off-site runoff. Full calculations can be seen in Appendix A: DRAINAGE RUNOFF CALCULATIONS. From the basin, there does not appear to be any outfall and the runoff ponds until the elevation exceeds 10.7 mean sea level (MSL). It then begins to backflow out the top side of the 18-inch PVC drain line. Mahaulu Lane drains to the northwest so it majority of the flow appears to end up in the upstream side of the 18-inch PVC line. Some surface flow from the site reaches Mahaulu

Lane closer to Kamehameha Highway and flows across to the neighboring lot to the north. With the limited topographic survey we have for the neighboring properties, it is uncertain how exactly the flow dissipates.

The entire site surface flows when it can, but there is a lot of ponding that takes place as is the case for much of Hale‘iwa. A site visit during heavy rain showed significant ponding along the edge of Kamehameha Highway and caused storm flooding issues for current lessees. This exposes a legitimate need for drainage improvements for the Project, specifically the lots along Kamehameha Highway. The property frontage along Kamehameha Highway has a natural slope of about 1.0% but varies between 0.2% and 2.25%. Majority of the lots fronting the street have an average slope less than 1.0% along their property lines.

In terms of flooding, the project is located in Zone X of the Federal Emergency Management Agency’s (FEMA) Flood Insurance Rate Map (FIRM). This indicates areas that are outside of FEMA’s designated 500-year flood zone. There is minimal to no threat of serious riverine or coastal flooding for the Project site.

2.3 EXISTING BWS INFRASTRUCTURE IN THE VICINITY OF THE PROJECT SITE

Based on the as-built drawings issued by the Board of Water Supply (BWS), there are two (2) active existing water lines located within Kamehameha Highway along the project frontage. There is an 8-inch line running in the lane adjacent to the property that serves parcels on both sides of Kamehameha Highway. There is also a 16-inch main running along the opposite side of the road from the Project with no service connections in the immediate vicinity. These drawings also showed abandoned 6-inch and 8-inch lines running under Kamehameha Highway.

Based on information verified with as-builts as well as telephone conversations with BWS, the parcels with water meter service are listed below in Table 2-1: Existing Water Meters.

Table 2-1: Existing Water Meters

TMK	Meter Size	Business/Customer
6-6-004: 015	5/8 inch	ITC Water Management Inc.
6-6-004: 016	5/8 inch	Matsumoto Store Inc.
6-6-004: 017	5/8 inch	Michael A. Aoki
6-6-004: 018	5/8 inch	House of Restoration Church

Although BWS has verified the information provided in Table 2-1, it could not fully be field verified. By walking the site and reviewing the topographic survey, there are seven water meters in or near the Kamehameha Project frontage. Three meters were identified as registered to property owners behind the Project (Ronald Ward, Min-Li Wang and Sophie

Balanay). The field team had trouble retrieving meter numbers from three of the seven meters, and it is confirmed that one of the meters is registered to Michael A. Aoki.

There are 3 fire hydrants within the immediate Project vicinity. There is an existing hydrant on the Project site at the end of Mahaulu Lane near the north end of the Project. The second hydrant is directly across Kamehameha Highway from Lot 15 (Matsumoto's Store) and the third is directly across Kamehameha Highway from Lot 9 (Aoki's Store). It appears that this layout was designed to comply with the BWS residential spacing standard of 350 feet as they are about 340 feet offset from each other.

2.4 WASTEWATER SYSTEMS

Currently, connection to the City's municipal wastewater system is not available. There is no plan to expand the system in the near future; therefore existing wastewater collection and disposal for these lots make use of septic tanks & leach fields (also known as treatment Individual Wastewater Systems) (IWS) and a cesspool. The plans obtained from the Hawaii State Department of Health (DOH) indicate that, on record, there are two (2) IWS systems as well as one (1) cesspool on-site. The topographic survey confirms the structural locations for these systems; however no verification could be made on connections to existing buildings. The septic tank systems are about 20 years old and the cesspool is about 30 years old. The existing cesspool should be cleaned, removed and backfilled regardless of whether the rezoning of these parcels is approved or not, however it is possible to convert the cesspool to a seepage pit if/when the Project moves forward.

The only verified wastewater systems on-site are as follows:

Lot 17 TMK 6-6-4:15 – Registered Cesspool. Verified through DOH as well as the topographic survey. Located on TMK 6-6-004:32 but serving Lot 17.

Lot 16 TMK 6-6-4:15 – Registered IWS. Verified through DOH as well as the topographic survey. Located on TMK 6-6-004:32 but serving Lot 16.

Lot 15 TMK 6-6-4:16 – Registered IWS. Verified through DOH as well as the topographic survey. Located on TMK 6-6-004:16 and serving Lot 15.

Lot 11 TMK 6-6-4:17 – Unregistered Sewer Box. Verified on topographic survey. Located on TMK 6-6-4:17 and appears to be serving Lot 11

It should also be noted that DOH has verified that nearly 100% of the Project site is outside of the State's designated No-Pass Zone. The No-Pass Zone indicates areas where only 1 IWS is allowed per lot of record. Since the property is in the Pass Zone, the Project could propose 1 IWS per 10,000 square feet of lot space; however, DOH limits IWS to 15,000 GPD per development and is not feasible for this Project.

3.0 PROPOSED CIVIL INFRASTRUCTURE

Construction is anticipated to begin in 2013 and be completed in 12-18 months depending on project phasing. An overall construction cost opinion has been broken down by section in Table 3-1: Construction Cost Opinion.

Table 3-1: Construction Cost Opinion

Development Item	Item Cost
Site Grading	$278,300
Demolition & Removal	$92,000
Driveway & Parking	$661,495
Storm Drainage System	$143,875
Sanitary Sewer System	$365,431
Water System	$62,500
Total Cost	$1,603,601

3.1 ROADWAYS AND TRAFFIC

The proposed parking layout which provides a 350% increase in on-site parking and the designated bus loading zone within the parking lot will help prevent traffic congestion along Kamehameha Highway. The parking lot will also provide a more organized and safer access to the site than the existing conditions, particularly the open lot adjacent to Matsumoto Shave Ice where there are no restrictions to where vehicles enter and exit the lot. The proposed designated pedestrian walkways and cross walks will help provide a much safer environment for pedestrians than the existing conditions.

The original ALTA Survey completed by Hawaii Land Consultants in 2009 indicated and meetings with City and County of Honolulu Department of Planning and Permitting (DPP), Traffic Review Branch (TRB) have confirmed that this span of Kamehameha Highway is subject to future road widening. Under the Revised Ordinances Section 14-21.1 & 14-21.2 (also known as Ordinance 2412) the City can require substantial improvements. If Ordinance 2412 were to be fully enforced, the entire span of Kamehameha Highway fronting the Project (about 630 feet) would have a 60 foot wide right-of-way (ROW). This would include a 34 feet roadway "curb-to-curb" and 13 feet of shoulder on both sides. The 34 feet of roadway would allow for two (2) 12 feet lanes in either direction with a 10 feet turn lane down the middle. The City roadway standard would also require sidewalk and curb & gutter improvements along the full 630 feet on the Project side of Kamehameha Highway. The current ROW for Kamehameha Highway fronting the Project varies from about 40 to 50 feet. Since this ideal case scenario would require widening on both sides of the street, this Project is not expected to dedicate all of the remaining 10 to 20 feet to make the ROW 60 feet. TRB has indicated different setback widths for each lot varying from 5 to 15 feet. Because some of the historic buildings will remain as is, the full widening and improvements discussed in Ordinance 2412 is not probable. This issue has been discussed with TRB and

it is understood that Ordinance 2412 will likely not be imposed for the full 630 feet of frontage.

Should the City impose any widening and setback requirements under Ordinance 2412, the utility poles fronting the Project would be relocated by HECo. and at no cost to the property owner. Other important implications of Ordinance 2412 are listed below:

- Ordinance 2412 requirements are normally imposed by the Civil Engineering Branch (CEB) on developments along City streets that the City has designated for setback improvements. However, this Project requires rezoning, therefore, the TRB has the authority to recommend street widening and improvements as a condition for zoning approval.

- Typically, the City evaluates implementation of Ordinance 2412 on a case-by-case basis. If there is strong need for the infrastructure, the City might be more inclined to enforce the Ordinance. For large developments, offsite infrastructure improvement needs may drive enforcement. Although the City could determine a need for these improvements on this Project, they must also consider maintaining the “small town” characteristics of Hale‘iwa through policies in the North Shore SCP, Land Use Ordinance (LUO), and the Hale‘iwa Special District.

It is also important to note the following in regards to setback impacts to existing and proposed structures:

- Existing structures within the street widening setback can remain within the street widening setback. New structures will be required to comply with the new street widening setback as well as the new building setback.

- If an existing building that encroaches within the street widening setback is improved, the existing building can remain within the street widening setback, as long as the proposed improvements are outside of the new street widening setback and new building setback. Based in discussions with TRB, for improvements within these setbacks, a discretionary decision would be made by DPP on whether they would be allowed or not, however, it is likely that cosmetic/restoration/repair work would be allowed.

Future traffic conditions were evaluated in the Traffic Impact Analysis Report (TMC, April 2011)The TIAR traffic mitigation recommendation to optimize future traffic flow is for the installation of a left-turn lanes on Kamehameha Highway at the intersection with private roads serving the project at Kewalo Lane and Mahaulu Lane. This may or may not be possible depending upon several factors primarily dealing with the narrow right-of-way in Haleiwa town, very little setback for older buildings along the roadway, and the community’s desire to retain the historic character of Haleiwa town, as reflected in the North Shore sustainable Communities Plan. . DPP-TRB and DTS have been consulted in the planning discussions for the possibility of installing a left-turn lane. The options for traffic mitigation involve multiple complications in terms of highway setbacks for existing and new buildings,

threats to pedestrian safety, effects on historic buildings, and the possible need for off-site private property condemnation.

The zone change for the commercial redevelopment is anticipated to require the project to comply with Ordinance 2412. Roadway improvements associated with the left-turn lane will have significant widening requirements. Due to the development of new commercial buildings at the southern end of the project area, the property setbacks and roadway widening to install a left-turn lane can be accommodated. The Kewalo Lane intersection also serves the adjoining Haleiwa Town Center, which is expected to have growing traffic volumes in the future. The new commercial frontage in this section of the project area will provide setback from the highway in compliance with the Ordinance.

The commercial redevelopment of the Matsumoto Shave Ice buildings and three other historic building in the northern portion of the project area will not allow for the Ordinance 2012 setbacks to be imposed. Several historic buildings would require demolition to satisfy the setback requirement.

The recommended traffic mitigation for installation of a left turn lane into Mahaulu Lane would encounter significant problems with pedestrian safety and partial demolition of historic buildings. The ideal ROW widening to accommodate the left-turn lane is not possible at the northern portion of the site due to widening encroachment on the existing historic buildings at Haleiwa Eats and Miura Store. The widening would also require land acquisition from the neighboring properties, one of which includes an historic structure.

Four preliminary schemes are under consideration for highway widening to provide traffic mitigation, as summarized below. In these scenarios, efforts have been made to accommodate the requested improvements by DPP-TRB and DTS, along with Ordinance 2412 setbacks. The scenarios are being evaluated for their potential traffic flow benefits balanced with their anticipated impacts (pedestrian safety, historic building integrity, private property condemnation). Table 3-2 below presents the range of issues associated with each scenario.

Scheme 1 – Standard Dimensions (Figure 3-1)

- Scheme 1 has been developed based on meetings and discussions with TRB. These improvements include 10' wide left turn storage lanes and median shelter lanes at Kewalo Lane and Mahaulu Lane, 12' wide through lanes in each direction, and 13' wide shoulders. The widening is shown along the entire frontage of the Project and can also provide for a left turn at Emerson Street. Scheme 1 is TRB's ideal case scenario, but it is the least feasible scheme because of its extensive impacts to the existing historic buildings and the neighboring properties.

Scheme 2 – Narrower/Shorter Medial Lane at Mahaulu Lane and Reduced Shoulder Lane Dimensions (Figure 3-2)

- This scheme modifies the improvements at Mahaulu Lane to minimize the impacts to existing structures that are expected to remain after the development of the Project.

The shoulders fronting existing buildings that will remain were reduced from 13' to 8'. The left-turn storage lane at Mahaulu was reduced from 80' to 50'. The median shelter lane was also reduced from 80' to 40'. In order to avoid impacting an existing building to the north of the project site, the southbound through lane of Kamehameha Highway was reduced from 12' to 11'. The pavement taper was reduced from 180' (30 mph design speed) to 115' (25 mph posted speed). Finally Kamehameha Highway is widened only within the limits of the Kewalo and Mahaulu Lane intersections, i.e., the improved three-lane roadway section returns to the existing two-lane section, fronting the project site. This scheme results in impacts to the existing historic buildings on KS and neighboring properties, although the impacts are less extensive than Scheme 1. The existing historic buildings' lanais would become part of the widened roadway shoulders which poses pedestrian safety concerns to the property owner.

Scheme 3 – Preferred Scheme: Medial Lane Improvement at Kewalo Lane (Figure 3-3)

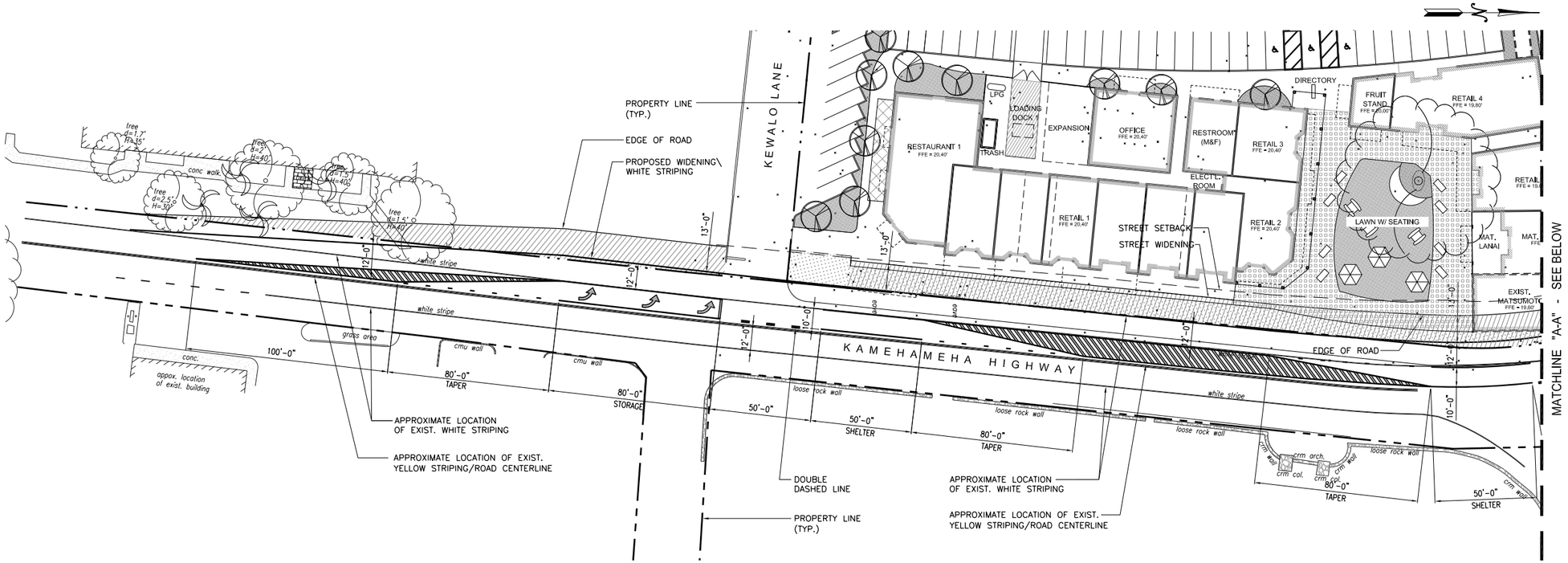
- Scheme 3 represents traffic improvements only at the Kewalo Lane intersection with no improvements to Kamehameha Highway at the Mahaulu Lane intersection. Kewalo Lane is widened to provide separate left turn and right turn lanes to accommodate the potential increase in traffic demand. The left turn lane length on Kamehameha Highway at Kewalo Lane has extended from 80' to 100'. With this scheme, one left turn opportunity is provided to accommodate majority of the left turn flow into the redeveloped project area. This preserves the safety of pedestrians, as well as retaining the integrity of historic buildings. Scheme 3 avoids a requirement for land acquisition at neighboring properties north of the Project, impacts to a historic building, and potential effects to pedestrian safety along this property frontage.

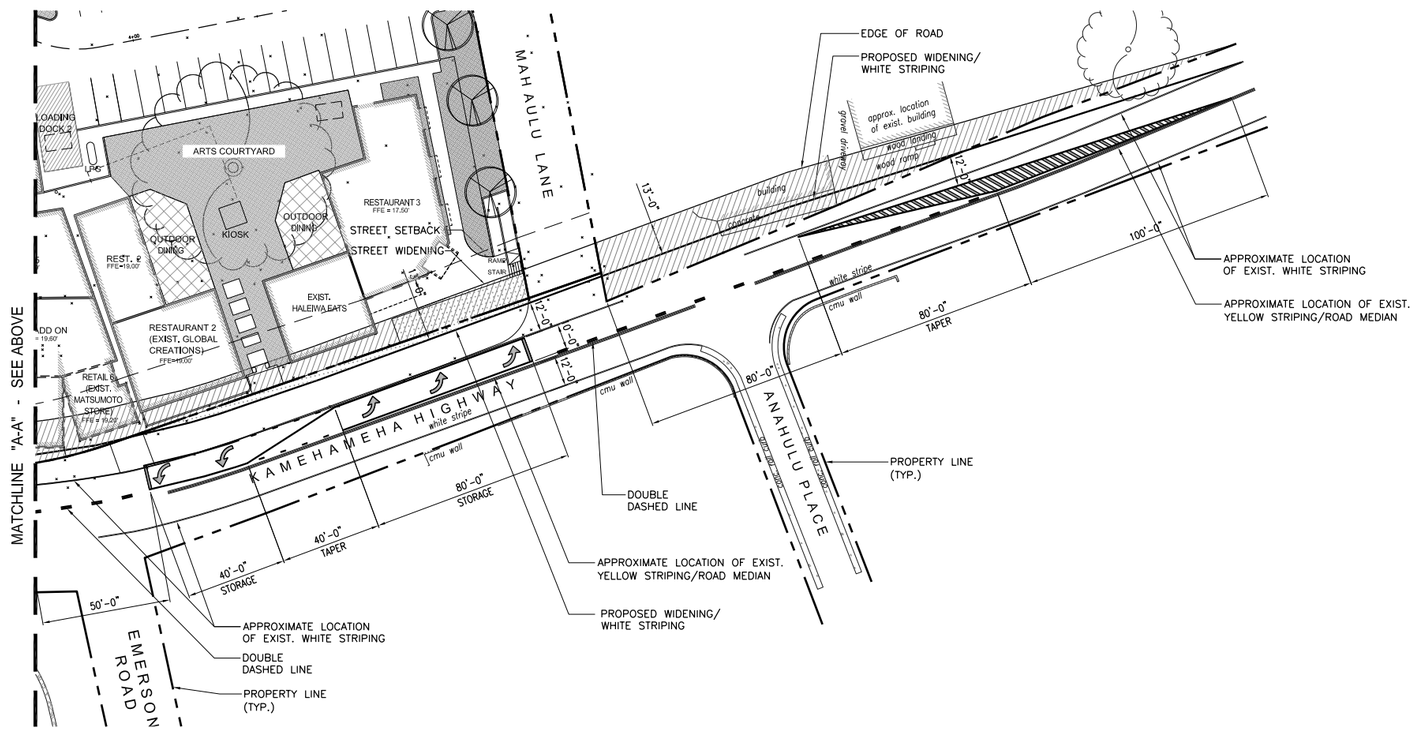
Scheme 4 – Re-evaluation of Scheme 2: Elimination of Mahaulu Lane shelter lane (Figure3-4)

- This final scheme re-evaluates Scheme 2 to remove the shelter lane north of Mahaulu. The southbound lane, however, has been brought back up to standard from 11' wide to 12' but the pavement taper is still based on the 25 mph posted speed. This scheme reduces the proposed widening and encroachment on the historic building to the north, however still overlaps the building's lanai.

Table 3-2: Access/Egress Options for the Haleiwa Commercial Redevelopment

	Scheme 1 Ord. 2412	Scheme 2 Reduced Median Lane Width and Length at Mahaulu Lane	Scheme 3 Left-turn Lane at Kewalo Lane Only and Separate Left-turn/Right-turn Out from Kewalc	Scheme 4 Scheme 3+Scheme 2 Without Median Lane North of Mahaulu
Lane Widths				
Travel Lanes	12 ft	12 ft	12 ft	12 ft
Left-turn Lane	10 ft	10 ft	10 ft (Kewalo only)	10 ft
Median Shelter Lane	10 ft	10 ft (Kewalo) 9 ft (Mahaulu)	10 ft (Kewalo only)	10 ft (Kewalo only)
Shoulder	13 ft	13 ft (Kewalo) 8 ft (Mahaulu)	13 ft (Kewalo only)	13 ft (Kewalo) 8 ft (Mahaulu)
Smallest Pedestrian Buffer	~2 ft	~5 ft	~13 ft	~3 ft
Left-turn Lane Lengths				
Kewalo	80 ft	80 ft	100 ft	100 ft
Car Storage	4 cars	4 cars	5 cars	5 cars
Mahaulu	80 ft	50 ft	-	50 ft
Car Storage	4 cars	2 cars	-	2 cars
Emerson	40 ft	-	-	-
Car Storage	2 cars	-	-	-
Median Shelter Lane Lengths				
Kewalo	50 ft	50 ft	50 ft	50 ft
Mahaulu	80 ft	40 ft	-	-
Improve LOS				
Kewalo	Yes	Yes	Yes	Yes
Mahaulu	Yes	Yes	No	No but reduce delay to northbound through traffic
Acquisition Requirements	Haleiwa Town Center frontage (~270')	Haleiwa Town Center frontage (~240')	Haleiwa Town Center frontage (~285')	Haleiwa Town Center frontage (~285')
	Properites North of Mahaulu Lane Frontage (~260')	Properites North of Mahaulu Lane Frontage (~150')	-	Properites North of Mahaulu Lane Frontage (~130')
Number of Impacted Historic Buildings	6	2 (North Yoshida Store's lanai and H. Miura Store's Building)	0	2 (North Yoshida Store's lanai and H. Miura Store's lanai)
Implications	Forces pedestrian ROW onto all of the historic buildings	Forces pedestrian ROW onto the historic building or lanai, requires relocation of H. Miura Store building	Limits pedestrian walkway hazard	Forces pedestrian ROW onto the historic building's lanai, possible impact on H.Miura Store's awning
	Pedestrian walkway hazard	Pedestrian walkway hazard	Preserve integrity of the historic buildings	Pedestrian walkway hazard
	Little buffer between pedestrians and vehicles along historic buildings	Little buffer between pedestrians and vehicles along historic buildings	Allow for rural streetscape design that are consistent with the rural character	Little buffer between pedestrians and vehicles along historic buildings
	Require raised curb to separate pedestrain from traffic	Require raised curb to separate pedestrain from traffic		Require raised curb to separate pedestrain from traffic





1 - PRELIMINARY ROAD MARKING PLAN (SCHEME 1)

SCALE: 1"=30'

GRAPHICAL SCALE

30' 0 30' 60' 90'

SCALE: 1"=30'

GROUP 70 INTERNATIONAL

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Environmental Services

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Supervision and Observation of this project is as defined in Section 1.2 of the Hawaii Administrative Rules, Title 16, Chapter 115, Professional Engineers, Architects, Land Surveyors, and Landscape Architects.

04/30/12
Expiration Date of the License

REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

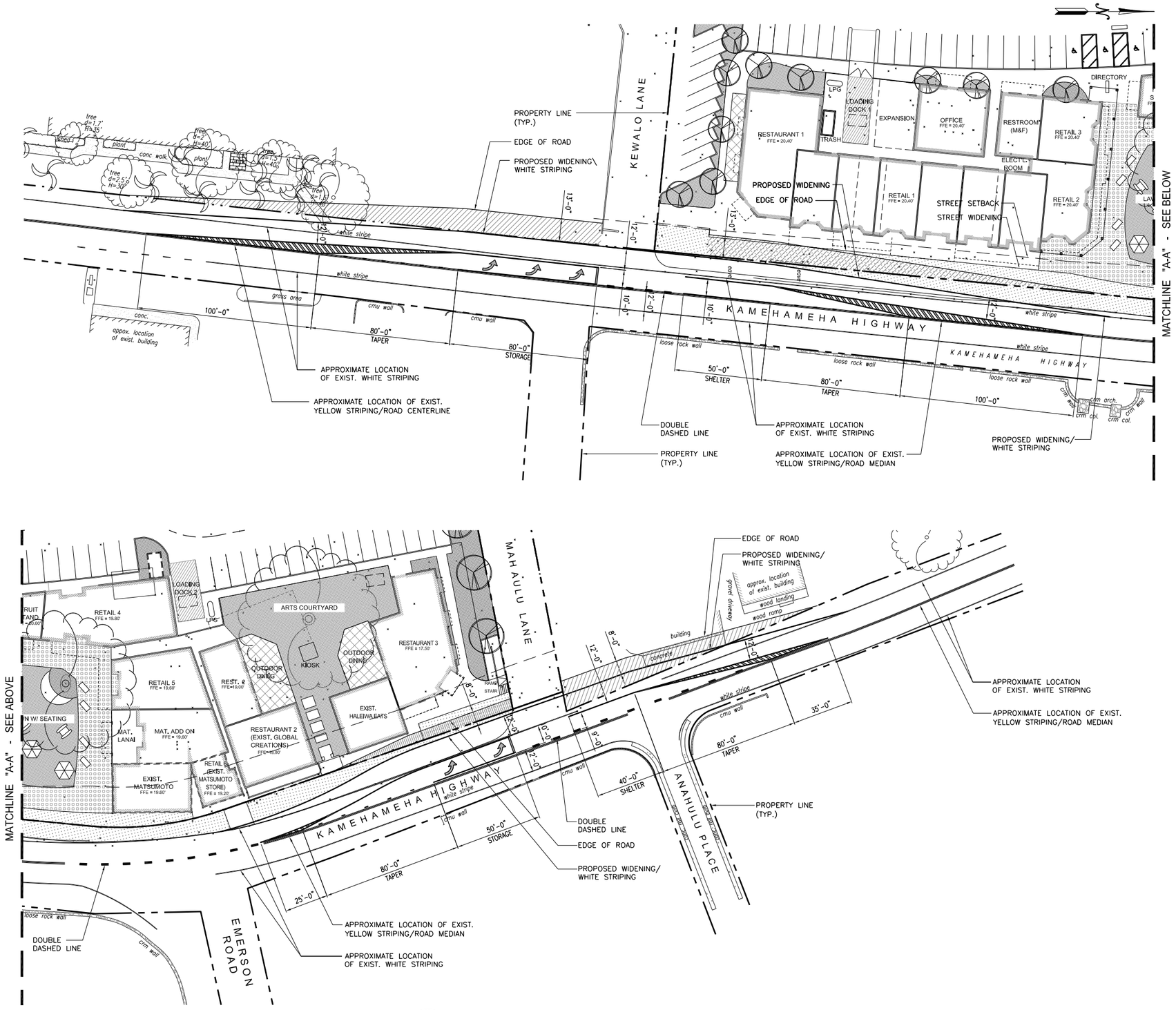
PRELIMINARY
ROAD MARKING PLAN (SCHEME 1)

SCALE:

DRAWN BY: | CHECKED BY:

PROJECT NO. | DRAWING NO.

DATE: | **FIGURE 3-1**



1 / - PRELIMINARY ROAD MARKING PLAN (SCHEME 2)
SCALE: 1"=30'

GRAPHICAL SCALE
30' 0 30' 60' 90'
SCALE: 1"=30'

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04/30/12
Expiration Date of the License

REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

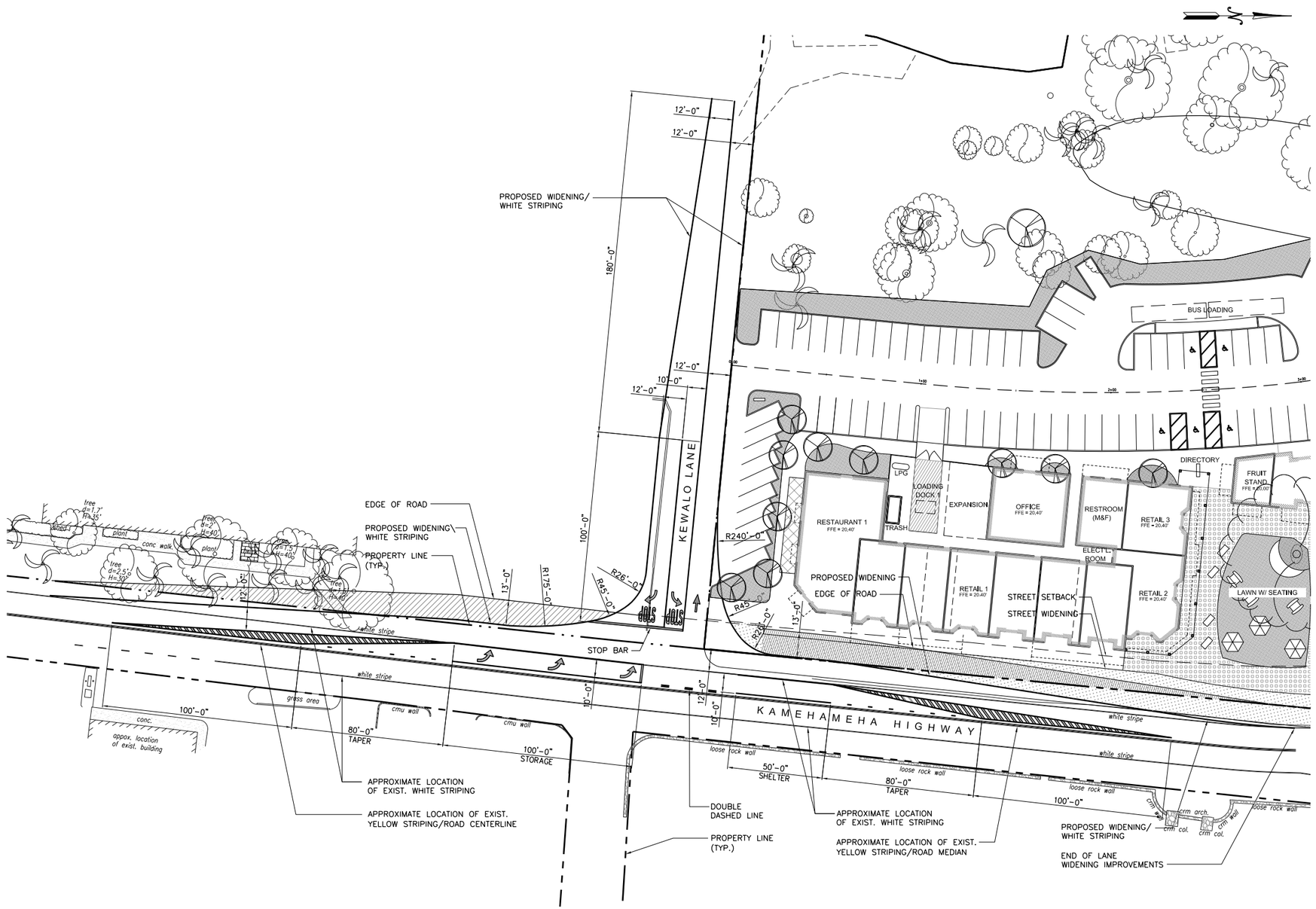
PRELIMINARY
ROAD MARKING PLAN (SCHEME 2)

SCALE:

DRAWN BY: | CHECKED BY:

PROJECT NO. | DRAWING NO.

DATE: | **FIGURE 3-2**



1 / - PRELIMINARY ROAD MARKING PLAN (SCHEME 3)
SCALE: 1"=30'

GRAPHICAL SCALE
30' 0 30' 60' 90'
SCALE: 1"=30'

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Environmental Services

Group 70 International, Inc.
925 Bethel Street, Fifth Floor
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04/30/12
Expiration Date of the License

REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

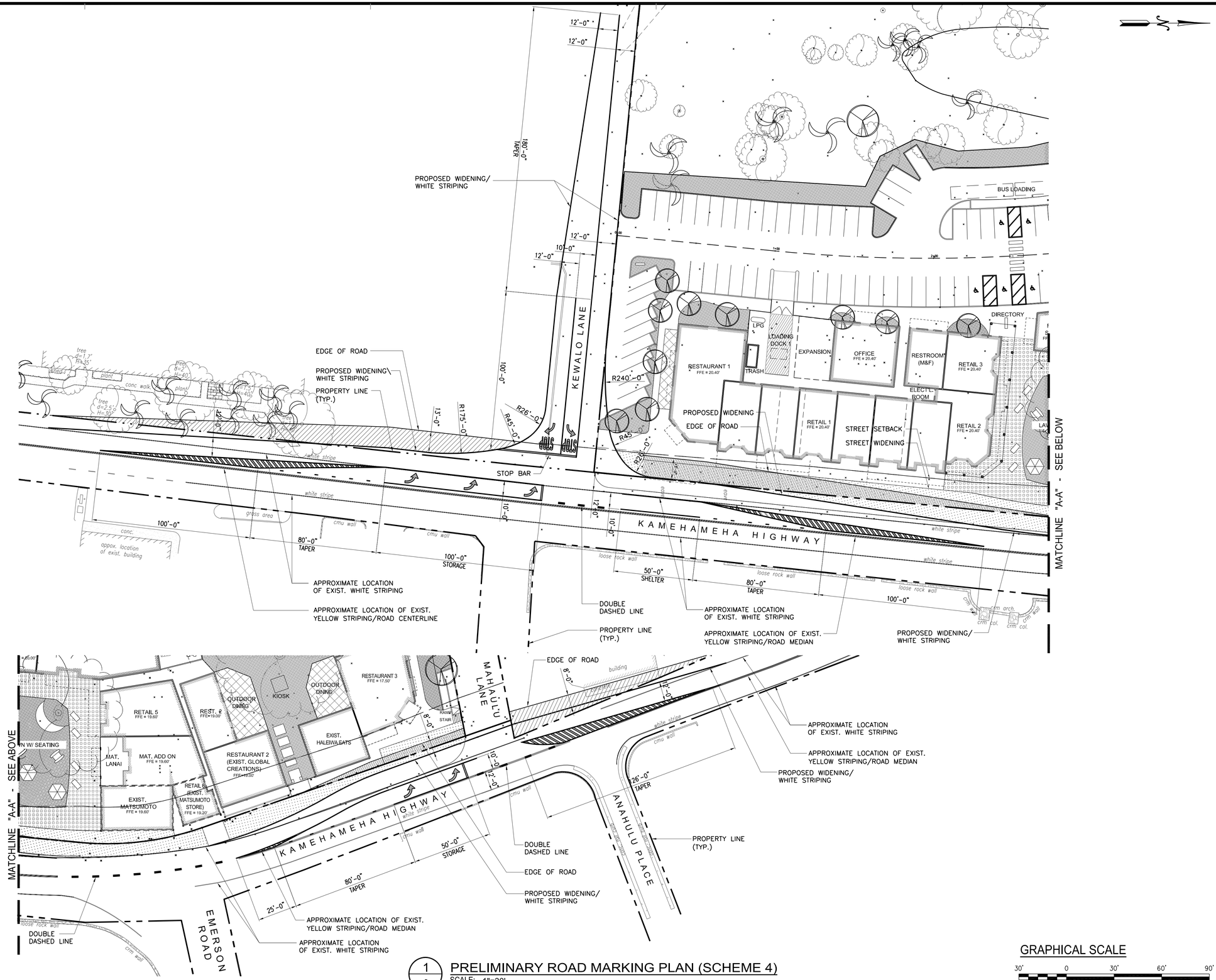
PRELIMINARY
ROAD MARKING PLAN (SCHEME 3)

SCALE:

DRAWN BY: | CHECKED BY:

PROJECT NO. | DRAWING NO.

DATE: | **FIGURE 3-3**



1 PRELIMINARY ROAD MARKING PLAN (SCHEME 4)
SCALE: 1"=30'

GRAPHICAL SCALE
30' 0 30' 60' 90'
SCALE: 1"=30'

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04/30/12
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REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

PRELIMINARY
ROAD MARKING PLAN (SCHEME 4)

SCALE:

DRAWN BY: CHECKED BY:

PROJECT NO. DRAWING NO.

DATE:

FIGURE 3-4

3.2 SITE GRADING AND EROSION CONTROL

Major grading will be minimized for the Project. The existing topography would be altered only to the extent necessary for construction of the proposed improvements. It is anticipated that grading would occur in attempt to balance the cut and fill quantities as best as possible to reduce overall construction costs. Grading permits, approved by the Hawaii State Department of Land and Natural Resources Historic Preservation Division and DPP would be required for all grading activities.

During all phases of construction, erosion control practices would comply with State, County and Federal regulations. National Pollutant Discharge Elimination System (NPDES) general permit coverage authorizing discharges of storm water associated with construction activities would be required for the project from the State Department of Health, Environmental Management Division, Clean Water Branch. Best management practices to control erosion during construction would be a component of the NPDES permit.

3.3 DRAINAGE FACILITIES

Storm water runoff from the site would be collected through area drains, ditches, and gutters, and transported through pipes toward the retention basin on the agricultural lots behind the street fronting parcels. Although there is an existing basin, the proposed size is based on the Rules Relating to Storm Drainage Standards January 2000, Department of Planning and Permitting, City and County of Honolulu and accommodates the increase in flow from this development. The minimum required size for the basin would be about 631.5 cubic yards. Based on the latest site plan, the proposed size of the retention basin is over 16,000 square feet and estimated to be about 2.5 feet deep. This would account for some of the additional off-site runoff, but not all. Runoff calculations can be seen in Appendix A: DRAINAGE RUNOFF CALCULATIONS.

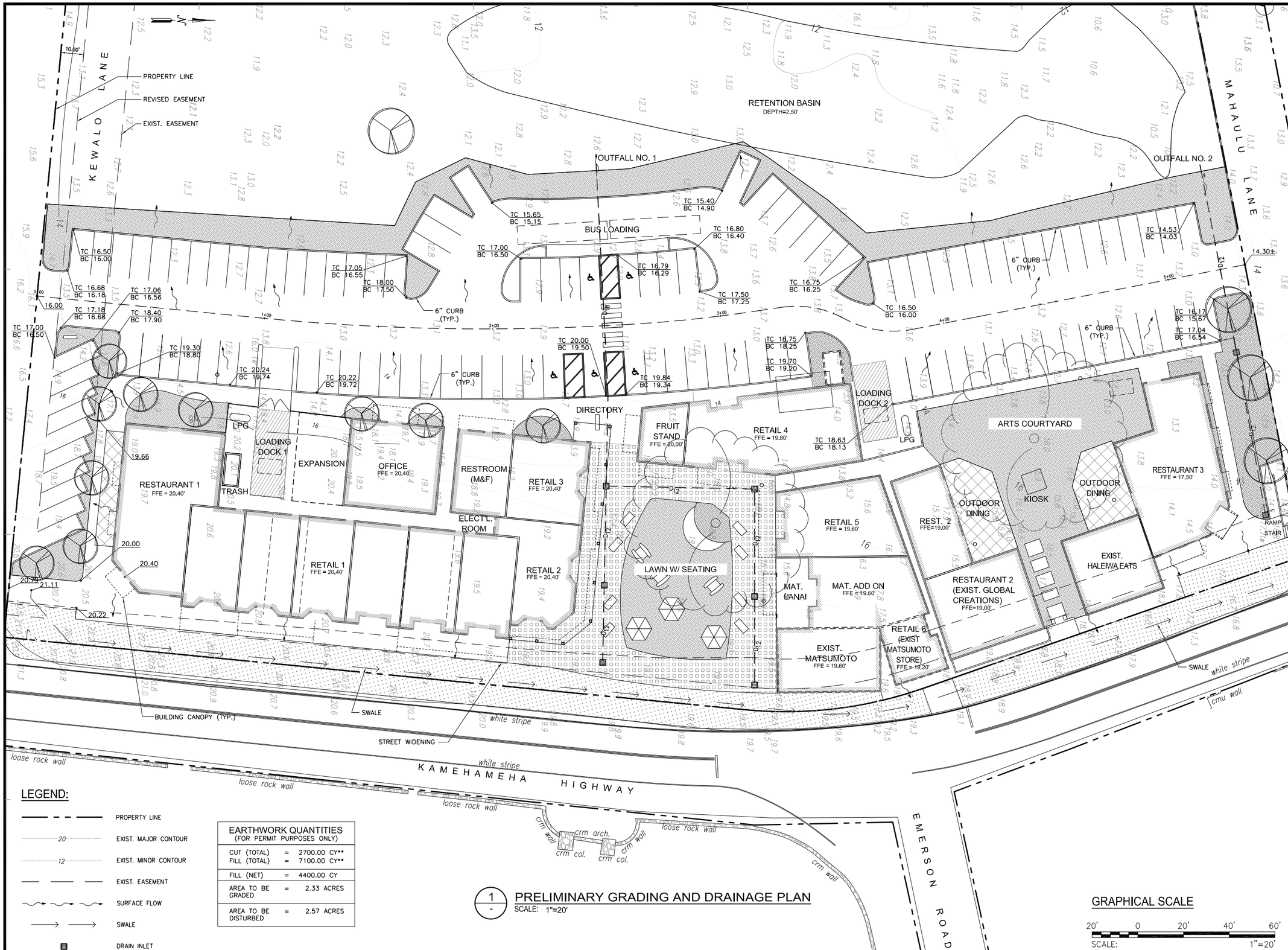
It is recommended that the retention volume be increased to hold as much of the excess off-site runoff as possible. As mentioned in Section 2.2, there is no outfall for the drainage therefore further offsite drainage analysis is being completed to accurately assess the conditions of the natural drainage pattern.

The runoff from Kamehameha Highway is proposed to remain within the City ROW and continue to flow south. With the possibility of widening the ROW, there should be plenty of space for a swale to divert the runoff. Walkways adjacent the buildings will also slope toward this swale but the post-development flow quantity exiting the Project site will not exceed the pre-development quantity. Runoff from the roofs will be directed to the back of the buildings and diverted to the retention basin away from Kamehameha Highway. This will help reduce the amount of site runoff flowing to the ROW.

Best management practices should be used in the design of the final drainage system, such as vegetated swales where possible, bioretention areas, and storm drain filtration devices to capture sediments. Low Impact Design elements like making use of the retention basin as a

bioretention area, and grass paver options in the proposed parking area should be strongly considered.

A Preliminary Grading/Drainage Plan has been prepared as Figure 3-5 on the next page.



LEGEND:

- PROPERTY LINE
- 20 — EXIST. MAJOR CONTOUR
- 12 — EXIST. MINOR CONTOUR
- EXIST. EASEMENT
- SURFACE FLOW
- SWALE
- DRAIN INLET

EARTHWORK QUANTITIES (FOR PERMIT PURPOSES ONLY)		
CUT (TOTAL)	=	2700.00 CY**
FILL (TOTAL)	=	7100.00 CY**
FILL (NET)	=	4400.00 CY
AREA TO BE GRADED	=	2.33 ACRES
AREA TO BE DISTURBED	=	2.57 ACRES

1 / - PRELIMINARY GRADING AND DRAINAGE PLAN
SCALE: 1"=20'

GRAPHICAL SCALE
20' 0 20' 40' 60'
SCALE: 1"=20'

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04/30/12
Expiration Date of the License

REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

PRELIMINARY
GRADING AND DRAINAGE PLAN

SCALE:

DRAWN BY: | CHECKED BY:

PROJECT NO. | DRAWING NO.

DATE: | **FIGURE 3-5**

3.4 WATER SYSTEM

As previously discussed, there are currently four (4) domestic water meters being utilized for these properties. Obviously the increase in structures would increase the need for water. An additional four (4) domestic meters are proposed to allow one per building and creates a total of eight (8). There is an additional meter being proposed for irrigation on the south end of the property. These meters would connect to the existing 8-inch line on the Project side of Kamehameha Highway.

With the Project applying for rezoning, the fire hydrant spacing requirements would become more stringent. With residential zoning, the spacing is currently 350 feet. The changeover to neighborhood business would reduce it to 250 feet. This would require installation of two (2) additional hydrants or one additional hydrant and relocating one of the existing hydrants discussed above.

In terms of water availability, a phone conversation with BWS has confirmed that new developments in this area will be limited to 25,000 GPD.

The Board of Water Supply's Water System Standards 2002, Table 100-18 Domestic Consumption Guidelines indicates average daily demand consumption of 3,000 gallons per acre for commercial developments, and 2,500 gallons per acre for country. The breakdown of water for full development of the proposed zoning can be seen in the Table 3-3 below.

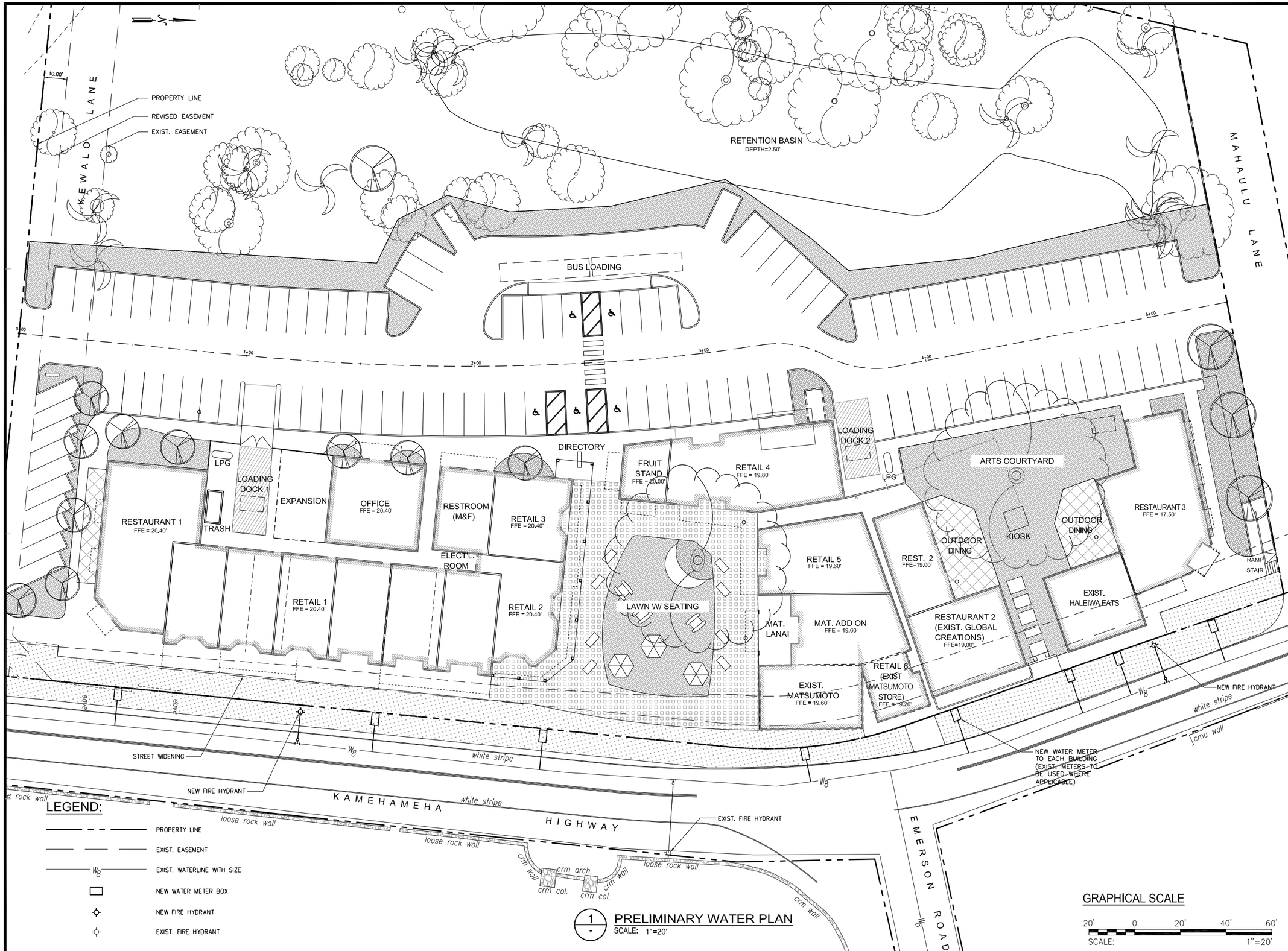
Table 3-3: City & County of Honolulu Water Demands by Zoning

Zoning	Acres	Daily Demand (gallons/acre)	Average Demand (Gallons)	Maximum Daily Demand (Gallons)
Commercial	1.88	3,000	5,640	8,460
Country	2.34	2,500	5,850	8,775
Total	4.22		11,490	17,235

The current layout of the proposed development limits the Maximum Daily Demand below what will be allotted for new developments in this area. Because the site will not be fully developed, there is no concern for water availability.

A submittal was made to BWS Project Review Section in December 2010 to verify water availability and a letter was received dated January 4, 2011 confirming that the system could accommodate the changes that the Project entails. The letter is attached for reference in Appendix B.

A Preliminary Water Plan has been prepared as Figure 3-6 on the next page.



1 PRELIMINARY WATER PLAN
SCALE: 1"=20'

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04/30/12
Expiration Date of the License

REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

PRELIMINARY WATER PLAN

SCALE:

DRAWN BY: CHECKED BY:

PROJECT NO. DRAWING NO.

DATE:

FIGURE 3-6

3.5 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

If IWSs are to be used for the redevelopment, the existing systems would need to be demolished and new ones designed and installed. This option was explored; however, the proposed flow quantity exceeds what DOH would currently allow. IWS usage and design is described in Chapter 62 of Title 11, Hawaii Administrative Rules, entitled "Wastewater Systems". These rules limit the amount of wastewater flow from a single development to 15,000 Gallons per day (GPD). The current projected wastewater flow for this development is about 40,000 GPD. The flow breakdown can be seen in Appendix C: WASTEWATER FLOW CALCULATIONS. The current proposed wastewater collection, treatment, and disposal is the use of an onsite treatment system. We have received cost estimates for the systems and construction costs and they are included in our overall engineers cost opinion.

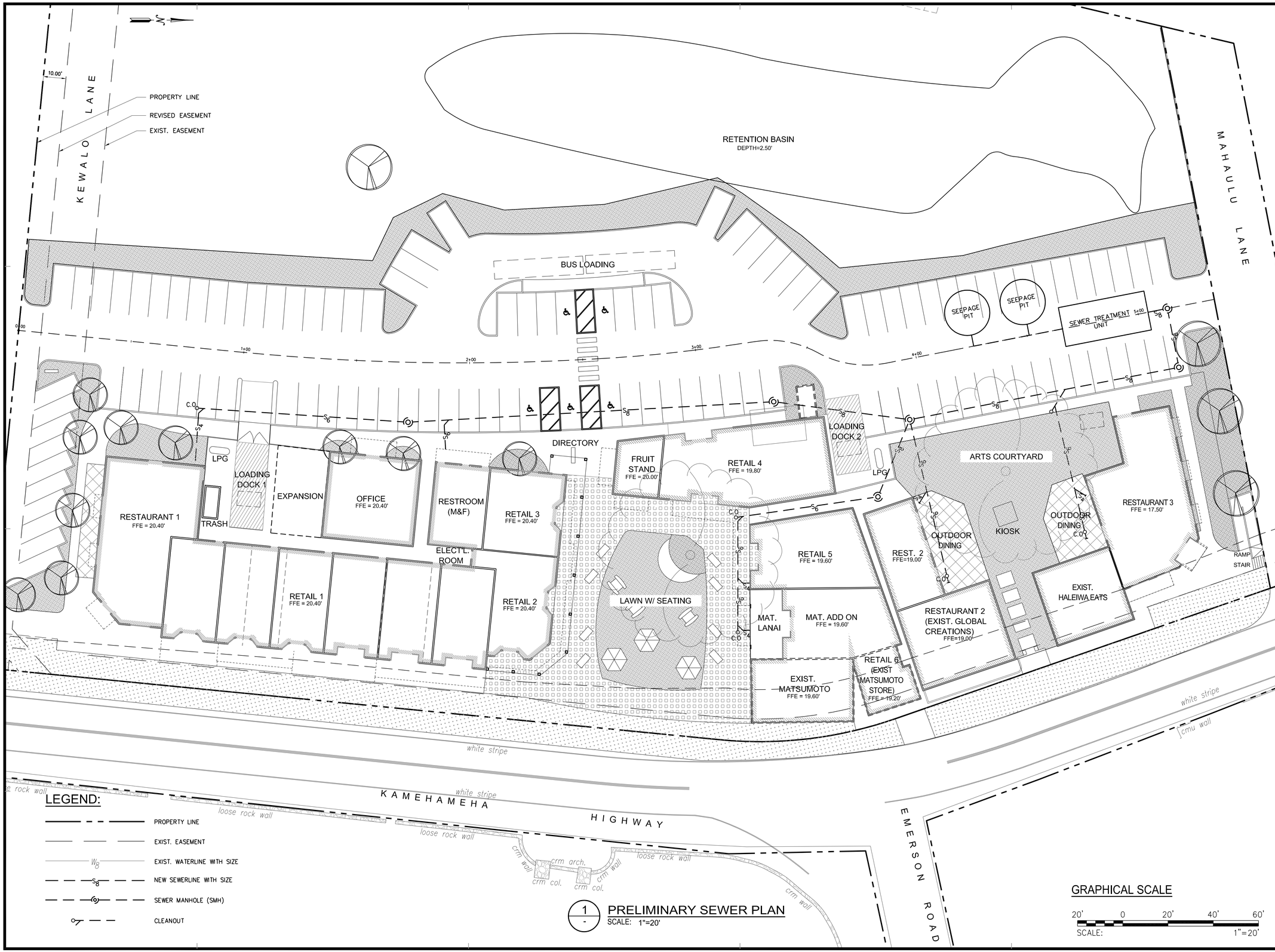
The proposed wastewater system design consolidates all the flow from the proposed development and directs it to an on-site wastewater treatment unit. This unit has been predesigned by Wastewater Systems International. They have designed and installed these types of systems on many different Hawaiian Islands as well as the mainland, and they are very familiar with the DOH standards. This particular system has a projected capacity of 40,000 GPD.

These values were calculated using the Hawaii Administrative Rules, DOH Wastewater Systems Standards. Estimates were also done using City and County of Honolulu Standards to verify the flow quantities.

These are preliminary numbers based on projected restaurant seat counts and estimated patrons. Aggressive numbers were used to ensure that the system is not under designed and can work at a higher capacity than expected. DOH will have final review and approval of the design and verification of the flow calculations.

The wastewater treatment unit will produce R-2 Water (disinfected secondary reclaimed water) and will likely need to be checked on a monthly basis. This water is suitable for subsurface irrigation, although it may not be cost effective for the project. Even if the treated water is used for irrigation, a seepage pit would still be necessary because it is too much water to use every day. The simplest solution is to divert the R-2 Water into a seepage pit sized for 40,000 GPD. Depending on the size and condition of the existing on-site cesspool, it could possibly be converted into a seepage pit to help reduce construction costs. Typically these types of systems are required to have a backup seepage pit in the event that something happens to the first one, so two seepage pits are proposed in the parking area. In terms of water quality, further treatment could bring the effluent status down to R-1 (significant reduction in viral and bacterial pathogens). At that quality, it could be used for spray irrigation, but that would increase the cost of the system itself as well as require daily monitoring/testing and would not be cost effective for this Project.

A Preliminary Sewer Plan has been prepared as Figure 3-7 on the next page.



1 PRELIMINARY SEWER PLAN
SCALE: 1"=20'

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REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

PRELIMINARY SEWER PLAN

SCALE:

DRAWN BY: | CHECKED BY:

PROJECT NO. | DRAWING NO.

DATE: | **FIGURE 3-7**

APPENDIX A: DRAINAGE RUNOFF CALCULATIONS

Hale'iwa Commercial Redevelopment

Existing

critical @ 5minutes

	Area No.	Tributary Area	Area (SF)	Area (acres)	C	TC* minutes	CF	I_{10} 1.85	I_{50} 2.75	Q_{50}	Q_{50} cfs	Drains to
Flow outside	A	Parking & Building	5,525.85	0.127	0.90	5.00	2.775	5.13	7.63	0.87	0.87	Kamehameha
	B	Parking & Building	47,591.68	1.093	0.90	5.00	2.775	5.13	7.63	7.50	7.57	towards proposed detention pond
		Grass	123,526.26	2.836	0.35	5.00	2.775	5.13	7.63	7.57		
Offsite		from pipe									29.50	towards proposed detention pond
Offsite	**West**	Paved		0.000	0.90	5.00	2.775	5.13	7.63	0.00	5.57	towards proposed detention pond
		Unpaved	90,845.78	2.086	0.35	5.00	2.775	5.13	7.63	5.57		
Offsite	**Southern**	Paved	13,188.37	0.303	0.90	5.00	2.775	5.13	7.6316	2.08	4.01	towards proposed detention pond
		Unpaved	31,509.85	0.723	0.35	5.00	2.775	5.13	7.6316	1.93		
Offsite		from 18" pipe	pipe is 18" PVC with slope 1.3%								17.30	towards proposed detention pond

Totals **7.167** **acres** **64.83** **cfs**

Hale'iwa Commercial Redevelopment

Proposed

critical @ 5minutes

	Area No.	Tributary Area	Area (SF)	Area (acres)	C	TC* minutes	CF	I_{50} 2.75	Q_{50} cfs		Drains to
	1	Paved	73542.898	1.688	0.90	5.00	2.775	7.63	11.60	17.92	towards proposed detention pond
		Landscaped	103100.737	2.367	0.35	5.00	2.775	7.63	6.32		
Offsite		from pipe								29.50	towards proposed detention pond
Offsite	**West**	Paved		0.000	0.90	5.00	2.775	7.63	0.00	5.57	towards proposed detention pond
		Landscaped	90,845.78	2.086	0.35	5.00	2.775	7.63	5.57		
Offsite	**Southern**	Paved	13,188.37	0.303	0.90	5.00	2.775	7.63	2.08	4.01	
		Landscaped	31,509.85	0.723	0.35	5.00	2.775	7.63	1.93		
Offsite		from 18" pipe	pipe is 18" PVC with slope 1.3%							17.30	towards proposed detention pond

Totals **7.167** **acres** **74.30** **cfs**

INCREASE **9.47** **cfs**

DETENTION VOLUME if post-pre runoff is detained

Det. Vol. = ½ x (9.47) x (60) x (60)
= 17,050.17 cf
= 631.49 cy

DETENTION VOLUME if post runoff is detained

Det. Vol. 1 = ½ x (74.30) x (60) x (60)
= 133,740.78 cf
= 4,953.36 cy

APPENDIX B: BOARD OF WATER SUPPLY ACKNOWLEDGEMENT LETTER

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

RECEIVED
JAN 13 2011

PETER B. CARLISLE, MAYOR

RANDALL Y. S. CHUNG, Chairman
ANTHONY R. GUERRERO, JR.
WILLIAM K. MAHOE
THERESIA C. McMURDO
ADAM C. WONG

GEORGE "KEOKI" MIYAMOTO, Ex-Officio
JEFFREY CHANG, Ex-Officio

WAYNE M. HASHIRO, P.E.
Manager and Chief Engineer

DEAN A. NAKANO
Deputy Manager

January 4, 2011

Mr. Haku Milles, P.E.
Lyon Associates, Incorporated
841 Bishop Street, Suite 2006
Honolulu, Hawaii 96813

Dear Mr. Milles:

Subject: Your Letter Dated December 21, 2010 Requesting the Availability of Water to the Proposed Commercial Redevelopment Project, TMK: 6-6-4:13, 14, 15, 16, 17, 18, 19, 27, 28, 32

Thank you for the opportunity to comment on the proposed redevelopment.

The existing water system is presently adequate to accommodate the proposed redevelopment. However, please be advised that this information is based upon current data and, therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of your building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

PAUL S. KIKUCHI
Chief Financial Officer
Customer Care Division

APPENDIX C: WASTEWATER FLOW CALCULATIONS

Hale'iwa Commercial Redeveopment
Wastewater Flow Calculations

			OFFICE	RETAIL	FOOD & BEVERAGE							
ITE Land Use #	TOTAL GBA	TOTAL GLA	710	820	933	932	931	Seats	Employees	Additional Patrons	Notes	GPD
Building			Gen. Office	Shopping Center	Fast Food (w/out Drive thru)	High Turn Over (Sit Down Rest.)	Quality Restaurant					
Retail 1 (Includes Aoki's)	6,509	6,300		3,150	3,150			126	16		50/50% split on retail vs. fast food, 15 sf pp	12,920
Retail 2	1,324	1,254		1,254					3			60
Retail 3	1,320	1,255		1,255					3			60
Retail 4	2,551	2,500		2,500					6			120
Retail 5	1,695	1,600		1,600					4			80
Retail 6	611	611		611					2			40
Haleiwa Eats (Retail)	1,250	1,250		1,250					3			60
Matsumoto Existing	1,296	1,296										
Matsumoto Add On	1,487	1,410		2,361	787				8	500	Estimated as Shave Ice and Fast Food customers at 3 gallons/person (Takeout)	1,660
Matsumoto Lanai	442	442										
Fruit Stand	550	500		500					1			20
Restaurant 1	2,623	2,500				2,500		75	6		20 sf pp in FOH area (60%)	6,120
Restaurant 2 (Global Creations)	1,612	1,612				2,612		78	7		20 sf pp in FOH area (60%)	6,409
Restaurant 2 (Add on)	1,061	1,000										
Restaurant 2 (Outdoor)		900				900		45	2		20 sf pp	2,965
Restaurant 3	2,690	2,500					2,500	60	6		25 sf pp in FOH area (60%)	4,020
Restaurant 3 (Outdoor)		700					700	28	2		25 sf pp	1,860
Office	1,578	1,500	1,500						4			80
Other Users									5	500	Estimated as additional bathroom users at 3 gallons/person	1,600
Support Area	1,571											
TOTAL	**30,170**	**29,130**	**1,500**	**14,481**	**3,937**	**6,012**	**3,200**	**412**	**78**		**Total including Outdoor seating**	**38,074**
TOTAL w/out OUTDOOR	**30,170**	**27,530**	**1,500**	**14,481**	**11,549**			**339**	**74**		**Total excluding Outdoor seating**	**33,249**

TOTAL	OFFICE	RETAIL	F&B	
100%	5%	50%	45%	**Total including Outdoor seating**
102%	5%	53%	44%	**Total excluding Outdoor seating**

Assumptions:
Flows are based on Chapter 62 of Title 11, Hawaii Administrative Rules, entitled "Wastewater Systems" Appendix F, Table 1.
Seats calculated on 60% Front of House (FOH) area, 40% (BOH) and 20-25 sf per seat as noted.
Restaurant 3 is high quality and will likely not serve breakfast. Flow per seat has been reduced from 80 to 65 GPD.
It is anticipated that the Outdoor seats will be less occupied. Flow per seat has been reduced from 80 to 65 GPD.
Additional Patrons are estimated as fast food takeout meals at 3 GPD.
Employees are estimated as 1 per 400 sf of GLA; usage estimated at 20 GPD per DOH standards.
Employees under Other Users accounts for site maintanence staff.

Appendix F
ARCHAEOLOGICAL INVENTORY SURVEY REPORT

DRAFT:
Archaeological Inventory Survey, Hale‘iwa Redevelopment Entitlements Project, Kawailoa Ahupua‘a, Waialua District, O‘ahu TMK: [1] 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028 & 032

Prepared for

Group 70 International, Inc.

Prepared by

Constance R. O’Hare, B.A.,

Rosanna Runyon, B.A.,

Douglas Borthwick, B.A.,

David W. Shideler, M.A.,

and

Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.

Kailua, Hawai‘i

(Job Code: PAALAA 1)

May 2011

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Ph: (808) 242-9882
Fax: (808) 244-1994

Management Summary

Reference	Archaeological Inventory Survey, Hale‘iwa Redevelopment Entitlements Project, Kawailoa Ahupua‘a, Waialua District, O‘ahu TMK: [1] 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028 & 032 (O’Hare et al. 2011)
Date	May 2011
Project Number (s)	Cultural Surveys Hawai‘i job code: PAALAA 1
Investigation Permit Number	CSH completed the fieldwork component of the archaeological inventory survey (AIS) under Hawai‘i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR) permit Nos. 10-10 (2010), and 11-17 (2011) issued per Hawai‘i Administrative Rules (HAR) Chapter 13-13-282.
Project Location	The project area comprises TMK [1] 6-6-004: 013, 014, 015, 016, 017, 018, 019, 027, 028, and 032, which is bounded to the north by Mahaulu Lane, to the east by Kamehameha Highway, to the south by Kewalo Lane, and to the west by an undeveloped flood zone area. The project area is depicted on the 1999 U.S. Geological Survey 7.5-minute series topographic map, Haleiwa Quadrangle.
Land Jurisdiction	Kamehameha Schools Bishop Estate
Agencies	SHPD/DLNR
Project Description	The proposed redevelopment aims to expand existing retail frontage with a combination of new inline storefronts and the selective renovation of existing historic storefront establishments like Matsumoto Shave Ice, upgrade the property’s infrastructure, and improve the common areas (with a newly constructed parking lot and gathering area).
Project Acreage	Approximately 4.22 acres (17,078 square meters)
Area of Potential Effect (APE) and Survey Acreage	The APE for the current AIS investigation is defined as the entire 4.22 acre project area.
Historic Preservation Regulatory Context	This document was prepared to support the proposed project's historic preservation review under Hawai‘i Revised Statutes (HRS) Chapter 6E-42 and HAR Chapter 13-13-284. In consultation with SHPD/DLNR, the Archaeological Inventory Survey (AIS) investigation was designed to fulfill the State requirements for an AIS, per HAR Chapter 13-13-276.

Fieldwork Effort	On October 29, 2010, a crew from CSH conducted a surface survey of the project area. No traditional archaeological features were observed, however the presence of concrete foundations and six intact historic structures, five of which are currently listed as significant historic structures within the Hale‘iwa Special District boundary, were identified. The intact structures will be addressed in a separate study in consultation with the Architecture Branch of the SHPD. On November 23, 2010 and March 9, 2011, a crew from CSH monitored and documented trench excavations, recorded project stratigraphy, and took GPS points of all trench locations. The subsurface testing program consisted of the excavation of ten trenches, comprising a total of approximately 40 m^2 or approximately 0.2% of the project area.
Number of Historic Properties Identified	Two; State Inventory of Historic Properties (SIHP) # 50-80-04-7151 and SIHP # 50-80-04-7152
Historic Properties Recommended Eligible to the Hawai‘i Register of Historic Places (Hawai‘i Register)	SIHP # 50-80-04-7151, agricultural *lo‘i* sediment recorded throughout the west half of the project area; SIHP # 50-80-04-7152, five historic concrete foundations (Features A-E) located in the southern half of the project area
Effect Recommendation	The proposed project will adversely affect the documented historic properties. CSH’s project specific effect recommendation is “effect, with agreed upon mitigation measures” (HAR Chapter 13-284-7). 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	Due to the presence of agricultural deposits (SIHP # -7151), historic foundations (SIHP # -7152) and existing historic buildings, it is likely that pre- and post- contact cultural materials and/or intact subsurface features may be encountered during construction activities related to the proposed project. In consultation with the landowner, archaeological monitoring is recommended. The specifics of the monitoring work will be specified within an Archaeological Monitoring Plan for the review and approval of the SHPD prior to project construction. No further historic preservation work, other than mitigation in the form of archaeological monitoring, is recommended for SIHP #’s 50-80-04-7151 and -7152. 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.

Table of Contents

Management Summary ..... **i**

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1.1 Project Background 1
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1.4.1 Natural Environment 8
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Section 1 Introduction

1.1 Project Background

At the request of Group 70 International, Inc. (924 Bethel St, Honolulu), Cultural Surveys Hawai‘i, Inc., (CSH) conducted an archaeological inventory survey for the Hale’iwa Redevelopment Entitlements Project, Kawailoa Ahupua‘a, Waialua District, O‘ahu, TMK: [1] 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028 & 032. The project area is shown on a 1999 U.S. Geological Survey map, a Hawai‘i State tax map, and on a 2005 aerial photograph (Figure 1 to Figure 3). The project area is within the town of Hale‘iwa, which extends along the coast in portions of both Kawailoa Ahupua‘a (north) and Pa‘ala‘a Ahupua‘a (south). The project area comprises ten parcels, approximately 4.22 acres in total, which are bound to the north by Mahaulu Lane, to the east by Kamehameha Highway, to the south by Kewalo Lane, and to the west by an undeveloped flood zone area.

Kamehameha Schools (KS) is proposing to redevelop its commercial properties located in Hale‘iwa along Kamehameha Highway from Mahaulu Lane to Kewalo Lane. The project site is bordered by retail stores to the north, Kamehameha Highway to the east, Hale‘iwa Town Center to the south, and agricultural lands to the west. The neighborhoods surrounding the project site consist primarily of low-rise residential and low-rise commercial uses.

The intent of this redevelopment Project is to revitalize existing businesses and provide essential infrastructure, while retaining the rural scale and plantation character of the Hale‘iwa Special District. The redevelopment will expand existing retail frontage with a combination of new in-line storefronts and preservation or reconstruction of selected historic buildings. The Project will also increase pedestrian pathways and safety, provide a central gathering place, and improve traffic flow with a newly constructed rear parking lot. In March of 2008, Kamehameha Schools (KS) completed the North Shore Master Plan. The plan consisted of the following six general planning elements:

- Increase natural and culture resource stewardship and management;
- Expand educational opportunities;
- Establish alternative energy uses;
- Enhance diversified agriculture & food production;
- Develop/redevelop rural commercial; and,
- Develop rural residential.

The plan called for seven catalyst projects as part of the implementation process. This project specifically addresses Phase 1 (Entitlement & Predevelopment Phase) of Catalyst Project #4 “Matsumoto Redevelopment Project. This redevelopment project includes a number of well-known enterprises including Matsumoto’ Shave Ice, Aoki’s Shave Ice, ‘Iwa Gallery, Global Creations and Hale‘iwa Eats, all fronting Kamehameha Highway, as well as significant parking areas and relatively undeveloped lands in back and north (*makai* or inland) of the enterprises fronting Kamehameha Highway. The Hale‘iwa Redevelopment plan (Figure 4 and Figure 5) states:

> The proposed redevelopment aims to expand existing retail frontage with a combination of new inline storefronts and the selective renovation of existing

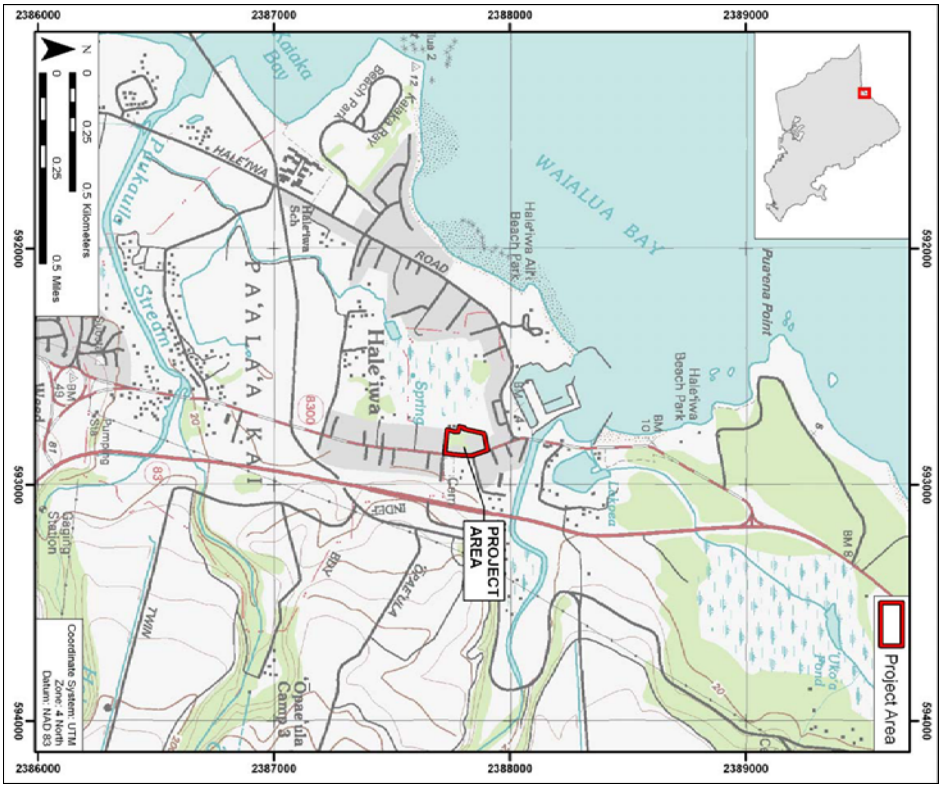

Figure 1. 1999 U.S. Geological Survey (USGS) Map topographic map of O'ahu, Haleiwa Quadrangle, depicting location of current project area

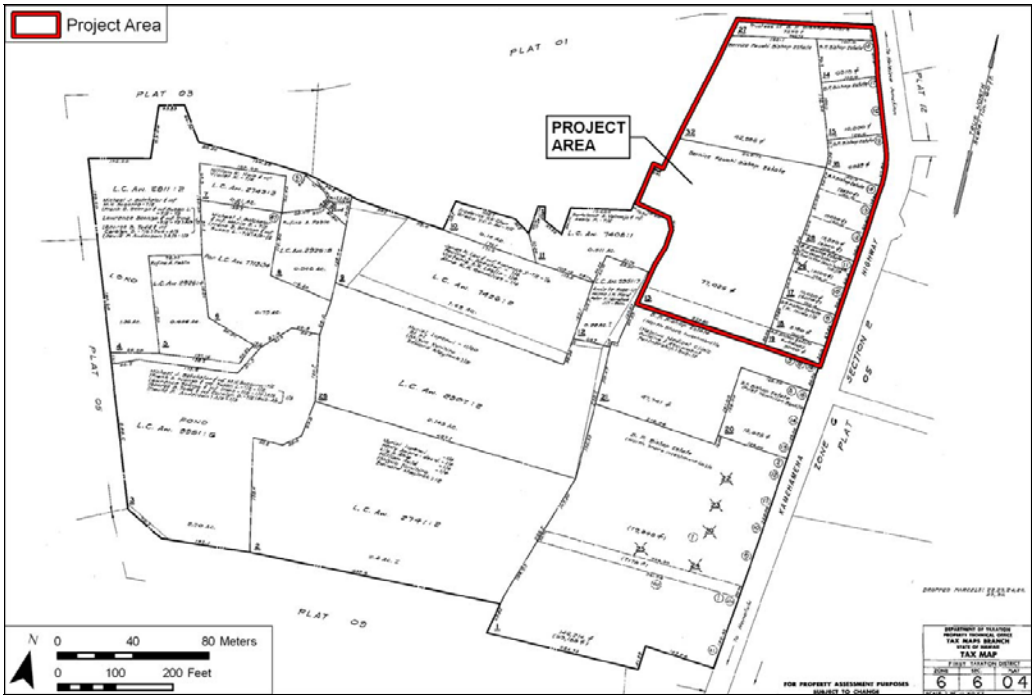

Figure 2. Tax Map Key (TMK) plat map [1] 6-6-004 showing project area (Hawai'i TMK Service)

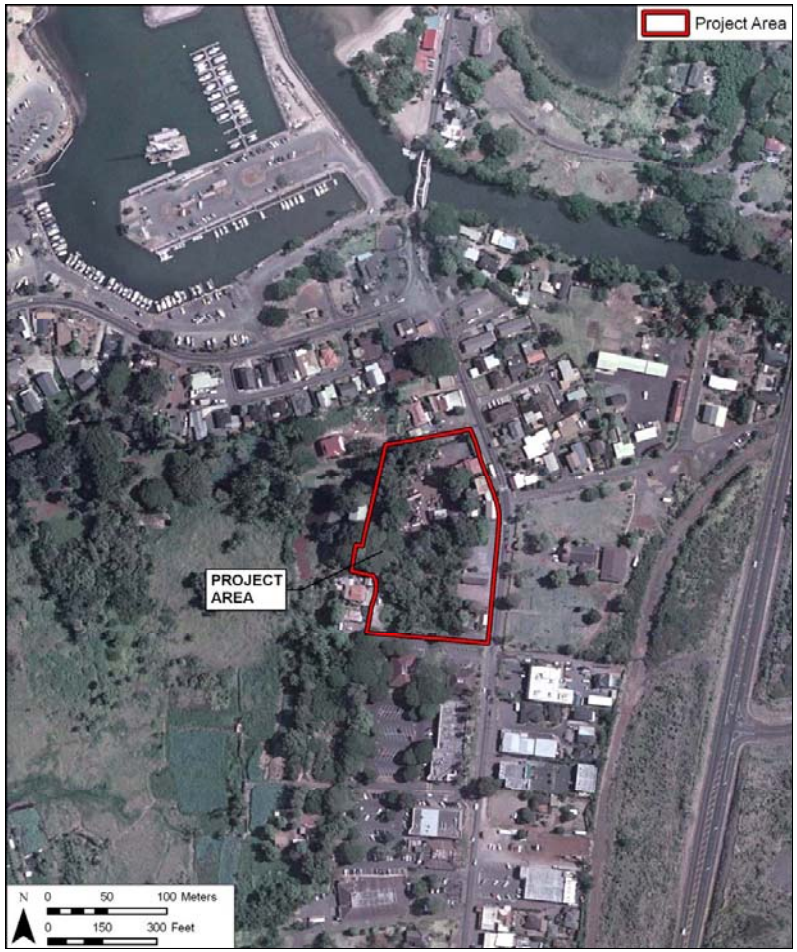

Figure 3. 2008 Aerial photograph (Google Earth 2008) showing project area

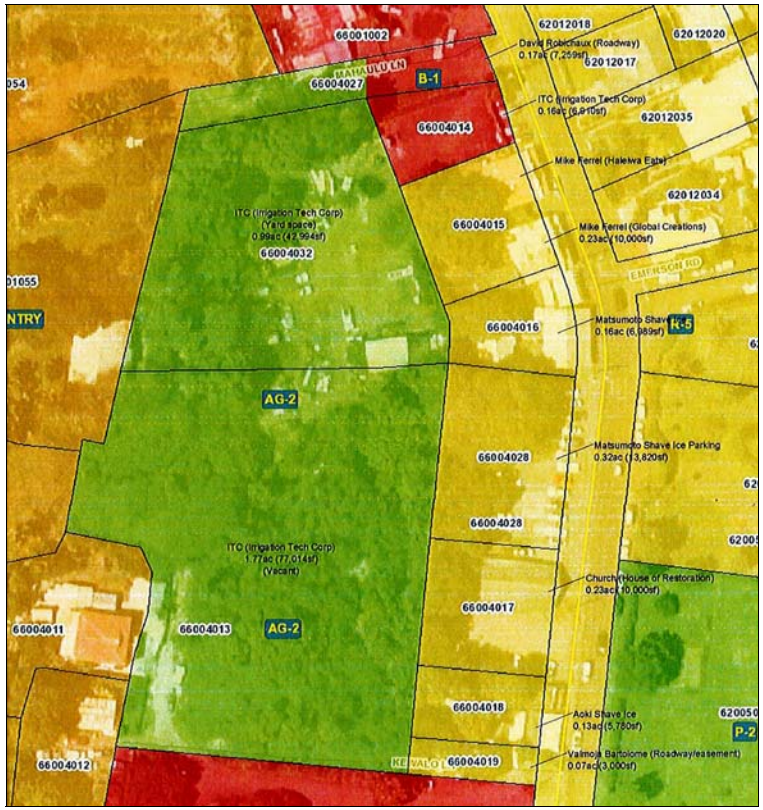

Figure 4. Zoning map for project area, with lessees of TMK parcels (map provided by client)

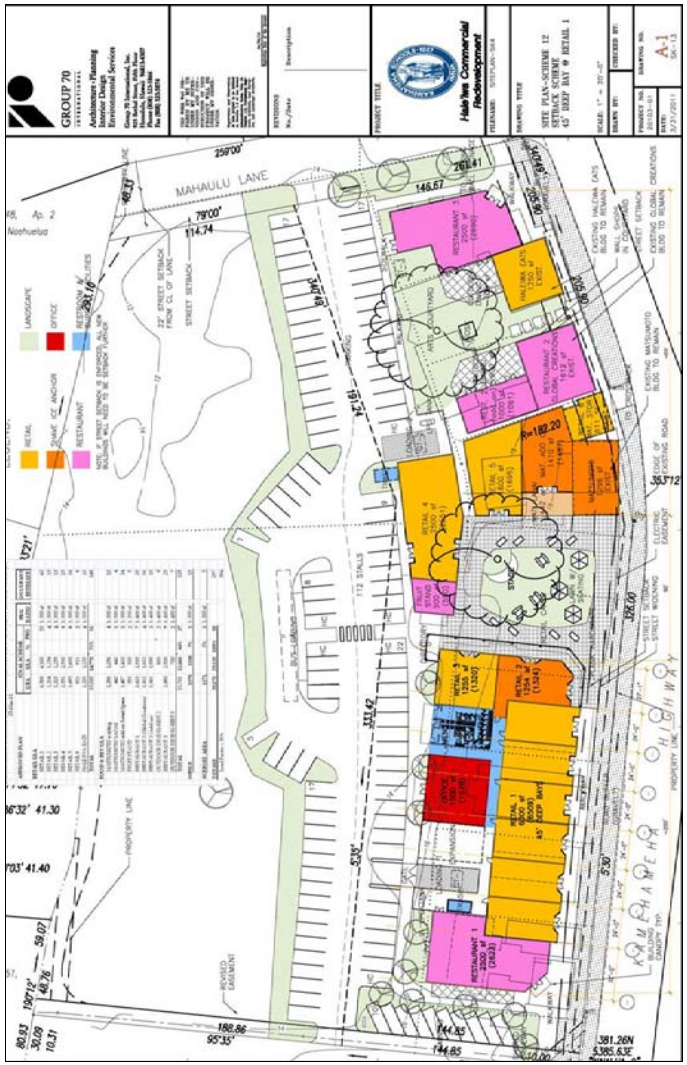

Figure 5. Preliminary Hale'iwa Redevelopment Entitlements Site Plan (map provided by Group 70)

historic storefront establishments like Matsumoto Shave Ice, upgrade the property's infrastructure, and improve the common areas (with a newly constructed parking lot and gathering area.

This document was prepared to support the proposed project's historic preservation review under Hawai'i Revised Statutes (HRS) Chapter 6E-42 and HAR Chapter 13-13-284. In consultation with SHPD/DLNR, the Archaeological Inventory Survey investigation was designed to fulfill the State requirements for an Archaeological Inventory Survey, per HAR Chapter 13-13-276.

1.2 Parcel Descriptions

In 2010, an Environmental Site Assessment (ESA) for the project was submitted to Kamehameha Schools (Bureau Veritas 2010). This report included information on the individual parcels and the present structures on the parcels. The material from this ESA report is summarized in Table 1.

Table 1. Kamehameha Schools Hale'iwa Parcel Descriptions

Parcel*	Sq. Ft.	Present Structures
013	77,025	Storage yard for ITC Water Management (ITC) equipment and supplies at north end; concrete slabs from previous structures
014	6,910	Asphalt parking lot at northeastern corner. A propane tank, loading dock, and air conditioning units are on the parcel.
015	15,000	Three single-story structures (from north to south): Hale'iwa Eats (Thai Restaurant), Global Creations (Art Gallery), ITC office building
016	6,989	One single-story structure: Matsumoto Store and Shave Ice
017	10,000	One single story structure – House of Restoration Church
018	5,780	Two single-story structures: Aoki's Shave Ice, and 'Iwa Gallery
019	3,000	Unpaved driveway (Kewalo Lane)
027	7,259	Asphalt-paved roadway (Mahaulu Lane) to ITC and private off-site residences
028	13,820	Concrete/gravel parking lot for Matsumoto Store and the House of Restoration Church
032	42.085	ITC storage yard for equipment and supplies

*Tax Map [1] 6-6-004:

1.3 Scope of Work

The following archaeological inventory survey scope of work was designed to satisfy the Hawai‘i state requirements for archaeological inventory surveys (Hawai‘i Administrative Rules [HAR] Chapter 13-276 and Chapter 13-275/284):

1. Historical research to include study of archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near this property.
2. Limited field inspection and subsurface testing on the project area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites. This assessment will identify any sensitive areas that may require further investigation or mitigation before the project proceeds.
3. Preparation of a report to include the results of the historical research and the limited fieldwork with an assessment of archaeological potential based on that research, with recommendations for further archaeological work, if appropriate. It will also provide mitigation recommendations if there are archaeologically sensitive areas that need to be taken into consideration.

1.4 Environmental Setting

1.4.1 Natural Environment

The western (*makai*) half of the project area is Haleiwa Silty Clay, 0 to 2 percent slopes (HeA) and the eastern (*mauka*, inland) half is Kawaihapai Clay Loam, 2 to 6 percent slopes (KIB) (Figure 6). The Haleiwa series consists of deep, well drained soils that formed in alluvium derived from basic igneous material. They are found on fans and in drainageways along the coastal plains at elevations from sea level to 250 feet. The Kawaihapai series consists of well drained soils that formed in alluvium derived from basic igneous rock in humid uplands. They are found in drainageways and on alluvial fans on the coastal plains at elevations from sea level to 300 feet.

The natural topography of the project area is level, with thick vegetation and large trees. The flora in the project area was all introduced species, no plant species endemic to the islands were observed during the survey. The vegetation observed on survey included exotic grasses, Java plum (*Syzygium cumini*), date palm (*Phoenix dactylifera*), red hibiscus (*Hibiscus rosa-sinensis*), *‘opiuma* (*Pithecellobium dulce*), monkey pod trees (*Albizia saman*), mother-in-law’s tongue (*Sansevieria trifasciata*) and ficus trees (*Ficus benjamina*).

1.4.2 Built Environment

The project area is covered with several small stores fronting Kamehameha Highway. There are two houses behind this frontage. Roughly half of the area of the project area is dozed, leveled, and paved with basalt gravel, where movable storage containers and wooden storage sheds were built in place to store tools and other equipment for a base yard.

Figure 6. Soils map of project area (Soil boundaries from Foote et al. 1974)

Section 2 Methods

Background research included a review of previous archaeological studies on file at the SHPD/DLNR library at Kapolei, Hawai‘i, and a review of cultural history documents, maps, and photographs at the CSH library in Waimānalo, the University of Hawai‘i at Mānoa Hamilton Library, the Hawai‘i State Archives, the Bishop Museum Archives, and the map collection of the Kamehameha Schools. Information on Land Commission Awards was accessed through Waihona ‘Aina Corporation’s *Māhele* Data Base (Waihona ‘Aina Corporation (www.waihona.com).

2.1 Field Inspection

On October 29, 2010, Todd Tulchin, B.S., Nifae Hunkin, B.A., and Douglas Borthwick, B.A., completed the field inspection under the overall supervision of Hallett H. Hammatt, Ph.D. (principal investigator). CSH conducted the field inspection under state archaeological fieldwork permit No. 10-10 issued by SHPD/DLNR, per HAR Chapter 13-13-282. The field effort required approximately 14 person hours to complete.

2.2 Limited Subsurface Testing

On November 23, 2010 and March 9, 2011, limited subsurface testing was performed by a crew of CSH archaeologists; Douglas Borthwick, B.A, Rosanna Runyon, B.A., Douglas Thurman, B.A., and Josephine Paolello, M.A, under the overall supervision of Hallett H. Hammatt, PhD. (principal investigator). Subsurface testing required approximately 48 person hours to complete. The fieldwork was completed under state archaeological fieldwork permit No. 10-10 (2010) and 11-17 (2011) issued by SHPD/DLNR, per HAR Chapter 13-13-282.

A total of ten backhoe test trenches (Trench 1-10) were excavated and documented. A standard backhoe with a two-foot wide bucket (approximately 60 cm) was used to excavate each trench. Test trenches generally ranged from 3.5 m to 7.5 m long by 0.85 m wide, depending on ease of access. Trenches were excavated to the water table or basalt bedrock. Test trenches were distributed throughout the project area to provide representative coverage, assess stratigraphy, and identify the potential for subsurface cultural deposits.

Each test trench was documented with a scale section profile, photographs, and sediment descriptions. Sediments were described for each of the trenches using USDA soil description observations/terminology. Sediment descriptions included 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. Photographs included a two meter long photo scale for reference.

2.2.1 Collection of Artifacts and Sampling

Only sparse cultural material was observed during this project investigation. No diagnostic (dateable) post-contact artifacts were observed. Non-diagnostic modern to possibly historic (older than 50 years) trash including ceramic sherds, glass fragments, and metal debris was

observed on the current ground surface and in upper fill layers and was not collected. These items were not collected due to their lack of diagnostic attributes and unknown original context.

Sampling of stratigraphic layers was carried out in order to characterize the cultural content contained within natural strata and to establish geographic boundaries of stratigraphic layers. The samples were excavated out of the sidewall, or from the backhoe bucket, into five gallon (c. 20 liter) buckets and/or into two-gallon (7.5 liters) plastic bags. The collected samples contained very wet sediments and were collected in bulk. Samples were bagged by provenience and are stored in the CSH laboratory.

2.2.1.1 Global Positioning System (GPS) Documentation

Global Positioning System (GPS) points were taken of trench locations using Trimble Pro XH mapping grade GPS survey technology, with a TSCI Datalogger and real-time differential correction. This unit provides sub-meter horizontal accuracy in the field. GPS field data was post-processed, yielding horizontal accuracy between 0.5 and 0.3 m. GPS location information was converted into GIS shape files using Trimble’s Pathfinder Office software, version 2.80, and graphically displayed using ESRI’s ArcGIS 9.1.

2.3 Laboratory Methods

Bulk sediment samples were collected from natural stratigraphic layers observed within the excavated trenches. Collected samples were analyzed using current standard archaeological laboratory techniques. Due to the organically-enriched clay composition of the samples, they were soaked in a bucket of water to allow for light fraction materials (roots, charcoal, seeds, etc.) to float to the top. The water portion and light fraction was then drained into a 1/32” screen with materials collected. Remaining sediment at the base of the bucket was screened through a 1/8” screen with materials collected. All collected materials were set to dry and were then analyzed and tabulated into chart form.

Organic materials (roots, charcoal, seeds, etc.), faunal materials (marine shells, animal bone, etc.), and other miscellaneous materials (basalt, decomposing basalt, coral, etc.) were sorted and bagged. All identified artifacts were photographed.

2.4 Document Review

Historic and archival research included information obtained from the UH Mānoa Hamilton Library, the State Historic Preservation Division Library, the Hawai‘i State Archives, the State Land Survey Division, and the Archives of the Bishop Museum. Previous archaeological reports for the area were reviewed, as were historic maps and primary and secondary historical sources. Information on Land Commission Awards was accessed through Waihona ‘Āina Corporation’s Māhele Data Base (<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.

Section 3 Traditional Background Research

3.1 Place Names

The rich taro lands of the Waialua District were located near the coast in the *ahupua‘a* (large land division) of Kamananui, Pa‘ala‘a, and Kawailoa, on the eastern end of the district. The boundary between Pa‘ala‘a to the south and Kawailoa to the north was generally along the ridge east of ‘Ōpae‘ula Stream. Near the coast, the boundary line diverged from the stream and extended to the center of Waialua Bay, between the Anahulu Stream in Kawailoa and the ‘Ōpae‘ula Stream in Pa‘ala‘a. This divergent boundary line bisected a marshy wetland area at the coast, which was used by the Hawaiian inhabitants to grow taro in their *lo‘i* (irrigated fields). This rich taro land was shared by the Kawailoa and Pa‘ala‘a inhabitants (Sahlins 1992:176). The boundary between Kawailoa and Pa‘ala‘a at the coast is labeled as “indeterminate” on many historic maps, but it can be generally determined by testimony from mid-nineteenth century land claim documents.

Based on this information, the current project area is within the *ahupua‘a* of Kawailoa. However, due to the indefinite boundary, the area surrounding the current project area is sometimes identified as Pa‘ala‘a Ahupua‘a or Pa‘ala‘a Kai (seaward Pa‘ala‘a). As early as 1883, as shown on a map entitled the “Konohiki Lands in Paalaa” (Figure 7), historic maps designated the former taro lands west of the Anahulu River near the coast as part of “Pa‘ala‘a Lands.” Pa‘ala‘a Kai Subdivision was built in this area in 1915, and the surrounding area today is often referred to by the same name, although the project area is still officially within the *ahupua‘a* of Kawailoa. For this report, the background section will focus on the coastal areas of Pa‘ala‘a and Kawailoa Ahupua‘a near Waialua Bay.

The exact derivation of the name “Pa‘ala‘a” is uncertain. Pa‘ala‘a means “the sacred firmness” (Pukui et al. 1974:173), which may relate to the Pōhaku Lanai tradition which indicates that the massive rock on Kalaeo‘iupaoa Point, said to be sacred to the god Kāne, floated from Kahiki (ancestral Hawaiian land) and became fixed there. Pa‘ala‘a is also the name of a wind that has been poetically referred to as a “breath of air for those of the royal court” (Pukui and Elbert 1971:100, 273). Kawailoa means “the long water” (Pukui et al. 1974:98) and is said to be named for the Anahulu River/Kawailoa Gulch, which extends from the Ko‘olau Mountains to the sea and is the longest river on O‘ahu (Bryan 1954, cited in Sterling and Summers 1978:117).

3.1.1 Pa‘ala‘a Place Names

Place names found in land documents and on historic maps for Pa‘ala‘a are listed in Table 2. Place names have been compiled by Lloyd Soehren for his Hawaiian Place Name database at the Ulukau internet site (ulukau.org). Soehren includes place name meanings from Pukui et al.’s (1974) definitive text, *Place Names of Hawaii.* When no meaning is given in this text, Soehren sometimes suggests a place name for simple words based on Pukui and Elbert’s (1986) *Hawaiian Dictionary.*

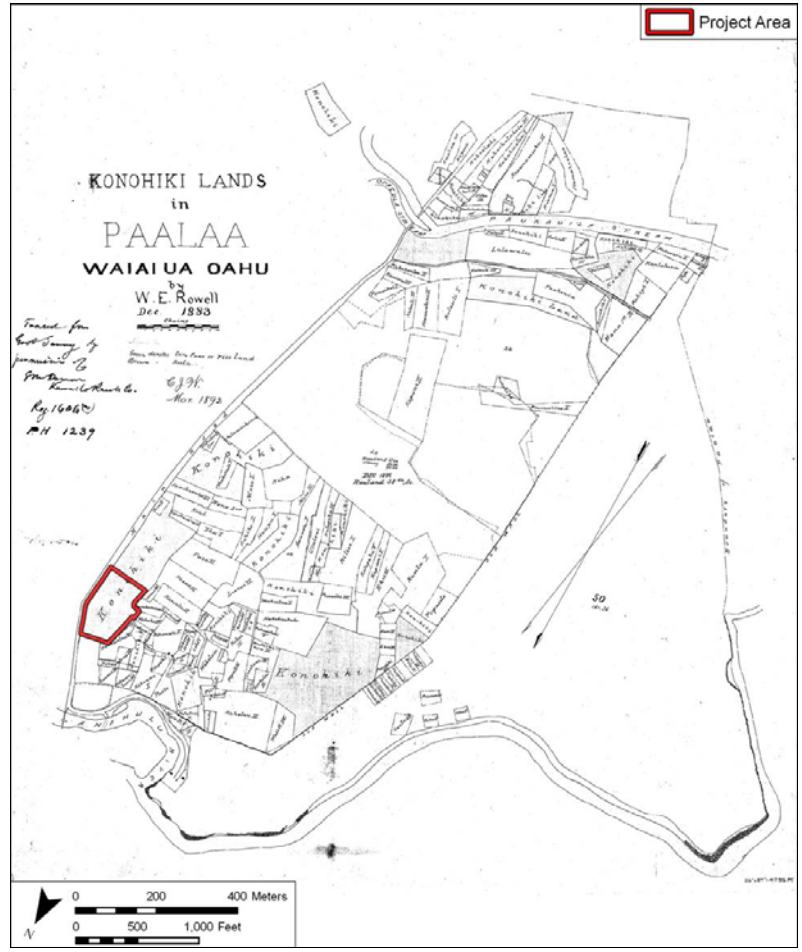

Figure 7. 1883 map of Pa‘ala‘a Lands by W. E. Rowell, depicting project area within lands for the *konohiki* (land manager) of the Victoria Kamāmalu estate (Registered Map No. 1606, part II, Hawai‘i Land Survey Division)

Pa‘ala‘a generally extended along the shore at Kaiaka (“shadowed sea”) Point on Kaiaka Bay to the near the western side of Waialua Bay. It extended to the Ko‘olau Mountain Range on the side of the ‘Ōpae‘ula (“red shrimp”) Stream on the north and the side of the Helemano (“many snared,” or “many going”) Stream to the south. These two streams join near the coast to form the Paukauila Stream. There are some alternate names for this stream. In mid-nineteenth century land documents, ‘Ōpae‘ula Stream is sometimes referred to as Alamuki, Helemano is called Mamalio, and Paukauila Stream is called Laukī‘ha‘a.

Kaiaka Point, or Kalaeo‘iupaoa Point, on the east side of Kaiaka Bay, was the site of a large balancing rock, or *pōhaku*, called Pōhaku o Lana‘i. The point near the northern coastal boundary of Pa‘ala‘a was called Kūpaoa (“overwhelming smell”) as it was near Kahakakau Kanaka, a *heiau* (ceremonial structure) used for human sacrifices. In the 1930s, Gerald McAllister of the Bishop Museum, conducted a survey of important sites on the island of O‘ahu. He recorded eight sites in Pa‘ala‘a, comprised of the *heiau* of Kapukapuākea, Lonoakeahu, Pu‘upilo, and Hekili, the altars of Punakai and Kumailianuu, the *ko‘a* (fishing shrine) of Ka‘ohe, the Pōhaku Lana‘i at Kaiaka Point, Kūpaoa Point (part of Hekili Heiau site), the residence of a *kahuna* (priest) called Punakai, the site of the Halemano cannibal feasts at the Pā‘aikanaka enclosure, and Laukī‘aha Spring.

Several other place names are mentioned in mid-nineteenth century land documents: seven ‘*ili* (small land divisions within *ahupua‘a*) names, A‘akala, Hānau‘ewa, Kalie, Kealapi‘i, Kūmalie, Laukīha‘a, and Waikaalulu; one *loko* (pond) called Punamoe, and one *pali* (cliff) called Lā‘aukalakala. The seaward portion of Pa‘ala‘a was called Pa‘ala‘a Kai and the upland portion was called Pa‘ala‘a Uka. The upland forest area was Halemano, or Helemano, and a place with a spring was called Kauikua.

Table 2. Place Names of Pa‘ala‘a Ahupua‘a

Place Name	Type	Meaning	Comments
Pa‘ala‘a	*ahupua‘a*	sacred firmness (Pukui et al. 1974)	Recorded in Land Commission Award testimony
A‘akala	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Hānau‘ewa	*‘ili ‘āina*	possibly, premature birth (Pukui & Elbert 1986)	Recorded in Land Commission Award testimony
Helemano / Halemanu	*‘ili ‘āina*	many snared, or many going (Pukui et al. 1974)	Recorded in Land Commission Award testimony
‘Īna‘ikumu	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Kalie	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Kealapi‘i	*‘ili ‘āina*	the ascending road (Pukui & Elbert 1986)	Recorded in Land Commission Award testimony

Place Name	Type	Meaning	Comments
Kūmalie	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Laukī‘ha‘a	*‘ili ‘āina*	low *laukī* shrub (Pukui & Elbert 1986)	Recorded in Land Commission Award testimony
‘Ōpae‘ula	*‘ili ‘āina*	red shrimp (Pukui et al. 1974)	Recorded in Land Commission Award testimony
Waikaalulu	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Alamuki	stream	now ‘Ōpae‘ula	Land Commission Award testimony
Hale‘iwa	town	home of the attractive people (Clark 2002:88); beautiful home (for the hotel); house [of] frigate bird (Pukui et al. 1974)	Named for dormitory of girl’s school, later adopted as the name of the Hale‘iwa Hotel and the town
Hekili	*heiau*, *pu‘uhonua* (place of refuge)	thunder (Pukui et al. 1974)	“Site 223. Hekili heiau, Pa[a]laa-uka, on the sea side of the twin bridges at Waialua. The site is said to be occupied by the Buddhist temple. Thrum was told that the heiau was of *luakini* (chiefly) class and a place of refuge. Near the heiau was a fishing shrine (*ko‘a*) known as Kaohe, according to Hookala.” (McAllister 1933:140)
Halemano / Helemano	place	many houses (Pukui et al. 1974)	Upland Pa‘ala‘a
Helemano	stream	many snared, or many going (Pukui et al. 1974)	Rises at about 2640 ft. elevation, joins ‘Ōpae‘ula Stream at 20 ft. to form Paukauila Stream
Kaiaka	point	shadowed sea. . . . named for a person (Pukui et al. 1974).	East point of Kaiaka Bay
Kalaeo‘iupaoa	point		Point on the east side of Kaiaka Bay, site of Pōhaku Lana‘i (McAllister 1933:140)
Ka‘ohe	*ko‘a*	the bamboo (Pukui et al. 1974)	“Near the [Hekili] heiau was a fishing shrine (*ko‘a*) known as Kaohe...” (McAllister 1933:140)

Place Name	Type	Meaning	Comments
Kapukapuākea	*heiau*		“Site 225. Kapukapuakea heiau, Paalaa-kai, east end of Kaiaka Bay. . . . The site is still remembered and pointed out, but nothing remains of the heiau. Thrum has this information: ‘A medium sized heiau of traditional menehune [legendary little people] construction of kauila wood, long since destroyed, said to have worked in connection with Lonoakeahu. Luuau its kahuna’ . . . Near Kapukapuakea were formerly salt pans where sea water was allowed to evaporate.” (McAllister 1933:140)
Kuaikua	place		“Kuaikua is located up in Halemano. It has a sacred spring and only those related to the supernatural ones who made and hid it, are allowed to bathe in it.” Sterling and Summers 1978:112.
Kukui‘ula	altar	red light (Pukui et al. 1974)	“Site 224. Punakai, Waialua... There is also said to have been an *unu* [altar] here by the name of Kukuiula.” (McAllister 1933:140).
Kumailiaunu	altar		“Site 222. Kumailia-unu was located on the sea side of the road just before [south of] the twin bridges in going toward Waialua.” (McAllister 1933:140)
Kūmalie	stream		LCA 2879 bounded on the east by Kūmalie *muliwai* [stream, stream mouth]
Kūpaoa	*point*	overwhelming smell (Pukui & Elbert 1986)	“Site 234. At the death of Elani, who was greatly beloved by his people, his body was placed on a ledge of rocks near Puaena Point, where it was allowed to decompose. 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 [*sic*; should be Kūpaoa in Pa‘ala‘a].” McAllister 1933:141-142.
Lā‘aukalakala	*pali* (cliff)		LCA 2802 bound on east by pali; LCA 2922:1 bound on west by pali

Place Name	Type	Meaning	Comments
Laukī‘aha	spring		“Site 221. Laukiaha, the name of a spring once flowing near the present Waialua Soda Works into the Opaeula stream, on the mountain side of the twin bridges at Waialua.” (McAllister 1933:140)
Laukīha‘a (Paukauila)	stream	low *laukī* shrub [*Cassia leschenaultiana*] (Pukui & Elbert 1986)	LCA 8826 bound on *mauka* and *makai* side by the stream; formed by the junction of ‘Ōpae‘ula Stream and Helemano Stream, joined by Kiikii Stream near the mouth.
Lonoakeahu	*heiau*		“Sites not located. 17. Lonoakeahu heiau, Keehu. Listed by Thrum: ‘A heiau of small size destroyed years ago; site now planted to cane.’" (McAllister 1933:197)
Mamalio (Helemano)	stream		The “muliwai o Mamalio” adjoins claims No. 2859B and 2856:1,2,3,4 Kea. Now called Helemano Stream on USGS maps
‘Ōpae‘ula	stream	red shrimp (Pukui et al. 1974)	Rises at about 2720 ft. elevation, joins Helemano Stream at <20 ft. to form Paukauila Stream.
Pā‘aikanaka	residence	man-eating enclosure (Pukui & Elbert 1986)	“Site 220. Pa Aikanaka, Halemano (Helemano or Halemanu), Paalaa, the site of the famous cannibal feasts of a chief on Oahu, located 8 miles east of Haleiwa in the mountains of Haupu.” (McAllister 1933:137)
Pa‘ala‘a Kai	place	seaward Pa‘ala‘a (Pukui & Elbert 1986)	USGS 1953
Pa‘ala‘a Uka	place	upland Pa‘ala‘a (Pukui & Elbert 1986)	USGS 1954
Paukauila	stream	the lightning ceases (Pukui et al. 1974)	Seaward portion of stream
Pōhaku Lana‘i	stone		“Site 226. Pohaku Lanai, a large balancing stone on Kalaeoiupaoa Point. A large oval-shaped stone 18 feet across is balanced on a smaller base, standing about 10 feet high in all. This is said to have been used as a lookout by fishermen in the region. When fish were sighted, the stone was beaten with a wooden mallet,

Place Name	Type	Meaning	Comments
			and the resulting hollow sound was sufficient to gather together the fishermen of the village.” (McAllister 1933:140); “The Hawaiians say it was a stone which floated from Kahiki.” (Sterling and Summers 1978:113)
Punakai	residence		“Site 224. Punakai, Waialua. A kahuna named Puukane lived at this place, which was known as Punakai. Whenever Puukane chanted, the poi would overflow any vessel in which it had been placed. There is also said to have been an unu [altar] here by the name of Kukuiula.” (McAllister 1933:140)
Punamoe	*loko* (pond)		LCA 7372:2

3.1.2 Kawailoa Place Names near Waialua Bay

Kawailoa extended along the shore from Waialua Bay to Waimea Bay and from the coast to the Ko‘olau Mountains. The current project area is within a small section of Kawailoa between the Anahulu and ‘Ōpae‘ula Streams where the two streams enter the sea at Waialua Bay. Only those place names found near Waialua Bay in Kawailoa Ahupua‘a are listed in Table 3.

Table 3. Places Names of Kawailoa near Waialua Bay

Place Name	*Type*	Meaning	Comments
--	*akua* [god] *stone*		“Site 232. Akua stone, Anahulu river, Waialua. A stone which formerly blocked the entrance of the Anahulu River and was side to be sacred. This stone was just beneath the water and was said to be occasionally exposed. Some years ago when it was removed . . . much anxiety was shown by the Hawaiians, for fear of evil effects.” (McAllister 1933:141)
--Loko-‘ea	*loko* (pond)	rising pond (Pukui et al. 1974)	Site 233. Loko‘ea Pond “Site 232. Akua stone, Anahulu River, Waialua” [*sic*; this is mistitled in McAllister 1933; it should be Site 233 Loko‘ea Pond]. “A small fresh-water pond covering 2.5 acres, still in use. The present pond is divided from a small stream, into which its outlets (*makaha*) open by a stone and earth embankment.

Place Name	*Type*	Meaning	Comments
			Its other sides are formed by the natural contours of the land.” (McAllister 1933:141)
--	stone		“Site 235. Stone with curative powers, near Puaena Point... a smooth, oval-shaped stone about 2 feet high and 4 feet long which represents a woman known as Puaena who came in the following of Pele from Tahiti. For its curative powers the stone was famous and Hawaiians came to visit it from all parts of Oahu.” (McAllister 1933:142).
Anahulu (Kamani)	*heiau*	*kamani* - a large tree (*Calophyllum inophyllum*) (Pukui & Elbert 1986)	“Site 231. Anahulu heiau, Kamani, at the location of the present [1933] Haleiwa Hotel. When the hotel was being built the heiau was destroyed. This, according to the Hawaiian, accounts for the failure of the hotel. According to Thrum [who called the heiau ‘Kamini’]... it was an ‘Unpaved heiau of large size with lime stone walls, of luakini class (McAllister 1933:141)
Kamani (Anahulu)	*heiau*		See Anahulu
Kawaipū‘olo	*spring*	bundle of water (McAllister 1933:141)	“Site 229. Kawaipuolo spring. . . When strangers passed here and asked for water, it was given to them in a taro-leaf cup; therefore . . .‘Bundle-of-water.’ . . . the spring suddenly disappeared at one time. After long search . . . it was discovered by the seer (*kilo*) at Makaula, near Kaena Point, on the hilltop now of the same name, Kawaipuolo. From here it was conveyed in one night by the menehunes in bundles of ti and taro leaves; hence the name, ‘The-bundled-water.’” (McAllister 1933:141)
Kepūwai	*heiau*	the sentinel's call of alarm, a trumpet call, as in war (Pukui & Elbert 1986)	“Site 228. The cemetery beside the church in Waialua marks the site of the heiau once known as Kepuwai. It has been completely destroyed [by 1933].” (McAllister 1933:141)

Place Name	*Type*	Meaning	Comments
Maeaea	point	smelly (Pukui & Elbert)	See Pua‘ena Point
Puaena Point	point	issue hot, to glow brightly (Pukui et al. 1974)	“Site 234. At the death of Elani, who was greatly beloved by his people, his body was placed on a ledge of rocks near Puaena Point, where it was allowed to decompose. The place became known as Kahakakau Kanaka. As the odor came to the sands at Haleiwa they became known as Maeaea; the pond on the other side became known as Kupava [*sic*; should be Kūpaoa in Pa‘ala‘a].” McAllister 1933:141-142.
Po‘o o Mo‘o, Wāwae o Mo‘o	stones	Head of the *mo‘o*, foot of the *mo‘o* (Pukui & Elbert)	“Site 230. Two stones known as moo [supernatural creatures], on either side of the Anahulu Stream above the old Haleiwa Seminary. One was named Poo o Moo and the other was known as Wawae o Moo. They are in no way different from ordinary stones, and can not be distinguished from other stones in the vicinity unless pointed out by one of the Hawaiians.” (McAllister 1933:141)
Pu‘upilo	*heiau*	hill [of the] swampy odor, or *pilo* [*Coprosma* spp.] plant hill (Pukui et al. 1974)	“Site 227. Puupilo heiau, seaward of the Haleiwa Courthouse, Paalaa. A slight elevation of land with an old coconut palm on the side is all that remains of this heiau.” (McAllister 1933:141)
‘Uko‘a	*loko*, fishpond		Site 236. “It is a long narrow fresh-water pond, approximately a mile in length. . . Laniwahine was the goddess (*moo*) of Ukoa and lived there with her brother Puhiula. Between the pond and the sea was a tunnel though which Laniwahine passed when she wished to bathe in the ocean. Offerings were left for her on a stone.” (McAllister 1933:142)

3.2 Mo‘olelo (Stories) and ‘Olelo (Poetical Sayings)

The district of Waialua is rich in legends, stories, proverbs, and myths. According to one tradition, Waialua means “two waters” which refers to two large stream drainages (Anahulu and Helemano-Poamoho-Kaukonahua) once used to irrigate extensive taro fields in the *ahupua‘a* of Kamananui, Pa‘ala‘a and Kawailoa, the more populous *ahupua‘a* on the eastern side of the district (Figure 8).

> Waialua is mentioned in a chant “Ke Kai O Waialua.” Oftentimes, the rhythmic sound of voices chanting in unison were compared to the rise and fall of the large waves at Waialua or to the beat of the *ka la‘au* (stick dancing) in time. The chant below “Ke Kai O Waialua” was used as a teaching exercise in the schools. (Alameida 1993:6)

Let the sea of Waialua rise,	*A ea mai ke kai o Waialua*
Let the roar echo over the hills,	*Wawa no olelo okoa i pali,*
Rumble like the grunt of the wild pig.	*Nunu me he ihu o ka pua‘a hae la*
Let the rising wave break the leaf form the cliff.	*Ako ka lau o ka nalu pii ka pali,*
Kaiaka cliff stands above the storm,	*Ku pali Kaiaka i ka ino,*
Stormy is the cape of Kukuilaania,	*ino ka lae o Kukuilauania,*
Windy indeed it is.	*He Maka-nui*
The voice of the sea rise upon the wind	*Makani me he ao la ka leo o ke kai,*
Deafening those in the uplands of Lihue,	*Kuli paia wawa ka uka a Lihue*
As it is born over the plain,	*Ome ha okaa i ke kula*
The rumbling of the sea treading upon the plain,	*Ke kula hahi a ke kai e halulu nei*
Rumbling over the Koolau.	*Halulu ma ke Koolau*
Ewa listens,	*Hoolono Ewa*
She has not seen the rising of the waves,	*Aole i ike i ka po ana a ka nalu*
And mistakes it for Wahiawa	*Kuhihewa wale no Wahiawa-e*

The pioneering Hawaiian historian Samuel Kamakau (1992:54) records a Hawaiian tradition suggesting a special origin for the people of Pa‘ala‘a: Ka‘ihikapumahana, one of the sons of the ruling chief Lonoikamakahiki “was taken to Pa‘ala‘a, Waialua, and he became the ancestor of the people there.”

Pa‘ala‘a may also refer to the land’s sanctity, evident in the number of *heiau* — especially the famous *heiau* of Kapukapuākea (Site 225) which has cross-Polynesian association with voyaging chiefs from Tahiti. Kapukapuākea is the Hawaiian cognate of the famous Tahitian *marae* (temple) of Taputapuatea at Opoa in Ra‘iatea. Presumably, Taputapuatea was the place the Opoa kings were installed. The Hawaiian tradition of Kapukapuākea held a similar function, not only in content but in the implied position between the ancient *ali‘i* (chiefs) of Hawai‘i and warrior gods of the “Oro type” (Sahlins 1992:21). Kapukapuākea and other *heiau* including Hekili Heiau (Site 223), Pu‘upilo Heiau (Site 227), Kepuwai Heiau (Site 228), Anahulu Heiau (Site 231) and Kamani Heiau (Site 231) indicate that Pa‘ala‘a Ahupua‘a was significant in pre-contact O‘ahu.

Halemano, in upland Pa‘ala‘a, is the setting for a mythical tragedy, where Halemano, the son of Wahiawa and Kūkaniloko, falls in love with Kamalālāwalu of Puna in his dreams. He goes to seek her and brings her back to O‘ahu. Kamalālāwalu refuses to go with the O‘ahu *Mō‘ī* (king)

when he sends for her, she and Halemano flee to Hawai‘i. While back in Hawai‘i, she goes to live with the king of Puna, and Halemano leaves for Kaua‘i. She follows him and they return together to live on O‘ahu. However the two *ali‘i* from Hawai‘i set out after her. They make war on O‘ahu. A terrible slaughter takes place, and at the end, Kamalālāwalu is found alive and taken by the two kings back to Hawai‘i.

The best known traditional accounts associated with Pa‘ala‘a Ahupua‘a are those associated with the cannibal chief ‘Aikanaka (lit. “cannibal”, “man-eater”). The many sources for this story (Jarves 1844: 72, *Ka Hae Hawai‘i* 1861, Kalākaua 1888:369-380, C. R. Whittemore Mar. 16, 1895, cited in Sterling and Summers 1978:109, Nakuina 1897:90, Judd 1904:179, Westervelt 1904:12, McAllister 1933:137-140, Beckwith 1940:340, Pukui 1953 in Sterling and Summers 1978:111) attest to its notoriety. The gist of the story relates that (perhaps circa A.D. 1750), a powerful wrestler and boxer, often said to have been a foreigner, retired with a few followers in the uplands of Pa‘ala‘a (called variously “Halemanu”, “Helemano” and “Halemano”), where they dined on the flesh of hapless travelers until the leader was killed by the brother of a victim. McAllister (1933:137) placed the area known as the Pā ‘Aikanaka (“Man-eater’s enclosure”) eight miles east of Hale‘iwa, but noted that nothing remained.

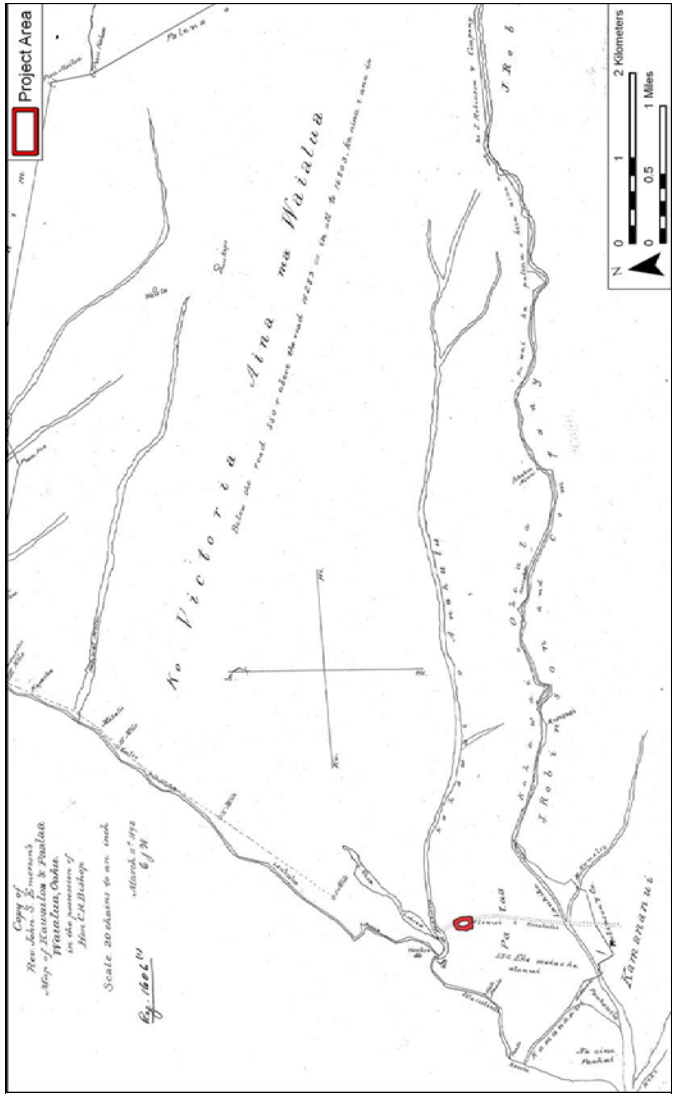

Figure 8. 1892 map of Kawailoa, Pa‘ala‘a and Kamananui in the Waialua District by John Emerson (Registered Map No. 1606, part 1, Hawai‘i Land Survey Division

Section 4 Historical Background

4.1 Pre-Contact to 1800

The history of Pa‘ala‘a Ahupua‘a must also be viewed in the wider context of the Waialua District. 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 Hawaiian Islands.

> For the 28 generations from Hulihonua [the first man in the ancient Hawaiian past] to Wākea, no man was made chief over another. During the 25 generations from Wākea 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 Waialua district’s material abundance would have made it a focus of population and *ali‘i* (chiefly) residence:

> Waialua, on its seaward slopes, was as generously endowed with water as any area on Oahu. Much of the gently sloping and level … 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 give 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 1972:465-466)

Two of the “several fishponds” of Waialua were the well-known royal ponds, ‘Uko‘a and Loko‘ea in Kawailoa Ahupua‘a.

> The presence of no less than eleven temples [heiau], several of luakini class and therefore associated with ruling chiefs, testifies to the importance of these land in the Hawaiian culture. The political importance of the district, of course, was grounded in the system of agricultural and aquacultural production, notably the extensive taro irrigation complexes of ‘Uko‘a and Loko‘ea fishponds (Kirch 1992:19).

The ponds and coast line in Waialua were also used for salt making. Thomas Thrum noted that salt-making was a money-making enterprise for land-owners, usually the *ali‘i*, and was a major item of export up to the 1880s, with a peak around 1870. He noted:

> The enterprise was carried on very much after the ancient method of earth saltpans as described by Cook and Ellis. Waialua, Oahu, had a section of several acres at Paukauila, devoted to salt making, by a hui or company of adjoining kuleana holders, on the earth pan or vat process. (Thrum 1924:116)

Waialua enters the historic record in 1794 when Ka‘eokūlani recruited the “warriors of Waialua and Wai‘anae” to make war on his nephew Kalanikūpule, then ruler of O‘ahu (Kamakau 1992:168); by December 1794 Ka‘eo had been killed and his forces were defeated.

Kalanikūpule would himself be deposed the following year when the invading Hawai‘i Island forces of Kamehameha prevailed at the Battle of Nu‘uanu in April 1795. 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 (including Pa‘ala‘a Ahupua‘a) during the first decades of the 19th century.

A picture of pre-contact Hawai’i is painted by the recorded accounts of foreign explorers. After the death of Captain James Cook on the Island of Hawai‘i in 1779, the crew of the *Resolution* continued to sail toward O‘ahu under the leadership of Captain Charles Clerke. Clerke, after anchoring in Waimea Bay, describes the highly populated and lush northwest coast of O‘ahu:

> I stood into a Bay just to the Wt[est]ward of this point the Eastern Shore of which was by far the most beautifull Country we have yet seen among these Isles, here was a fine expanse of Low Land bounteously cloath’d with Verdure, on which were situate many large Villages and extensive plantations; at the Water side it terminated in a fine sloping, sand Beach. . . . This Bay, its Geographical situation consider’d is by no means a bad Roadsted, being sheltered from the NEbN SEterly to SWbW with a good depth of Water and a fine firm sandy Bottom; it lays on the NW side of this Island of Wouahoo . . . surrounded by a fine pleasant fertile Country [Beaglehole 1967:569].

4.2 1800 to 1850

Following Kamehameha I’s conquest of O‘ahu in 1795, he traveled around the island of O‘ahu to encourage people to rebuild their war-ravaged agricultural fields and fishponds by his own example. In 1806:

> Kamehameha stayed for only one day to farm at Wai‘anae, then went to Waialua. He stayed at least 3 or 4 days with the chiefs and people of Waialua working in the *lo‘i* [irrigated fields] which extended from the famous *pawehe* (geometric patterns) mats [of Mokulē‘ia] to the waters of Waimea. From Waialua he went to Laie and farmed there [*Ka Nai Aupini,* newspaper article, cited in Alameida 1993:39].

Kamehameha not only encouraged his people to rebuild areas devastated by the wars, but also to expand into new areas. “He cleared the land at Waikiki, Honolulu, Kapalama, Kapa‘auki, Keone‘ula, Kapa‘eli, and all the other places, and when all the lands were under cultivation he cultivated *mauka* in Nu‘uanu as far as Keawewawapu‘ahanui” (Kamakau 1992:192). This passage indicates that there may have been an intensification of agriculture after 1804, which included expanding the irrigation system into new lands upland (*mauka*) of the former pre-Contact fields (Sahlins 1992:52).

The Hawaiian Islands began exporting sandalwood to the Orient shortly after 1800 and the commerce flourished until the supply dwindled in the mid-1830s. 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 Kauai and from the districts of Waimea and Wai‘anae on O‘ahu (Kuykendall 1965:88). Peter Corney, the chief officer of the Columbia, describes the prodigious operations involved in the trade:

> Next day we sailed for Whymea [Waimea] by [Bay], on the west end of the island, to get another cargo of wood. In our passage we touched at Wyeni [Wai‘anae], and took on board some wood and hogs. We lay here for a few days, and then sailed along the shore for Whymea...where we took on board a full cargo of wood in thirty-six hours — more than 200 canoes employed in bringing it off, day and night. (Corney 1896:89-90)

After Kamehameha’s death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the trade, resulting in an unrestrained demand on stocks of the wood and upon the energies of the *maka‘āinana* (commoners) who did the harvesting. Already in October 1817, a Russian visitor on O‘ahu noted: “There are now many fields left uncultivated, since the natives are obliged to be cutting sandalwood” (Barratt 1988:218).

“Traders records from Kamehameha’s last years show several important *ali‘i* trafficking in sandalwood on their own, including...Kalaimoku, Cox, Boki, Ka‘ahumanu, and some others” (Sahlins 1992:59). Among these *ali‘i*, Ke‘eaumoku Cox was the Hawai‘i Island chief who had been given control of Waialua by Kamehameha. Diaries and journals of western entrepreneurs on O‘ahu record the early 19th-century sandalwood-based trade that intruded upon the established mores and customs of the Waialua population.

Between 1830 and 1850, the demands of the *ali‘i* on the *maka‘āinana* (common people) were severe. The missionary, John Emerson, commenting on the burdensome taxes on the people, wrote that the ruling chiefs “get hungry often and send a vessel to Waialua for food quite as often as it is welcomed by the people” (MsL: 10 Feb 1834, cited in Sahlins 1992:145). The chiefs also demanded food brought to them:

> Last Sat some 2 or 300 men went from this place to H[onolulu] to carry food for the chiefs and this [is] often done. . . .Each man carried enough food to maintain 4 persons one week & will cost each man beside the time spent in [indecipherable] and cooking it 4 days time and 70 miles travel to get it to H[onolulu], and yet each man‘s load would only bring 50 cts. (Locke, journal, 26 June 1837; cf. MsL: Emerson, 11 Jan 1835, cited in Sahlins 1992:145)

In 1813, Waialua was described by John Whitman, an early missionary visitor as “a large district on the N.E. extremity of the island, embracing a large quantity of taro land, many excellent fishing grounds and several large fish ponds one of which deserves particular notice for its size and the labour bestowed in building the wall which encloses it” (Holt 1979:78).

Two other visiting missionaries, Rev. Daniel Tyerman and George Bennett, Esq. of the London Mission Society, left an account of coastal Pa‘ala‘a from their visit on May 16, 1822 which focused on the Pōhaku Lanai rock anomaly at Kaiaka Bay:

> Continuing our circuminsular tour we crossed a spacious plain, on the coast, of which the base was coral and the soil a thin layer of vegetable mould. On this level stands a mound, which might be taken for an artificial monument, consisting of two prodigious masses of coral-rock, the lower about six feet above the surface

> of the ground, but evidently imbeded in the stratum below; the upper, laid flat upon this, and overspreading it on every side, measured ninety-three feet in compass, and eight, at least, in the thickest part, the shape being conical. The whole pile reached nearly five yards in height, and when we consider that the substance must have been wrought under water, it is almost a necessary conclusion that the sea has considerably retired from this coast from twenty-five to thirty feet in depth...It was recently a marae, to which the kings and chiefs repaired to consult Tani, who was worshiped at it, on questions of peace and war, and to pray that in battle their bodies might be rendered invulnerable to the spears of their enemies. (Tyerman and Bennett 1831:455)

During the same decades that commercial ventures were forcing changes upon the Hawaiian landscape, western missionary interests were establishing their foothold in the islands. The 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 23 aboard the bird “Thaddeus.” By the 1820s, the Protestant missionaries had established close links with the *ali‘i.*

One of these second company of missionaries, Levi Chamberlain, traveled around the islands visiting local schools set up to teach writing and religious instruction to the Hawaiians. He described the Waialua area in 1826:

> At 11 o’ck we set out and walked along a path leading over an extended plain covered with high grass. After walking about 3 miles we took a path leading over a marshy tract to the mountains which we were designing to cross in order that we might avoid a bad piece of traveling along the western shore. The mountains here run in nearly a N.W. and N.E. direction being somewhat circular. We ascended by a rough & difficult path, shrubs, long grass, wild plants and bushes sprung up grew luxuriantly among the rocks being plentifully moistened by little streams which trickled down the steep sides of the mountains. After ascending several hundred feet, we came to a beautiful little run of water conducted by sprouts [*sic*] furnishing sufficient moisture for a number of taro patches below. I was told that the water never failed and the district into which it passes is called Kawaihapai (Water lifted Up) on account of the water’s being conducted from such an elevation.
>
> The prospect from the acclivity is very fine. The whole district of Waialua is spread out before the eye with its cluster of settlements, straggling houses, scattering trees, cultivated plats & growing in broad perspectives the wide extending ocean tossing its restless waves and throwing in its white foaming billows fringing the shores all along the whole extent of the district [Chamberlain 1823-1827, cited in Alameida 1993:14].

From July to August 1826, Ka‘ahumanu and an entourage consisting of up to 300 persons conducted a proselytizing tour around O‘ahu. Rev. Hiram Bingham’s account of the proceedings at Waialua suggests the extent of the missionary’s inroads in the district:

> A very large concourse of people assembled on the Lord's Day, for public worship in the open air. To the listening throngs I endeavored to proclaim the great salvation...
>
> 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 Laanui, to whom the district belonged. There were found under Maiao and his assistant teachers, four hundred and ninety-five male and female pupils, and under Kaoo, one hundred and sixty-four, amounting together to six hundred and fifty-nine pupils, chiefly men and women. (Bingham 1847:295-296)

Lydia Pi‘ia Nāmāhana, sister of Ka‘ahumanu, retained control of Pa‘ala‘a and the Waialua District by 1827. The previous year, she was already involved in the Waialua sandalwood trade. Stephen Reynolds' journal entry of October 24, 1826 noted: "Convoy sailed for Wairua — to get 400 piculs of wood from Piia [Nāmāhana] — Due from Cox's estate" (King 1989:155).

Nāmāhana's husband, Gideon La‘anui, the grand-nephew of Kamehameha I, had been born on Hawai‘i Island and grew up in the train of Kamehameha. La‘anui himself, in his "Reminiscences of Gideon Laanui" published in 1838, described his origins:

> Kamehameha battled against Namakeha, in which the latter was killed, thus ending the war, with Kamehameha victorious [1794]. Then was I born, Hilo being the birthplace, and from birth till the readiness of the peleleu [canoe] fleet when Kamehameha sailed for Maui. I was five years old on leaving Hawaii with the peleleu for Maui, and lived there [presumably at Lahaina]. While yet a child, though somewhat grown, we moved to Wailuku where was also the king. On going to Lahaina, food was distributed to men and women, consisting of wailau (bundled hard poi). We were one year at that place. Then the king came to Oahu on a foreign ship. Brown was the name of its captain. We followed on the peleleu, my parents and I, and landed at Waikiki. (La‘anui 1929:86)

Elizabeth Pratt, La‘anui's daughter (by his second wife, Teresa Owana), records that it was Kamehameha himself who arranged La‘anui's marriage to Nāmāhana:

> Among the visitors to the royal court was Kekuwai-Piia [Nāmāhana], who had just become a widow, coming as a guest of her sister, Queen Kaahumanu. Laanui was a boy growing to maturity. The king had not forgotten the great wish of his heart, coveting possession of Waimea and hoping to gain it, if not in battle, through a matrimonial alliance...[Now] he chose a new agent of his ambition by inviting Laanui to the court. The invitation was gladly accepted and the visit lasted for months. Kamehameha was loath to have Laanui depart while he was still slyly intriguing with Kaahumanu to negotiate a marriage between Piia and Laanui. Piia is described as being a person heavily built and not prepossessing in appearance like her sisters Kaahumanu and Kaheiheimalie. When at last the proposition was put squarely to Laanui, that it was the united wish of the king and queen that the marriage should take place, for a moment he was dejected. To wed a woman very many years his senior was not the desire of his heart. Yet realizing

> that it might be perilous to go contrary to the express desire of the powerful monarch he quietly consented "to take the bitter pill." (Pratt 1920:46)

La‘anui's own words (given in testimony to the mid-nineteenth century Land Commission) reveals how he and his wife came to reside at Waialua and tells of his land interests in Pa‘ala‘a:

> My wife Kuaipua [Lydia Nāmāhana Kekuaipi‘ia] is the foundation [*kumu*] of my claim here at Waialua, and I have truly become a *kama‘āina* here, like the native children of the place [*a lilo maoli i kamaaina no o nei, me ke keiki papa la*]. After I had been living at Waialua for a little while with Kekuaipiia, the *‘ili* of ‘Uko‘a became hers — that is at Kamananui — along with Kalopa [Kalaopa], the two of them. Ka‘ahumanu asked Ke‘eaumoku [Cox] for Lokoea and he consented it be given to Piia and she gave me [*a haawi a Piia ia‘u*] Ukoa, Lokoea and Kalopa in [the *ahupua‘a* of] Kamananui. When Ke‘eaumoku died in 1824, Ka‘ahumanu gave Piia Waialua, from one point to the other, just for her support ["food", *kona ai io nae*], and Kawailoa from the sea inland to the mountain and one side to the other, excepting the *kus* [*‘ili kūpono*]. Piia then said to me: Your land is Kawailoa, from upland to the sea and one side to the other, I retain no *ku* within it; I give it to you, together with the two *‘ili* at Paalaa and the six *‘ili* at Kamananui. ‘Uko‘a and Lokoea are to be joined with the *ahupua‘a* of Kawailoa. This Piia spoke to me. (cited in Sahlins 1992:95)

La‘anui was living at Kawailoa, adjacent to Pa‘ala‘a, in 1832 (Nāmāhana had died in 1829) when the Rev. John S. Emerson, (1800-1867), a member of the fifth missionary party, and his wife Ursula, arrived at Waialua Bay to establish a mission station in the Waialua district; Emerson reported in a letter:

> The wind was against us as we entered the harbor at Waialua, and we were obliged to "beat in." As soon as we approached the land, La‘anui, our chief, came alongside in a canoe to welcome us, presenting us with a good watermelon, of which we ate freely and were at once relieved of our seasickness. (Emerson 1928:55)

Emerson's son, Oliver Pomeroy Emerson, recounts an episode revealing the authority La‘anui possessed within Waialua:

> The new [meeting] house [at Waialua] was opened for the first time for dedication and public worship 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 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‘anui had issued positive commands that everyone in the entire district of Waialua should attend this service under threat of severe penalty...When La‘anui 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 La‘anui that he should not force the people to attend church in that way... (Emerson 1928:88-89)

This chief, an early Christian convert, had established a church in Kawailoa as early as 1830. Although it could seat 1200 people, Emerson felt it was inadequate, and a new church was built near La‘anui housesite near the coast. This was a simple grass hut near the shore in the area, north of the current project area, now occupied by Hale‘iwa Joe’s restaurant. When the first church burned, a second grass house was built in the same location. A new location for the church was selected in 1840-41, on a lot adjacent and east of the current project area. It was this same lot that was once the location of Kepuwai Heiau (McAllister 1933:141). An adobe church was built in the area now used as a cemetery (Figure 9). In 1890, a new wooden church was built on the same lot, but moved north of the cemetery. Queen Lili‘uokalani had a summer home near Loko‘ea Pond in Kawailoa, and she attended services at this church during her stay. Locals began the call the church “The Queen’s Church,” and the title was officially changed to the Lili‘uokalani Church in 1975 in her honor. This wooden church was replaced by the fifth and current cinder block church in 1961 at the same site as the previous building (Figure 10). The cemetery was established next to the third church; John Emerson, his wife, Ursula, and three of their children are buried there (Jacobs 2006:45-47). Emerson also built a home, called Waipuolu, near the mouth of the Anahulu River, north of the project area (Sahlins 1992:155). Converts wishing to become teachers soon moved near the mission, forming a small settlement that would later become the town of Hale‘iwa.

In 1832, the missionary, Ephraim Walter Clark, reported that: “Waialua on the eastern part of the island is a populous region. A mission can be located at a central point in this vicinity, [and] by preaching at different places that are within 5 or 6 miles of each other & of easy access, [we] would probably have 3,000 or 4,000 bearers [followers] (Letter from E. W. Clark 1932, cited in Alameida 1993:4).

It is possible to estimate the population comprising “everyone in the entire district of Waialua” in 1833. Censuses taken by Protestant missionaries in the Hawaiian Islands beginning in 1831 provide the earliest documentation of the size of the native population after the first decades of western contact. In 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). Much of this decline was due to a high death rate from newly introduced diseases, such as smallpox, typhus, and venereal diseases. In 1850, the missionary Emerson wrote:

> I went to Kawaihapai, distant about 6 miles to preach to a small congregation. Found many sick on the road calling for medicine; & when [I] arrived at the place of meeting I found two unburned corpses, but a few steps from the schoolhouse & other sick-apparently nigh unto death. . . . The past epidemic has been of a very strange character. Many were taken with violent pains in the head or stomach, which would soon spread over the whole system; & some times in one or two

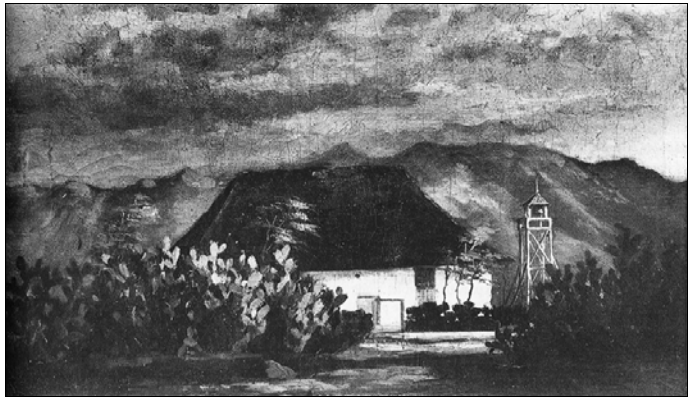

Figure 9. Waialua Church, the third church built of adobe in 1840 in area now marked as a cemetery adjacent to the Lili‘uokalani Church, east and adjacent to the current project area (oil painting by Charles Furneaux 1880s)

Figure 10. Lili‘uokalani Church, the fifth and present Waialua church built in 1961, in lot east and adjacent to the current project area (wikimedia commons)

> days the patient would die, but more frequently he would linger along six or ten days. (Emerson 1850, cited in Alameida 1993:84; Letter, Emerson to Anderson. May 22, 1850. Hawaiian Mission Children’s Society Library)

The adult to child ratio in 1831-32 was three to one (Schmitt 1973:9). This is not only a reflection of the low birth rate during these years, but also indicates that many young people were moving out of the district. They left to escape the increasing demands of the *ali‘i* during the Sandalwood Period and to seek a better life in the new urban centers of the islands. This trend in population decline continued until 1866, when the population reached a low of 851 persons (Schmidt 1977: 13-14).

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 victual 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. (Sahlins 1992:145)

4.3 Māhele Documentation

From about 1837, Ka‘ahumanu’s brother Kahekili Ke‘eaumoku, also known as George Cox, became the *ali‘i ‘ai moku* (governing high chief) of Waialua. In 1824, Kahekili Ke‘eaumoku died and his sister, Lydia Kekuapi‘ia Nāmāhana, also known as Pi‘ia, inherited the entire *moku* (district) of Waialua. When she died, her husband La‘anui was confirmed as the *luna* (landlord or supervisor) by Ka‘ahumanu, who was again considered the owner. Ka‘ahumanu, who died in 1832, willed all of her lands to her niece, Kīna‘u. After Kīna‘u’s death in 1839, the *kalana* (land division smaller than a *moku*) within Waialua was inherited by her daughter, Victoria Kamāmalu, along with many other lands in the islands (Kame‘eleihiwa 1992:106, 120-124).

Toward the mid-19th century, the Organic Acts of 1845 and 1846 initiated the process of the Māhele (the division of Hawaiian lands), which introduced private property into Hawaiian society. In 1848 the crown, the Hawaiian government, and the *ali‘i* (royalty) received their land titles. Originally the entire district of Waialua was awarded to Victoria Kamāmalu, sister of Alexander Liholiho (King Kamehameha IV) and Lot Kamehameha (King Kamehameha V). She ceded the lands from Kamananui to Ka‘ena (the western section of Waialua), which became government lands, but she kept the *ahupua‘a* of Pa‘ala‘a and Kawailoa (Land Commission Award 7713, *‘Āpana* 34). Within these two *ahupua‘a,* 134 Hawaiians received land and at least 24 people claimed lands that were not awarded (Sahlins 1992:167). Most of these lands were

located along the lower river valleys and at the wetlands near the coast. The most productive taro land was near the coast in an area called Kawailoa Kai and Pa‘ala‘a Kai. This irrigated agricultural area was divided between these two *ahupua‘a*. As previously noted, the area around the project area until the late nineteenth century was a part of Kawailoa Kai, but is also often labeled on maps as part of Pa‘ala‘a Kai.

Kuleana awards for individual parcels within the *ahupua‘a* of Pa‘ala‘a and Kawailoa were subsequently granted in 1850. These Land Commission Awards (LCAs) were presented to tenants — native Hawaiians, naturalized foreigners, non-Hawaiians born in the islands, or long-term resident foreigners — who could prove occupancy on the parcels before 1845. Of the *kuleana* claims made in Waialua District only “the people of Kawailoa and Pa‘ala‘a saw through their claims before the Commission” (Sahlins 1992:18). There were 77 claims made for Pa‘ala‘a; 64 of these were awarded. There were 100 claims in Kawailoa, of which 85 were awarded. Some of these awards overlap, as the claimants had lots both in Pa‘ala‘a and Kawailoa. Locations of the Pa‘ala‘a-Kawailoa Land Commission Awards (LCAs) near the coast are shown on two historic maps, one from 1883 (Figure 7) and one from 1900 (Figure 11).

As the historic maps indicate, the Kawailoa-Pa‘ala‘a *kuleana* parcels form a broad cluster around the present project area. The boundary of the Pa‘ala‘a and Kawailoa *kuleana*, based on the Māhele testimony, has been added to this map (boundary line as shown in Sahlins 1992:147). This figure also shows the relationship of the project area to the John Emerson’s home and mission (to the northeast), the early twentieth century Hale‘iwa Hotel (to the north) and the Waialua Mission Church (now called the Lili‘uokalani Church) and cemetery to the east.

Table 4 presents information on five Kawailoa awards near the coast, directly adjacent to the west side of the project area. Four of these awards consists of lands with two to four *‘āpana* (lots), with two to six taro *lo‘i* (irrigated patches) and one to two houselots. Three of the awards mention a communal sweet potato patch, which they have rights to cultivate, but which is on land that they do not directly claim. Two of the claims mention fishing rights: Gideon La‘anui (LCA 9951), the *konohiki* (land manager) of Waialua; and, Kahakai, who was awarded the rights to fish *‘o‘opu* (gobies), *‘ōpae* (freshwater shrimp), *limu kala* (surgeonfish), and *‘anae* (mullet). There are also small claims to *mala* (gardens) and gourds, *pali* (upland areas near a cliff) lands for *wauke* (paper mulberry), *kula* lands for pasture, and *loko ‘ai* (fishponds) used for both taro and fish.

Following the death of Victoria Kamāmalu in 1866, Pa‘ala‘a and Kawailoa Ahupua‘a, along with her many other land holdings, were 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 Kekūnao‘a’s son Lot Kapuāiwa, who by that time reigned as Kamehameha V...Kapuāiwa died intestate in 1872, whereupon Ruth Ke‘elikōlani, Kapuāiwa’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].

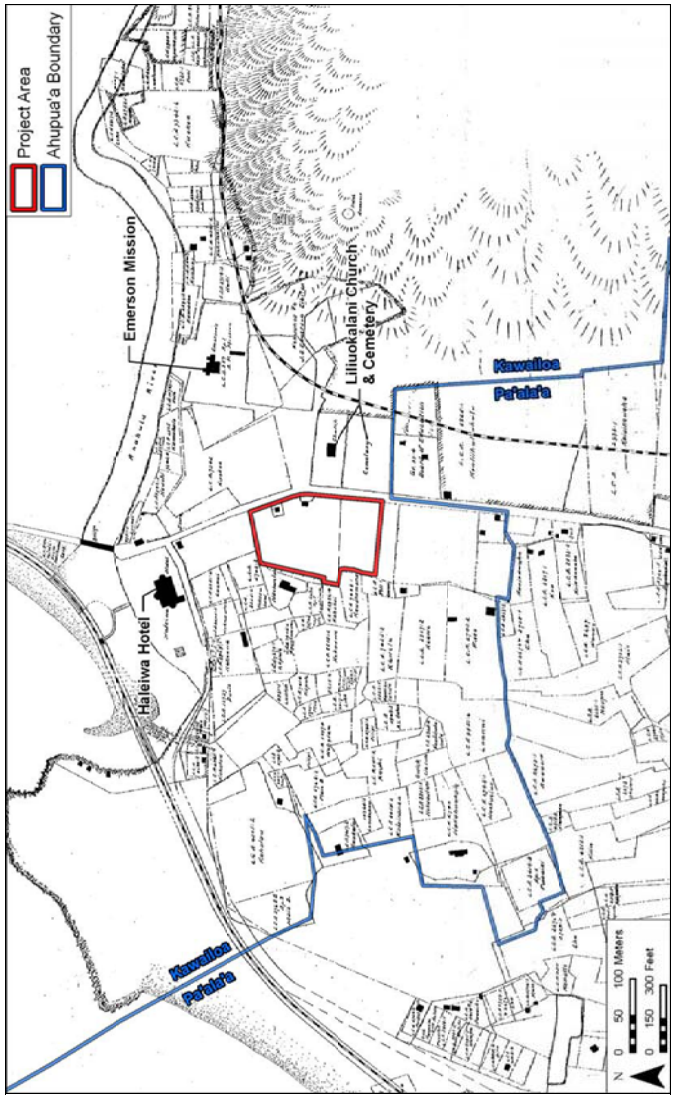

Figure 11. 1900 Waialua Agricultural Company Map of Lands at Pa'ala'a by W.A. Wall, showing Land Commission Awards in the vicinity of present Project Area (Registered Map No. 2055, Hawai'i Land Survey Division)

Table 4. Land Commission Awards in Kawailoa Adjacent to the Project Area

Claim #	Claimant	'Ili	Land Use	Amount
2692	Luahiwa	Anahulu, Kawailoa	Claim to sweet potatoes on communal lot	4 *'āpana*; 1.18 ac.
2748	Naahelua	Kawailoa	12 *lo'i* & watercourse, *kula*, claim for sweet potatoes in communal lot, houselot at Puaena	4 *'āpana*; 6.26 ac.
2907	Keawe		9 *lo'i* by a watercourse, one houselot, 1 *pali wauke*	6 *'āpana*; 3.4 ac
2926	Kahakai	Kawailoa	5 *lo'i,* 1 *kula*, *loko 'ai* (pond) for taro and fish, 1 houslot, claim to sweet potatoes in communal lot, 1 *wauke pali*, one *mala* (garden) for gourd, one *mala* for sweet potatoes, fishing rights to *'o'opu* (gobies), *'opae* (freshwater shrimp), *limu kala* (surgeonfish), and *'anae* (mullet) at certain times of the year	4 *'āpana*; 3.15.
7408	Kawahamana	Kawailoa	2 *lo'i* near a watercourse, 1 houselot	2 *'āpana*; 0.78 ac.
9951	La'anui, Gideon	Kalaopa, Kalehunui, Kamahu, Kuanopili, Laukīha'a & Waikaalulu	7 *lo'i*, 2 houselots, fishing rights for Kalaopa & Kalehunui 'Ili	8 *'āpana*; 8.0 ac.

4.4 1850s to 1900

In 1850, the first road from Honolulu to Waialua was built.

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 focused primarily on supplying whale ships during their long layovers in the islands. With the dwindling of ship arrivals during the 1860s, the populaces of districts like Waialua which had been dependent on the victualing trade migrated to Honolulu and other parts of O‘ahu.

The diaries of Robert C. Perkins, an entomologist and ornithologist, who collected specimens in the Waialua District in 1892-1893, reveal aspects of life in the area 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 there after fulfilling their contracts with the sugar plantations that had brought them to the Hawaiian Island (the first 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, 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...
>
> 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. (Coulter and Chun 1937: 11)

By 1892 there were 180 acres under cultivation of rice in the Waialua District (Coulter and Chun, 1937: 21). A map of rice farming areas of O‘ahu in 1892 shows the Waialua rice fields extended from Kamananui Ahupua‘a, across Pa‘ala‘a Ahupua‘a, to Kawailoa Ahupua‘a (Coulter and Chun, 1937:12). The map indicates that the present study area was probably part of the Pa‘ala‘a rice fields.

Cattle grazed on the lowlands in Waialua as early as the 1840s (Sahlins 1992:148). Gideon La‘anui had amassed a herd of 100 cattle by the year of his death in 1849. Other chiefs also had small herds, and the Protestant mission had at least 250. The main depredations to the gardens of the native Hawaiians, however, were caused by the cattle ranches established in the uplands of Pa‘ala‘a and Kawailoa on land leased by the ali‘i to foreigners, especially Robinson and Co.,

who leased the Halemano lands of upper Pa‘ala‘a and Louis Gravier, who leased the Paukauila lands of Pa‘ala‘a. The cattle not only ranged over the upper pasture land, but also ran into and over the lowland sweet potato fields and the coastal wetland taro patches. Many fences and walls were built during this period to a keep the cattle out, but the Hawaiians had little recourse for the damages caused by these animals (Sahlins 1992:148-149).

In 1865, the missionary Rev. Orramel H. Gulick established the Waialua Female Seminary, when he moved to Waialua to help his co-missionary John Emerson. His son, Oliver Emerson, describes this institution, and also provides some information on the origin of the name Hale‘iwa:

> My mother was especially interested in the Waialua Boarding School for native girls, which was opened in 1865 in the Gulick home and carried on by our lifelong friends, Mr. and Mrs. Orramel Gulick, until 1870. The school was called by the natives Hale Iwa, and in the spring of 1871, Miss Mary Green took charge. Her knowledge of Hawaiian character and her devotion to the native people is well known, and who proved a rare companion, finding in turn in my mother a wise and sympathetic counselor and friend. (Emerson 1928:227)

Hale‘iwa was the name of the dormitory building for the young girls attending the seminary. The seminary was discontinued after the death of Mrs. Green in 1882 (Thrum 1920:46). The name translates as “home of the frigate bird (‘*iwa*), but Clark (2002:88) explains that “as the ‘*iwa* is a poetic symbol for an attractive person, so the figurative meaning of the name is “home of attractive people.”

In addition to agricultural changes, western entrepreneurial interests would also alter the Pa‘ala‘a landscape. The Oahu Railway and Land (O.R. &L.) Company, organized by Benjamin Dillingham in 1889, connected outlying areas of O‘ahu to Honolulu. During the last decade of the 19th 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).

Capitalizing on the increasing numbers of visitors to the north shore of O‘ahu who journeyed on his railroad, Dillingham opened the two-story Haleiwa Hotel at Waialua Bay in Pa‘ala‘a Ahupua‘a, in 1899. The hotel was built at a cost of more than $50,000 on land leased from the Bernice Pauahi Bishop Estate. The hotel’s name, Hale‘iwa, first used for the dormitory of the Waialua Female Seminary dormitory, was adopted for the hotel, and the name eventually was used to identify the entire area above the bay and the “town” there, which t that time comprised only the hotel, a church, and a courthouse. Eventually the area became the town of Hale‘iwa.

The development of a railroad system also spurred the development of large-scale sugar farming in Waialua. Sugarcane had been first cultivated at Waialua earlier in the century by the missionary John Emerson who grew sugar cane one his land as early as 1836. He “made his own molasses, grinding a few bundles of cane in a little wooden mill turned by oxen, and boiling down the juice in an old whaler trypot (*The Friend*, cited in Condé and Best 1973:34). This sugar cane plantation later passed through several hands, including the Levi and Warren Chamberlain Sugar Company, established 1865, Halstead & Gordon, and the Halstead Brothers.

In 1898, the Halstead Brothers had a small sugar cane plantation and mill at Waialua town. In this same year, the Oahu Railway and Land Company extended their railroad to Waialua, and

built a station in Kawaihāpai. B. F. Dillingham believed that the Halstead brother's land could be turned into a profitable sugar plantation, especially since there was now a rail line to Honolulu. The Waialua Agricultural Company was established in this same year by J. B. Atherton, E. D. Tenney, B. F. Dillingham, W. A. Bowen, H. Waterhouse and M. R. Robinson (Moblo 1991:4), and was incorporated by the company Castle & Cooke (Dorrance and Morgan 2000:47). They bought the Halstead Brother's land and mill and began to buy or lease the adjacent lands, many owned by native Hawaiians. They acquired many of the former irrigated taro lands in order to control the water rights of the region.

Ditches to control water flow began to be built around 1902 in Waialua. The Ito Ditch, built after 1911, diverted water to the Mokulē‘ia sugar cane fields. The Waialua Agricultural Company was famous for its system of flume irrigation. The portable concrete flumes were set around the fields in a herringbone pattern and water was released to the field by small tin gates (Wilcox 1996:110).

Land for a new railroad that would carry cane from the fields to the mill began to be surveyed in 1898, and by 1908 the new railroad connected the plantation lands in Waialua, Helemano, and Kawailoa. In 1910, it was reported in the *Louisiana Planter*:

> Waialua is reached either by railroad, a distance from Honolulu of 58 miles, or wagon road, 28 miles. The plantation lands extend along the seacoast 15 miles and 10 miles back toward the mountains. The plantation has a good railway system. (cited in Condé and Best 1973:341)

4.5 1900 to Present

Waialua Agricultural Company (later named Waialua Sugar Company) continued to expand during the first decades of the 20th century, eventually reaching more than 12,000 acres, including portions of Pa‘ala‘a Ahupua‘a which were leased from the Bernice Pauahi 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).

Into the 20th century, rice continued to be cultivated in Pa‘ala‘a, the Waialua District, and other areas within the Hawaiian Islands. The marked-off fields west of the project area, shown on a 1919 U.S. War Department map (Figure 12), are probably abandoned rice fields, constructed in the former taro land area where Pa‘ala‘a and Kawailoa Hawaiians once planted their taro. However:

> Rice farming went into a steady decline for several decades before phasing out almost completely just before the beginning of World War II. In 1921, Hawai‘i exported seven hundred thousand pounds of rice as compared to the ten million pounds produced at its height in 1890. In 1929 there were only twenty-five hundred acres of rice grown in Hawai‘i by less than seven hundred laborers, nearly five thousand laborers less than in 1903 when there were 5,643 rice planters. (Chong 1998:53)

Figure 12. 1919 U.S. War Department map, Waialua Quadrangle, showing the project area; note demarcated fields to the west, probably abandoned rice fields

By the early twentieth century, the main government road has been paved and improved. The 1919 map also shows other, unimproved (dirt, gravel, or macadamized) roads crossing the main road, which would become Kamehameha Highway and Kaukonahua Road. There are seven small houses in the project area aligned with this road, and additional five houses in the center of the lot. The beautiful bridge north of the project area, over the Anahulu River, now called “the Rainbow Bridge” was completed in 1921 (Jacobs 2006:53).

Beginning in the late 1920s, portions of Kawailoa were developed for military operations as the United States expanded its armed presence in the Hawaiian Islands. What would subsequently evolve into the Haleiwa Auxiliary Airfield began as a gunnery range in 1928. By November 1941, military facilities consisted of a small tent city, and the airstrip was a more like a country road than a regular runway. During the Japanese attack on December 7th, 1941, two pilots took off from Hale‘iwa Field and succeeded in shooting down two Japanese planes.

Following the United States’ entrance into World War II, Hale‘iwa and the surrounding area was subjected to major infrastructure improvements associated with military activity. A major runway was constructed from Pua‘ena Point, northeast of the project area, extending to the present-day Kawailoa Drive (Figure 13). Military records indicate the construction of bunkers, housing and storage building, 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.

The Hale‘iwa Hotel (Figure 14) continued to operate in the first decades of the twentieth century. It closed in 1928, but reopened in 1931 as the Hale‘iwa Beach Club. It was taken over by the U.S. Army in the 1930s, serving as a center for recreational activities by military personnel in Hale‘iwa during World War II. The hotel was torn down in 1952 (Hibbard 2006:38). The O.R. & L. railway continued to operate during the war to transport military equipment and other goods, but ceased operations in 1947, when shipping by truck became more economically feasible.

A 1929 U.S.G.S. map (Figure 15) depicts this increasing habitation and infrastructure density. There is a solid row of houses adjacent to Kamehameha Highway within the project area. Improved side streets lead to other housing clusters, especially near the beach. The former taro land area west of the project area is still marked as small fields; it was probably too swampy at this stage to develop for housing. The map depicts a golf course along the beach west of the project area, in the area which is later developed for the Ali‘i Beach Park. The Waialua Golf Club was associated with the Hale‘iwa Hotel, as noted in this 1915 travel guide that lists the interesting sites of the area.

> Haleiwa Hotel is at Waialua, 56 miles from Honolulu by rail. It takes over two hours to reach it. This attractive hotel is popular as a weekend outing place, with golf links, tennis, boating and sea-bathing at hand. . . . The next morning at 9 a carriage takes one to the Waialua Sugar Mill . . . Five miles from the hotel along the main road are two heiaus, or Hawaiian temples, which may be inspected if one is interested. They are in ruins, the stonewalls [*sic*] being still there. Hotel rates: American plan $3 per day. (Schnack 1915:1350)

Figure 13. 1943 aerial photograph (Hawaii Aviation), depicting Hale‘iwa Airfield runway at Pua‘ena Point (upper right of photograph), northeast of the current project area

Figure 14. Hale‘iwa Hotel, early twentieth century, University of Hawai‘i at Mānoa Digital Collection

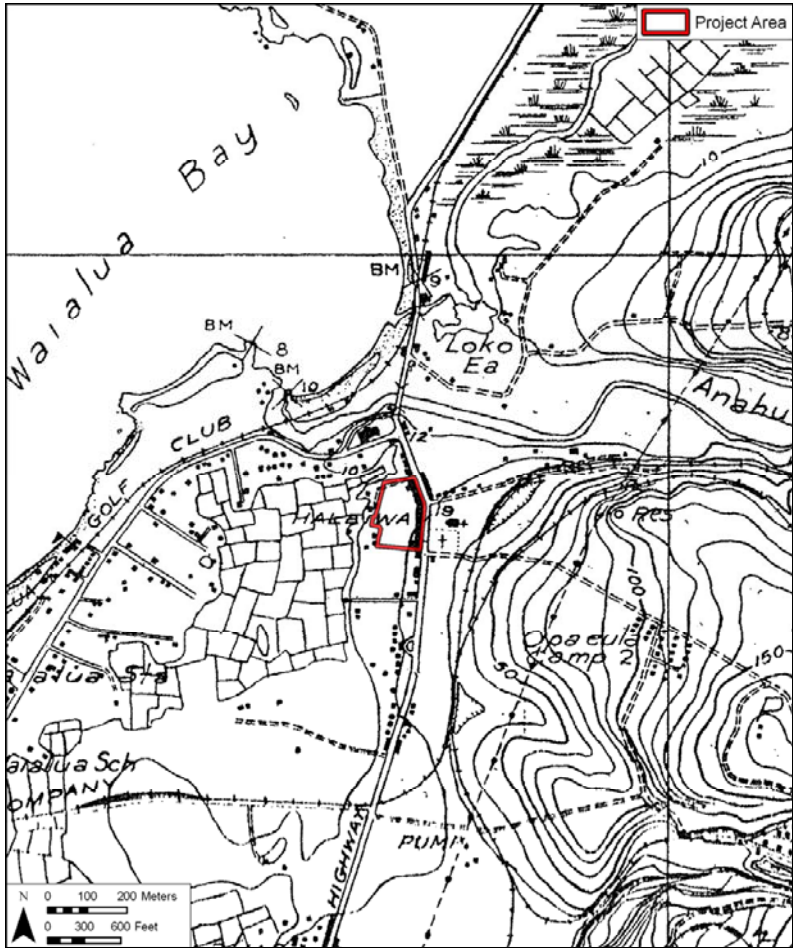

Figure 15. 1929 U.S. Geological Survey map, Haleiwa Quadrangle, showing the project area; note: rectangular taro/rice fields west (*makai*) of project area

The 1929 map also shows one of the camps (Opaeula Camp 2) in the inland section of Waialua set up by the Waialua Agricultural Company for their sugar field workers. Unimproved roads and railroad tracks lead to these camps and to the upland sugar cane fields. By 1943 (Figure 16), the area is a maze of railroad tracks, irrigation ditches, pumps, reservoirs, camps, and other facilities constructed by the Waialua Sugar Company. Schools and fire stations were built near the Waialua Mill, and the working population moved away from the Hale‘iwa area to Waialua town near the mill. This may be why there is only one house shown within the current project area at this time, as opposed to the twelve shown in 1919. At this time, the Haleiwa Hotel and the associated golf course were utilized by the U.S. military.

On a 1953 map (Figure 17), the beginning of the draining of the former taro lands is depicted, as a reservoir with a pipeline is shown to the west of the project area. By this time, the Haleiwa Hotel had been torn down. Ten structures are shown within the current project area.

The Hale‘iwa Small Boat Harbor was completed in 1966 (Souza et al. 2003:17). The navigation features of the completed harbor consisted of an entrance channel 740 feet long, 100 to 120 feet wide, and 12 feet deep; a revetted mole 1,310 feet long; a stub breakwater 80 feet long; and a wave absorber 140 feet long. This harbor can be seen on a 1978 aerial photograph (Figure 18), north of the project area. On the 1953 map and the 1978 photograph, the density of housing complexes has increased along the coast and Kamehameha Highway, but still avoids the former swampy taro lands. On the 1998 U.S.G. S. map (see Figure 1), housing encroaches into the edges of this area, but it is considered a flood zone, and thus is still not developed.

Waialua Sugar Company was the last sugar company to survive on O‘ahu. The influx of workers into the region caused significant population increase in the area. Before the initiation of large-scale sugar cultivation, the population in 1896 was 1,349 persons. By 1900, this had jumped to 3,285 persons, with an increase to 6,083 in 1910, to 8,397 in 1940, and to 9,171 in 1970 (Schmitt 1977:13-14). In 1985, Castle & Cooke merged with the FlexiVan Corp. to become the Dole Food Company. In 1991, Dole Food Company’s subsidiary, Waialua Sugar Co., produced 8% of the sugar in Hawai‘i, but in the next few years the plantation became unprofitable. In 1996, the plantation was shut down by the Dole Food Company (Dorrance and Morgan 2000:142).

Today, Hale‘iwa Town boasts a small community and is a prime destination for tourists and surfers from all over the world. Single-family home and small businesses line the street along Kamehameha Highway, adjacent to the project area. Hale‘iwa Ali‘i Beach Park, in the area formerly used as a golf course, was developed in 1969 after the land had been transferred from the Bernice Pauahi Bishop Estate to the City and County of Honolulu. In 1984, the City and County of Honolulu established the Hale‘iwa Historic, Scenic, and Cultural District, mandating preservation rules and new construction constraints for Hale‘iwa Town.

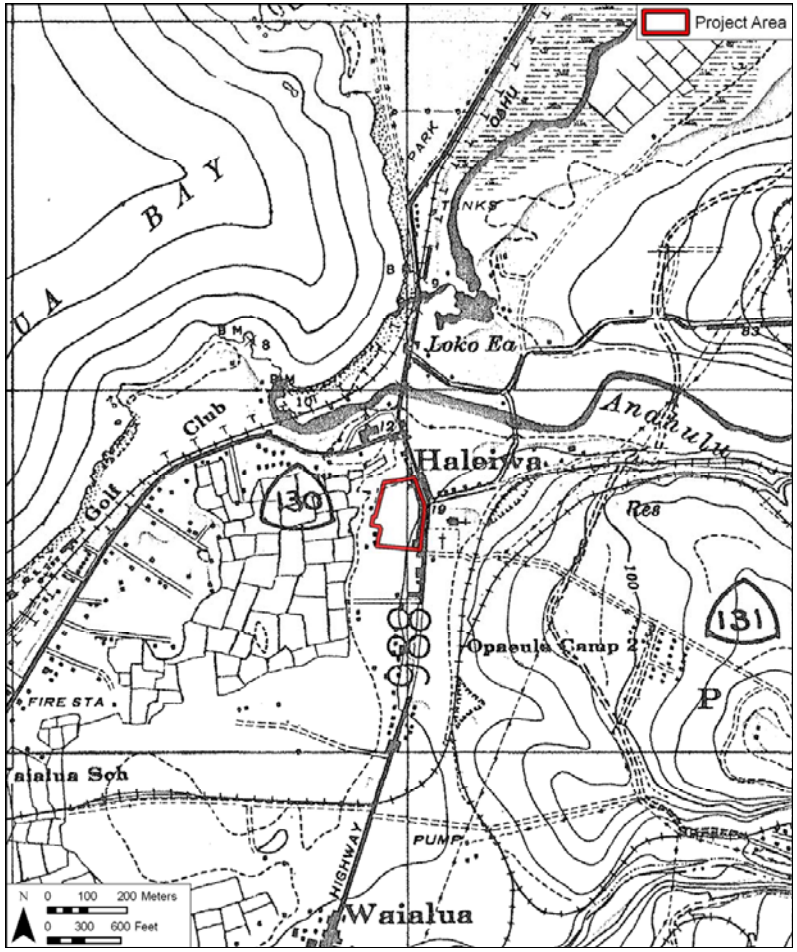

Figure 16. 1943 U.S. War Department map, Haleiwa Quadrangle, showing the project area

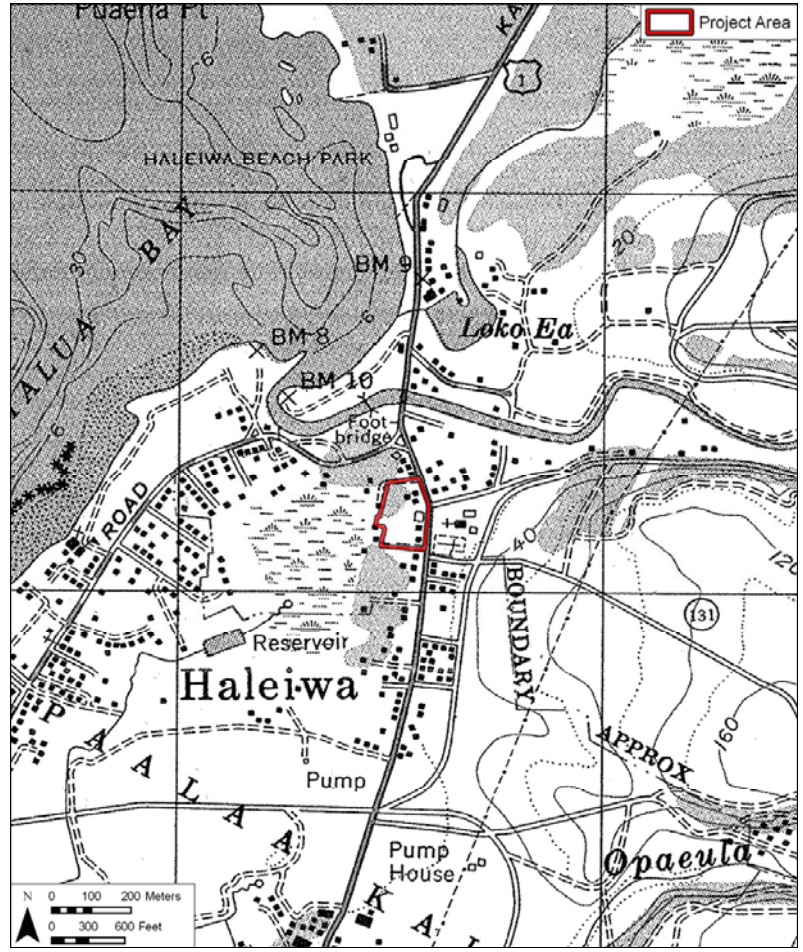

Figure 17. 1953 U.S. Army Mapping Service, Haleiwa Quadrangle, showing the project area

Figure 18. 1978 U.S. Geological Survey Orthophoto, Haleiwa Quadrangle, showing the project area

4.6 Twentieth Century History of the Project Area

Hale‘iwa was designated as a Special Cultural District in 1987, in order to “preserve and enhance Hale‘iwa’s existing rural low-rise, human-scaled form and character, especially along Kamehameha Highway and Haleiwa Road” (City & Co. of Honolulu 1991:3). Only one building within the Hale‘iwa Special District boundary, the Waialua Courthouse, which is not within the project area, is listed on the State Inventory of Historic Places (SIHP site # 80-04-1334).

Five significant historic structures are in the project area, fronting Kamehameha Highway: the M. Yoshida Store-North (now Hale‘iwa Eats) is a structure built in 1923; the M. Yoshida Store-South (now Global Creations Art Gallery) is a structure built in 1923; the Matsumoto Store (also called Matsumoto’s Shave Ice) is a structure built in 1904 and renovated in 1942; Aoki’s Shave Ice is a structure built in 1931; and, the ‘Iwa Gallery is a structure built in 1931.

Shave Ice was a popular, but luxurious, treat in Japan dating back to the first millennium A.D. With the advent of machines to shave the ice, the treat became less expensive, and shave ice stores became common in Japan. The making of shave ice was brought to Hawai‘i by Japanese immigrants who worked in the Hawaiian island’s sugar cane fields. It became a favored refreshment for the tired, thirsty sugar plantation workers. In Hale‘iwa, the Shimoda family began to sell shave ice at the Hale‘iwa Theater in the 1930s. In 1981, Sumie (Shimoda) Aoki and her son Michael opened the Aoki Shave Ice, fronting Kamehameha Highway (Aoki Shave Ice 2010). Matsumoto’s Shave Ice began as the Tanaka grocery store, then became the Matsumoto grocery store in 1951. Mamuro Matsumoto began to sell shave ice in this store. This side business was so successful with the surfers and beachgoers that began to flood the North Shore in the 1960s and on, that they changed the store to a T-shirt, souvenir, and shave ice store (Matsumoto Shave Ice 2010).

The ‘Iwa Art Gallery began as the home of the Akiyama family, who had a photo shop in the front, and living quarters in the rear. It then became the Ikuta’s Watchmaker and then the ‘Iwa Gallery (Jacobs 2006:29). Global Creations is an art gallery, in a structure built by M. Yoshida (M. Yoshida-south) in 1923. Hale‘iwa Eats is a Thai restaurant which opened in 2003 in a structure built by M. Yoshida (M. Yoshida-north) in 1923. Each of the last two structures has the name of the building and the date on the storefront.

Additionally a branch church for the House of Restoration, Assemblies of God, which was founded in 1957 is located within the project area along Kamehameha Hwy. Since this structure is now older than 50 years an architectural significance assessment will be discussed with the SHPD.

The remaining portion of the property has outbuildings and parking lots west of the Kamehameha Street façade, and several non-historic structures, such as the ITC office. A summary of the structures on the project area, as illustrated by the maps in this report, is presented in Table 5. The present configuration of the structures on the property is shown on a 2010 plan view (Figure 19), and former buildings are shown on 1927 and 1957 fire insurance maps (Figure 20 and Figure 21). During the field inspection for this project, photographs were taken of the structures fronting Kamehameha Highway. These are shown in Figure 25 to Figure 22, from north to south along the highway.

Table 5. Summary of Structures in the Project Area from 1883 to 2010

Map Date	Report Figure	Project Description
1883	Fig. 7	No structures shown; adjacent to "Main Road"; in "Konohiki" land
1892	Fig. 8	No structures shown; adjacent to “Alanui e Honolulu” [Main road to Honolulu]; shows Waialua Church at coast
1900	Fig. 11	Shows two structures, one with a fenced yard in the project area; Lili‘uokalani Church and Cemetery shown opposite the project area
1904	‘--	Matsumoto Store structure built in 1904 (Bureau Veritas 2010: 4)
1915	*BE 572	Map refers to the “Waialua Store Lots”; No structures shown
1919	Fig. 12	Eight structures fronting the improved road; five structures in the center; taro lands depicted as marsh
1923	*BE 1124-B	Seven main structures, with dwellings and outbuildings; M. Yoshida-North and M. Yoshida-South structures were built in this year
1927	Fig. 20	Nine main structures; (N to S) Dressmakers, Japanese Store/ Meat (Yoshida-N.) , General Merchandising (Yoshida-S.), Drugstore-Dressmaking (Matsumoto Store), Garage/Auto Sales, Auto Painting (House of Restoration area), General Merchandise, Barber Shop (Aoki Shave Ice area), Jeweler (‘Iwa Gallery area)
1929	Fig. 15	At least 12 structures fronting the "Kamehameha Highway," completely covering the block; possibly two structures in the interior
1931	‘--	Aoki’s Shave Ice and ‘Iwa Gallery structures built in 1931 (Bureau Veritas 2010: 4)
1942	‘--	New single-family residence built behind the Matsumoto store; possible extensive renovations to the original 1904 structure (Hawai‘i Dept. Planning & Permitting records)
1943	Fig. 16	Entire highway frontage with structures
1953	Fig. 17	Five structures shown fronting the highway; one interior structure
1957	Fig. 21	Six main structures on the highway (north to south) Store (M. Yoshida-N), General Merchandising/Gas & Oil (M. Yoshida-S), D. G. & Notions (Matsumoto Store building), large empty space (Garage is gone), House of Restoration Church (built in 1957), Store/Dwelling (Aoki Shave Ice building), Dwelling (‘Iwa Gallery building)
1974 - 1988	‘--	The current ITC Office Building is not present on a 1974 aerial photograph, but is shown on a 1988 aerial photograph (Bureau Veritas 2010:10-11)
2010	Fig. 19	North to South: paved lot, Haleiwa Eats (M. Yoshida-N.), Global Creations (M. Yoshida-S.) & ITC office; Matsumoto Store, parking lot, House of Restoration Church, Aoki's Shave Ice, ‘Iwa Gallery

* Bishop Estate Maps (not shown in report) - BE #572 (Duarte 1915); BE #1124-B (Mann 1923)

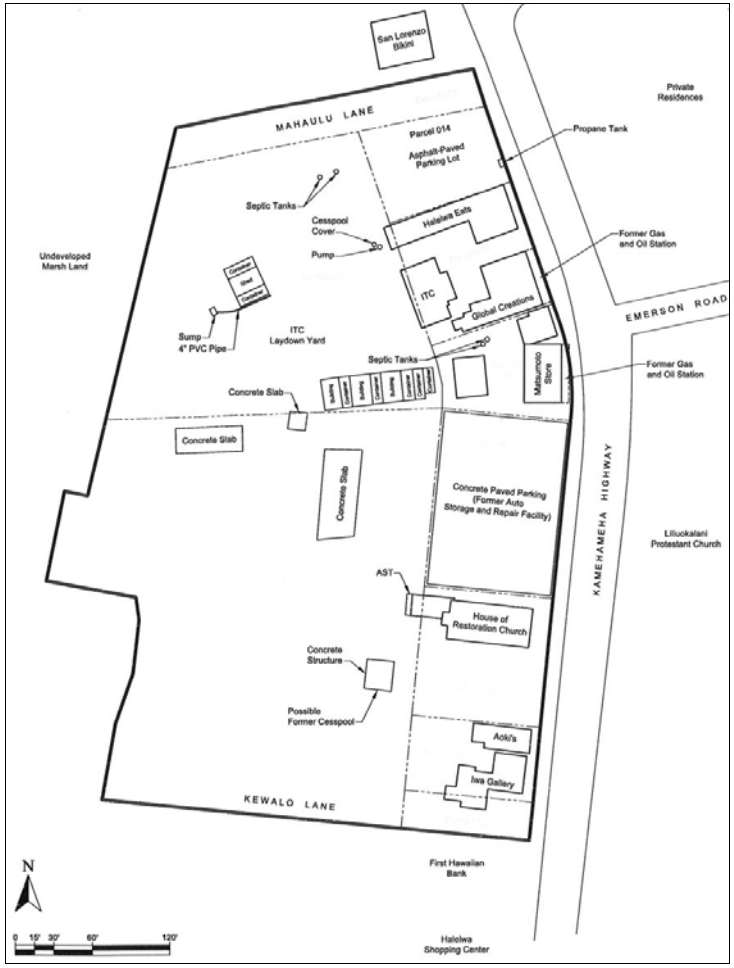

Figure 19. Plan View of present structures within the project area (figure from Bureau Veritas 2010; Figure 2)

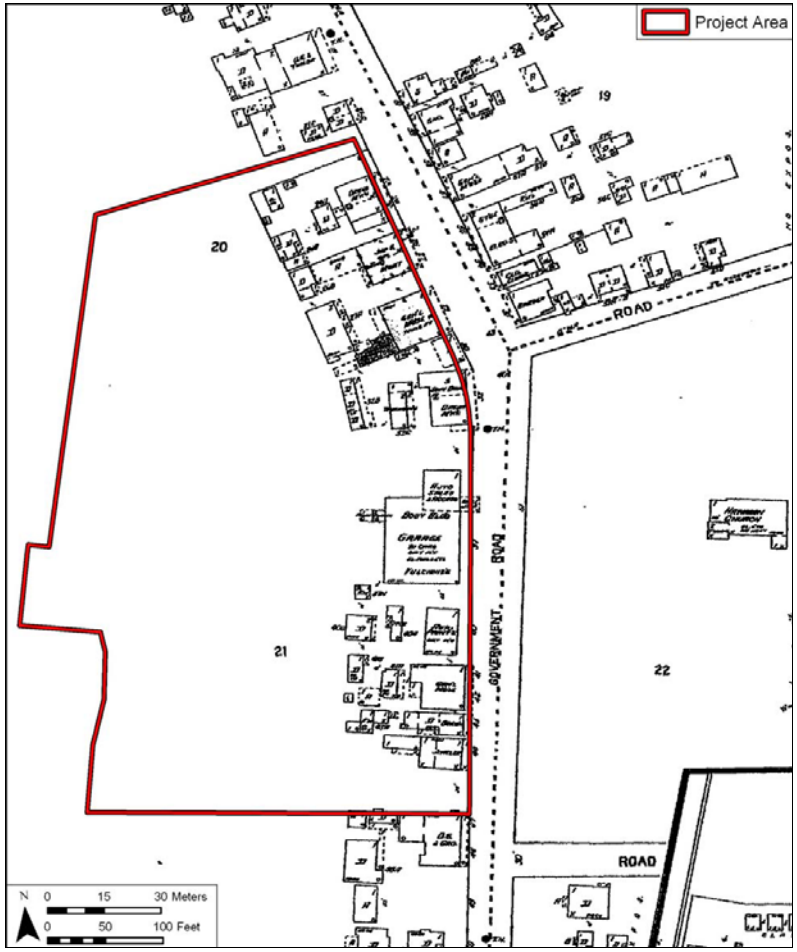

Figure 20. 1927 Sanborn Fire Insurance Map, showing structures within the project area

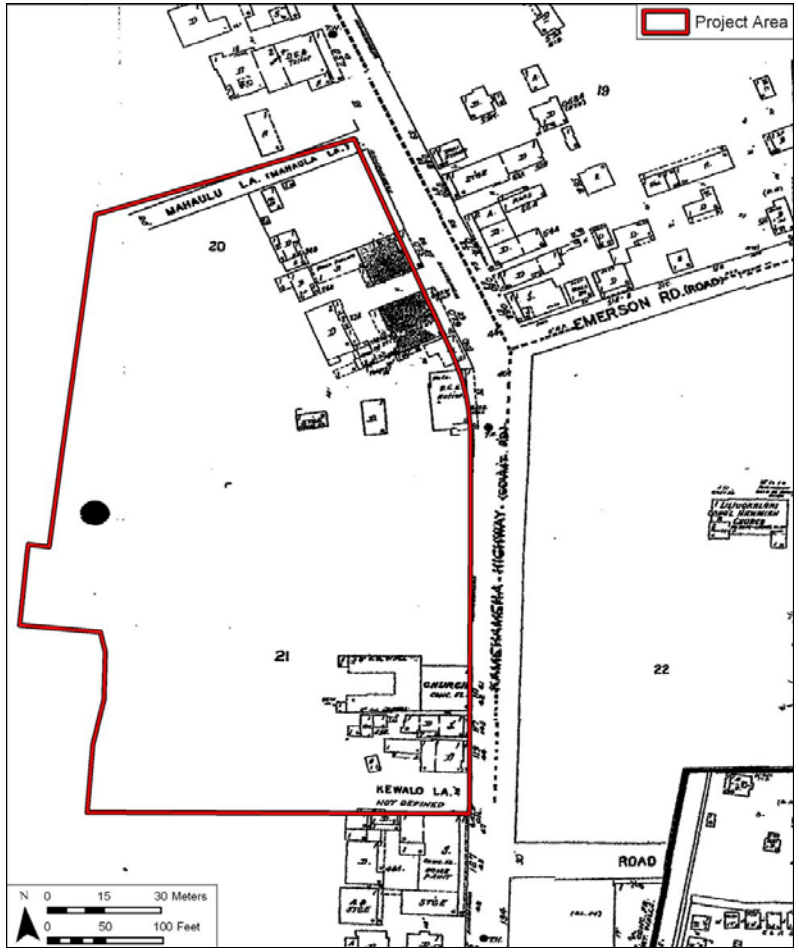

Figure 21. 1957 Sanborn Fire Insurance Map, showing structures within the project area

Figure 22. Hale‘iwa Eats, in M. Yoshida Building-North Building fronting Kamehameha Highway, view to the northwest (CSH Photograph, Oct. 29, 2010)

Figure 23. Global Creations in M. Yoshida-South Building fronting Kamehameha Highway, view to the northwest (CSH Photograph, Oct. 29, 2010)

Figure 24. Matsumoto Shave Ice fronting Kamehameha Highway, view to the northwest (CSH Photograph, Oct. 29, 2010)

Figure 25. Aoki’s Shave Ice and the ‘Iwa Gallery on Kamehameha Highway, view to northwest (CSH Photograph, Oct. 29, 2010)

Section 5 Previous Archaeological Research

5.1 Previous Archaeological Projects

In the 1930s, Gilbert McAllister (1933) undertook the first comprehensive survey of archaeological sites on O‘ahu. He identified 8 sites in Pa‘ala‘a and an additional nine sites in the Kawailoa Ahupua‘a area near Waialua Bay. These sites are listed in Table 6; the sites closest to the current project area are shown on Figure 26. A more detailed description of the Pa‘ala‘a-Kawailoa sites can be found in the Place Names section of this report (see Table 2 and Table 3).

Table 6. Sites Identified by McAllister (1933) in Pa‘ala‘a and Waialua Bay Vicinity

SIHP #*	Site Name and Description
	Pa‘ala‘a Ahupua‘a
220	Pā‘aikanaka, site of the “Cannibal Feasts”"
221	Laukī‘aha Spring flowing into ‘Ōpae‘ula Stream
222	Kumailiaunu, altar on Paukauwila Stream
223	Hekili Heiau, and a fishing shrine called Ka‘ohe
224	Punakai, residence of a *kahuna* (priest) and an altar called Kukui‘ula
225	Kapukapuākea Heiau, destroyed by the time of McAllister’s survey
226	Pōhaku Lana‘i, a balancing stone on Kalaeoiupaoa Point
227	Pu‘upilo Heiau, remnant by Hale‘iwa Courthouse
	Lonoakeahu Heiau, Keehu; not located by McAllister – presumed destroyed
	Kawailoa Ahupua‘a
228	Kepuwai Heiau, destroyed, now the cemetery by Lili‘uokalani Church
229	Kawaipuolu Spring, south of Anahulu Stream
230	Po‘o o Mo‘o and Wāwae o Mo‘o stones
231	Anahulu (Kamani) Heiau, destroyed during construction of the Hale‘iwa Hotel
232	Akua stone in the Anahulu River
233	Loko‘ea Pond
234	Pua‘ena Point; bodies decomposed on a ledge called Kahakakau Kanaka
235	Stone with curative powers near Pua‘ena point
236	‘Uko‘a Fishpond

*SIHP – State Inventory of Historic Places, 50-80-04-

Figure 26. Archaeological Sites Identified by McAllister (1933) near Waialua Bay in Kawailoa and Pa‘ala‘a Ahupua‘a (Google Earth 2008)

Twentieth century archaeological findings from inventory surveys, data recovery projects, and inadvertent finds during development are the main source of our knowledge about the archeological record in Pa‘ala‘a. Archaeological work in the last twenty years in Pa‘ala‘a has not been very extensive. This work has been mainly concentrated along the seaward margins of Pa‘ala‘a Kai. This is largely due to the fact that most of the *makai* portions of the *ahupua‘a* had been developed as housing prior to the implementation of State and Federal Historic Preservation Rules. A number of archaeological investigations have been conducted in the general vicinity of the project area, as shown on Figure 27 and as listed in Table 7.

During the Yent and Beggerly (1977) project, 10 core samples were taken at Kaiaka Bay Beach Park. The samples revealed no traces of any cultural material. Prior to 1900, the project area had been modified for military and agriculture uses and could be a reason for such results. Also the area had been disturbed by artifact hunters (Mitchell 1985).

In 1979, Chiniago, Inc. conducted a cultural resources survey of the Kamehameha Highway Re-Alignment in Hale‘iwa, near the Anahulu River, on the *mauka* side of the present Kamehameha Highway. Four archaeological sites were recorded: Site 1439, a historic deposit; Site 1440, a wall remnant; Site 1441, a series of agricultural terraces; and Site 1443, an old church. Sites 1439 and 1440 were devoid of cultural materials, while Site 1441 was interpreted as a remnant of an old wetland taro terrace system.

In 1981, Martha Yent did an archaeological inspection of the lands adjacent to Kaiaka State Recreation Area. She noted an eroding cultural deposit along the northern coastline of the peninsula. Previous bulldozing damage had disturbed the deposit, which was mainly historical, dating back to the late 1800's- early 1900's (bottle glass, cut class, ceramics, and earthenware). The materials evident on the surface were the remains of plantation workers in the Waialua area around 1900.

In 1985, an archaeological subsurface and surface reconnaissance survey of Pōhaku Lana‘i (50-Oa-D5-6) took place at Kaiaka State Park on Kalaeo‘iupaoa Point (Mitchell 1985). Pōhaku Lana‘i is an oval coralline stone that rests upon a foundation of coralline rock forming a sort of overhang.

A reconnaissance survey was done of the Helemano upland region in 1987 by the Bishop Museum for a proposed sewer trunk line (Frankhauser 1987). The survey included subsurface testing of eight areas of Helemano. No significant prehistoric archaeological sites were found, but an earth oven was found immediately outside the survey area. Any surface sites along the project area were destroyed by either cultivation of pineapples or road building.

In 1988, the Bishop Museum (Simons 1988) undertook an archaeological testing and monitoring project for the Hale‘iwa McDonalds, which led to the discovery of two rock shelters, a historic mango tree, and historic wall feature. All of these features were located outside the project area and no subsequent research was done.

The most extensive and significant archaeology that has been done in the Waialua region was organized by Kirch and Sahlins (Sahlins 1992, Kirch 1992) in what was called the “Anahulu Valley Research Project” (Anahulu, the valley directly bordering Pa‘ala‘a Kai). In 1971, Marshal Sahlins and several staff members of the Bishop Museum began investigating local Hawaiian Society and Economy in the late prehistoric and early historic periods. Archaeological

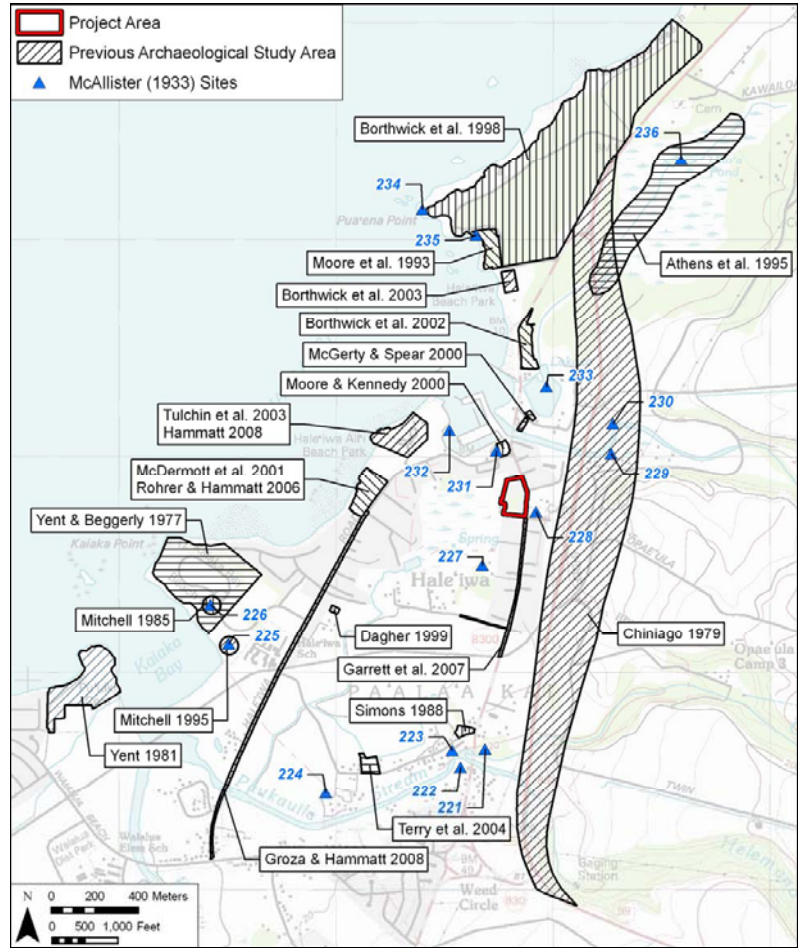

Figure 27. Previous archaeological study areas, with sites identified by McAllister (1933), in Pa‘ala‘a and the Hale‘iwa vicinity (base map. 2009 U.S.G.S., Haleiwa Quadrangle)

Table 7. Archaeological Studies in Pa‘ala‘a Ahupua‘a and Hale‘iwa

Author(s)/ Date	Location	Nature of Work	Findings
McAllister 1933	Coastal - Pa‘ala‘a Kai	Island-wide survey	Identified 12 sites in Pa‘ala‘a and the Pa‘ala‘a-Kawailoa taro lands
Yent & Beggerly 1977	Kaiaka State Recreation Area, Pa‘ala‘a Kai	Reconnaissance Survey & auger core testing	Coring results found no evidence of culture
Chiniago, Inc. 1979	Kamehameha Hwy. north of Anahulu Stream	Cultural Resource Survey	Identified 4 sites: 1439 (Historic Deposit), 1440 (Wall Remains), 1441 (Agricultural Terraces), and 1443 (an old Church)
Yent 1981	TMK 6-7-01:51 Across Kaiaka Bay from State Recreation Area, coastal Kamananui	Archaeological inspection	An eroding cultural deposit circa 1900 was noted
Mitchell 1985	Pōhaku Lana‘i, Kaiaka State Recreation Area, coastal Pa‘ala‘a Kai	Study of site 226 Pōhaku Lana‘i	Mentions previous archaeological findings. Presents historical study. Site 50-Oa-D5-6
Frankhauser 1987	TMK 6-4-04:3 Helemano Military Reservation *mauka* Pa‘ala‘a Kai	Reconnaissance survey with subsurface testing	Three minor historic sites were identified
Simons 1988	TMK 6-6-17:29 McDonald’s in Hale‘iwa, Pa‘ala‘a	Testing & Monitoring	1930 bottle in disturbed stratigraphy, comments on small rock shelters, Mango tree and walls in vicinity
Kirch 1992	Anahulu Valley	Anahulu Valley Research Project	Kirch suggests that because of the abundant marine resources at Waialua it is likely that initial Polynesian settlement of this area dates back to the developmental period
Moore et al. 1993	TMK 6-2-01:4,5,6 & 8 Hale‘iwa Beach Park Extension, Kawailoa	Archaeological Inventory Survey	Identified a historic house site, relocated site 235 - a stone said to have curative powers. Sub-surface testing identified six burials, fire pits, post holes, midden with traditional & historic artifacts

Author(s)/ Date	Location	Nature of Work	Findings
Athens et al. 1995	‘Uko‘a Pond	Paleo-Environmental Research	Provides discussions on environmental changes for the past 8000 years as evidenced by pollen and diatom analysis, sediment accumulation rates, and charcoal particle counts
Mitchell 1995	Kapukapuākea Heiau Kaiaka State Recreation Area, Pa‘ala‘a Kai	Discussion of Site 225	Kapukapuākea Heiau - Nothing remains of the *heiau*. Large rock remains
Borthwick et. al. 1998	TMK 6-1-4:23, 58 and 6-2-1:1,10, Kawailoa	Archaeological Inventory Survey	World War II-era structures and bunkers, an historic trash dump, a Buried Cultural Level, and one Pre-Contact Hawaiian Burial
Dagher 1999	TMK 6-6-12:002, Bishop Estate Lands in coastal Pa‘ala‘a Kai	Inadvertent Human Skeletal Remains	Remains of one individual were identified in an imported sand pile - origin unclear
McGerty 2000	TMK 6-2-3:6 and 9, South of Loko‘ea Pond	Archaeological Inventory Survey	Identified 2 sites: Site 50-80-04-5795 (charcoal deposits), and Site 50-80-04-5839 (Stacked Basalt Boulder Wall)
Moore & Kennedy 2000	TMK 6-6-01:32, Hale‘iwa Joe’s Bar & Grill	Burial Report	Two burials, an adult and a child, were recorded and designated SIHP 50-80-04 5838
McDermott et al. 2001	TMK 6-6-02: por. 01, Hale‘iwa Ali‘i Beach Park	Archaeological Inventory Survey of	Identified 2 sites: Site 50-80-04-5791: the right-of-way for the former O.R. and L. railroad, Site 50-80-04-5850; subsurface cultural layer and burial
Borthwick et al. 2002	TMK 6-2-3:17, 19, 20, 22 and 38, North Shore Skateboard Park, Kawailoa	Archaeological Inventory Survey	3 Sites identified; a segment of the O.R.&L. railroad right of way, a basalt boulder structure, & a subsurface cultural layer
Borthwick et al. 2003	TMK 6-2-1:por. 02, Hale‘iwa Beach Park	Archaeological Inventory Survey	No evidence of burials or subsurface cultural layers
Tulchin et al. 2003	Hale‘iwa Ali‘i Beach Park TMK 6-6-02: por. 01	Archaeological Assessment	No surface historic properties observed
Terry et al. 2004	TMK 6-6-16:16	Archaeological Inventory Survey	One historic trash pit: SIHP # 50-80-04-6693

Author(s)/ Date	Location	Nature of Work	Findings
Rohrer & Hammatt 2006	Hale‘iwa Ali‘i Beach Park, TMK 6-6-02:01	Archaeological Monitoring	Two sites were identified SIHP # 50-80-04-5791, a railroad right-of-way, 5850, a subsurface cultural layer with a burial
Garrett et al. 2007	For the Hale‘iwa Water Main Replacement, Portions of TMKs: (1) 6-02-005, 6-06-004, 6-06-009 & 6-06-010]	Archaeological Monitoring Report	No significant finds
Groza and Hammatt 2008	Hale‘iwa Road Water System Improvements TMK: [1] 6-6-002: 2, 5, 6, 8, 12-15, 20, 21, 31	Archaeological Monitoring Report	Identified SIHP 50-80-04-7033, pre-contact subsurface cultural layer within the A-Horizon containing three pit features, marine shell fragments, coral, and some charcoal.
Hammatt 2008	Hale‘iwa Ali‘i Beach Park TMK 6-6-02: por. 01	Archaeological Monitoring Report	No cultural deposits were found in two trench excavations

investigations in the Anahulu Valley were first undertaken in 1974 and 1976. In 1979, Kirch surveyed the Anahulu Valley archaeological remains and excavated two significant habitation sites and in 1974 and 1976, eight more archaeological sites were identified and described, including two burial caves, five overhanging rock shelters, and a terraced habitation complex. Kirch and Sahlins defined the proto-historic settlement pattern in Waialua District as follows:

> Four main zones of taro irrigation had been developed on these alluvial lands [of Waialua] Handy (1940:85) refers to “large terrace areas along the flatlands between the junction of Helemano and Poamoho Streams and the flatland west of Poamoho.” One of these zones has been totally obliterated by the Waialua Agriculture Company mill and town (Handy and Handy 1972:465). This was the pond field system water by site 208, described by McAllister as “the longest irrigation ditch of which there is any memory” (1933:133; see also Handy 1940:85-86). This ditch or canal, which evidently tapped Kaukonohua Stream about 3 km inland, was later cemented in and used for many years by the plantation. In addition to the main irrigation complexes shown in figure 1.7, there were smaller pond field systems adjacent to the streams as they followed their incised valley courses inland. (Kirch 1992:17)

In 1995, Rudy Mitchell (1995) authored a report discussing the significance of Kapukapuākea Heiau, which was at one time located at Kaiaka State Park, at the coastal area of Pa‘ala‘a Kai. Mitchell recognized the apparent similarities between names from the Kapukapuākea Heiau (one in Pa‘ala‘a Kai and another on Molokai) with Taputapuātea Mārae on Ra‘iātea in the Society Islands.

In 1999, Cathleen Dagher (1999) a Staff Archaeologist at SHPD responded to the inadvertent discovery of isolated human skeletal remains on Bishop Estate Land in Hale‘iwa (Kamananui), very near the current project area. The remains consisted of an isolated cranium on the surface of a sand pile. The sand fill consisted of bits of rusted metal, coral, marine shell, and organic materials, but no other skeletal remains were present. There was no archaeological context for the deposit, however the cranium was identified to be “possible native Hawaiian” and of female gender, over fifty years at the time of death.

Inadvertent human remains were found at the shore near Haleiwa Joe’s Bar and Seafood Grill in 2000 (Moore and Kennedy 2000). In pre-contact times, Kamani (or Anahulu) Heiau was located here; it was destroyed during the 1899 construction of the Haleiwa Hotel on the same property. When the hotel was demolished in 1952, several successive restaurants were built on the land, the Sea View Inn, the Chart House, and then Hale‘iwa Joe’s. The human remains were identified as an adult and a child of Hawaiian ethnicity, dating to the pre-Contact period. The burials were designated SIHP 50-80-04-5838.

In 2000, CSH conducted an archaeological inventory survey and limited subsurface testing of a 5-acre shoreline parcel of Hale‘iwa Ali‘i Beach Park, during which Site 50-80-04-5850 was identified (McDermott et al. 2001). Site 50-80-04-5850, a subsurface cultural layer, is a buried sand A-horizon containing traditional Hawaiian habitation remains such as charcoal, food remains, artifacts, a human burial, and combustion features such as earth ovens. Based on recovered artifacts, food remains, and C^{14}-dating results, this habitation dates to the prehistoric period between AD 1430 and 1680. In addition to Site -5850, preliminary historic background research revealed that at least one historic property was located in the current project area. Site 50-80-04-5791, the right-of-way for the former O.R. and L. railroad, is believed to lie in the immediate vicinity. This railroad was constructed in the last decade of the 19th century and continued operations until World War II. In 2003, additional work at the park was monitored by CSH (Rohrer and Hammatt 2006), and additional portions of the cultural layer and scattered human remains were found in backdirt piles.

CSH completed a burial treatment plan and presentation for The Native Hawaiian burial and cultural layer (Hammatt and Shideler 2001), Site 50-80-04-5850, located on the southwest side of Hale‘iwa Ali‘i Beach Park. Following the directions of the SHPD Burials Program, all skeletal remains were returned to the immediate vicinity of the burial pit, and the trench was backfilled and monitoring was recommended for any subsurface construction activity.

In 2003, CSH conducted an archaeological assessment of a 0.6-acre portion of Hale‘iwa Ali‘i Beach Park (Tulchin et al. 2003). No surface historic properties were identified and monitoring was recommended for any subsurface construction activity. Monitoring was concluded at the Hale‘iwa Ali‘i Beach Park Wastewater Systems project by CSH in 2004 (Hammatt 2008). Although no cultural deposits were encountered during the monitoring phase of the beach park improvements, the archaeologists recommended that an archaeologist continue to monitor all excavations within the park, as burials and cultural deposits have been recorded in the vicinity.

In 2004, CSH conducted an archaeological inventory survey of a 1.5-acre parcel on Pa‘ala‘a Road (Terry et al. 2004). One historic property was documented: State Site 50-80-04-6693, an historic trash pit.

In 2006, CSH (Garrett et al. 2007) conducted excavations associated with the monitoring for water mains improvement in Hale‘iwa, Pa‘ala‘a and Kamananui Ahupua‘a. Archaeological monitors found that Jaucas sand underlay sediments beneath the northern portion of Hale‘iwa Road and a cultural layer (SIHP No. 50-80-04-7033) was observed and documented. Charcoal from Site 7033, Feature B within the cultural layer was AMS dated and calibrated (2 sigma) to AD 1480 to AD 1660.

In 2008, CSH (Groza and Hammatt 2008) conducted monitoring for the Hale‘iewa Road Water Systems Improvements project which extended through Kawailoa, Pa‘ala‘a and Kamananui Ahupua‘a. One archaeological site was recorded, SIHP 50-80-7033, which was a subsurface cultural layer with features. The cultural layer was within an A horizon (former land surface) that developed on the natural Jaucas beach sand and was enriched with indigenous Hawaiian cultural material. Three pit features were originating in the A horizon and intruded into the natural beach sand below. The cultural layer and the pit features were dated to the Pre-contact period.

5.2 Settlement Patterns

Little research has been conducted into the settlement patterns in Pa‘ala‘a, but extensive research has been conducted in the Anahulu Valley (Kirch 1992). In Anahulu Valley, in the *ahupua‘a* of Kawailoa in the eastern portion of the Waialua District, archaeological research has led to the construction of a timeline to chronicle the changes in population density, settlement patterns, agricultural intensification, and the evolution of political complexity. The pre-Contact history of the Hawaiian Islands has been divided into four periods: Colonization, Developmental, Expansion, and Protohistoric. The early Post-Contact Period has been divided into three periods: Conquest, Sandalwood, and Whaling (Kirch 1992:9-17).

5.2.1 Pre-Contact Period

Colonization (A.D. 300-600) first took place in the Hawaiian Islands in well-watered areas with arable land, such as the windward coast of O’ahu from Kahana Valley to Waimānalo. Habitations were clustered along the coast and in fertile river valleys. During the Developmental Period (A.D. 600-1100), habitations and agriculture expanded into more inland areas of the river valleys and into the more favored areas of the leeward coast. In the Expansion Period (A.D. 1100-1650), there was a major expansion into all leeward areas for habitation and agriculture into even the most marginal agricultural zones. The population increased dramatically during this period, and there was an intensification in both wetland and dryland agriculture. Changes in the political system were reflected in the adaptation of the *ahupua‘*a system of land control, and the beginning of intra and inter-island warfare for the control of resources. In the Proto-historic Period (A.D. 1650-1795), all of the island of O‘ahu was occupied and utilized, even arid areas like Ka‘ena. In this period, many large fishponds were built, ceremonial sites become larger and more numerous, and permanent habitations along the coast and in the uplands increased in size. The increase in population led to an intensification of irrigation systems in areas upland of former fields.

5.2.2 Post-Contact Period

The post-Contact period began when the islands were first visited by Captain James Cook in A.D. 1778. The next two decades, called the Conquest Period (A.D. 1778-1812), were marked by inter-island wars, culminating in the consolidation of power by Kamehameha I after his victory in O‘ahu in 1795. In 1804, the Hawaiian chiefs who supported Kamehameha occupied O‘ahu, taking land from the former chiefs. In 1812, the Hawaiian Islands were completely unified when Kaumuali‘i, the chief of Kaua‘i, surrendered to Kamehameha. During the Conquest Period, trade developed between the Hawaiians and foreigners, beginning with the provisioning of ships involved in the Northwest-Canton, China trade, where furs from the Northwest were sold in China for luxury goods. In the following Sandalwood Period (A.D. 1812-1830), chiefs made enormous demands upon the people to gather sandalwood so they could buy Western goods. This period ended in the exhaustion of the sandalwood for trade, and the debt of the *ali‘i.* During the Whaling Period, (A.D. 1830-1848), trade switched to provisioning whaling ships. This period ends with the *Māhele*, which reapportioned the land.

5.2.3 Predictive Model for Pa‘ala‘a

On modern maps, there are ten *ahupua‘a* in the *moku* (district) of Waialua, extending from Ka‘ena on the west end to Waimea (which was only annexed to the district in 1887) on the east end. In claims to the Land Commission, only six *ahupua‘a* are mentioned, Ka‘ena, Kawaihāpai, Mokulē‘ia, Kamananui, Pa‘ala‘a and Kawailoa. Some of the smaller *ahupua‘a*, such as Keālia, were probably considered segments of the more traditional *ahupua‘a* (Sahlins 1992:18). A typical economic pattern for *moku* on O‘ahu was to have one or more lands rich in all types of resources, with other outlying, poorer lands. In Waialua, this pattern is described:

> Ka‘ena on the extreme west and the area of Kapaeloa at the eastern border was occupied by small groups of people who lived mainly by fishing, supplemented by sweet potato cultivation in sandy coastal soils. Ka‘ena has been judged ‘probably the poorest *ahupua‘a* in land resources on O‘ahu, but its seaside faced out onto very rich deep-sea fishing grounds’ (Handy and Handy 1972:467). In marked contrast were the economies of the three *ahupua‘a* at the fertile center of Waialua: Kamananui, Pa‘ala‘a, and Kawailoa (Sahlins 1992:20).

In Waialua, habitations were centered around Kaiaka and Waialua Bays near Pa‘ala‘a and Kawailoa, and on the inland floodplains, where densely packed irrigated fields of taro were cultivated along the four major streams. The population of these *ahupua‘a* has been estimated at 6,000 to 8,000 people before Western Contact (Sahlins 1992:20).

In an interview with Beatrice Krauss, she described the probable settlement of Waialua:

> Let’s say there was a stream here, the fishing village would have been established here [near the mouth of the stream]. The taro would have been grown in the overflow at the mouth of the stream because taro is a marsh plant and that’s the way it grows naturally. So, with a small village and a small population they could have grown enough in that marshy land. When it became overpopulated they could have moved back into the valley. At first they would have moved up along the streams and cleared by the streams—they would have done it also in the overflow—and they would have made little lo‘i next to it. Then as the population

> increased they would have had to go across the whole valley floor and that’s when they would have made their terraces and dug out their lo‘i and connected them all from the stream or spring (Krauss interview in Rosendahl 1977 Appendix B:2).

Early Colonization (A.D. 300-600) would have favored the well-watered areas of the windward coast of O‘ahu, so it is unlikely that any habitation or agricultural sites from this period would be found in the district of Waialua.

For the Development Period (A.D. 600-1100), Kirch and Sahlins (Kirch 1992:14) agree that it would be likely that the eastern section of Waialua in Anahulu, Helemano and Kamananui Valleys would have been utilized early in this period. At ‘Uko‘a Pond (Athens and Ward 1995:121) in Kawailoa near the coast, charcoal from three cores has suggested that initial occupation of the area took place as early as A.D. 800, definitely by A.D. 950.

In the Expansion Period (A.D. 1100-1650), habitation and agricultural areas would have extended into the dryer western Waialua, with the plains used to grow dryland crops such as sweet potatoes and the larger streams used to irrigate taro terraces. Permanent habitation would be clustered on the coast. Evidence for habitation in Waialua for this period comes not only the inland valley sites of Anahulu but also for coastal areas such as at Hale‘iwa State Park, where Moore et al. (1993:70) found three fire pits at a site (Site 50-80-04-4590) along the coast with dates ranging from A.D. 1399-1672 (A.D. 1448-1672, 1420-1628, and 1399-1642). McDermott et al. (2001:60) found a cultural layer at Hale‘iwa Ali‘i Beach Park with one date ranging from A.D. 1440-1650 and a second date from A.D. 1440-1680 (87.4%). Nearer to the project area, a cultural deposit (Site 50-80-04-4657) was found at ‘Āweoweo Beach Park at the eastern end of Mokulē‘ia *Ahupua‘a* (Carlson and Cleghorn 1993), which was dated to A.D. 1440-1700. During this period, the coast may have also been used for human interments.

In the Proto-Historic Period (A.D. 1650-1795), habitations would be found along the coast and in the inland agricultural areas. In this and the following post-Contact Conquest period (A.D. 1778-1812), the construction of wetland agricultural features, such as taro terraces and ‘*auwai* (irrigation ditches) would have intensified.

The Conquest period also marks the introduction of the cultivation of new crops, which were traded to visiting ships in the Sandalwood and Whaling Periods (A.D. 1812-1830; 1830-1848). In Waialua, the greatest effect of these periods was the decline in population, from falling birth rates, from high death rates and the out-migration of young people to find better lives for themselves in the urban areas of the island. In the 1840s, there were cattle in Waialua, and this time period marks the beginning of the construction of large walls to keep the cattle contained (Sahlins 1992:148). The entire flat land between the beach and the mountains was drastically modified during the sugar cane plantation era. Some vestiges of pre-Contact and early post-Contact features remain along the foothills and river edges, but most of the land has been graded and bulldozed, resulting in the destruction of many former habitation and agricultural sites.

In summary, the coastal areas of, Kamananui, and Pa‘ala‘a and the eastern section of Mokulē‘ia probably became a focus for habitation during the Development Period (A.D. 600-1100), expanding into the more arid sections of Mokulē‘ia during the Expansion Period (A.D. 1100-1650), with fishermen exploiting the marine resources of the coast, sweet potatoes grown on the coastal flats, and taro grown in irrigated fields in marshy areas and adjacent to streams.

This traditional Hawaiian lifestyle continued in some areas through the nineteenth century and into the early twentieth century, as native Hawaiians held on to their small plots of land after the *Māhele*. Many of these plots were bought by Westerners beginning in the late nineteenth century and were used for cattle pasturage and later for large-scale sugar cultivation. The Chinese began to use former taro fields and marsh lands for rice fields in the late nineteenth century.

It is expected that remnants of pre-contact/early post-contact traditional Hawaiian use or habitation, including burials, may be found along the coastal portions of Pa‘ala‘a, including areas within the project area, especially at the western half of the project area which still have intact Jaucus sand deposits. The project area during the nineteenth century was in a densely populated zone, with irrigated taro fields with housesites to the west. The construction in 1840-41 of the Protestant Church (now the Lili‘uokalani Church) in a lot adjacent to the eastern boundary of the project area would have been another draw for population increase. There is a cemetery adjacent to the church, once the same location as a *heiau* called Kepuwai. It was completely destroyed before 1933 (McAllister 1933:141)... Cemeteries before 1900 sometimes have unknown boundaries and undocumented burials, which is always a concern. There is no evidence that the boundary of the cemetery ever encroached past the present-day boundary. Although surrounded by taro fields, and later rice fields, the project area itself seems to have been used for pasture in the nineteenth century; therefore, there may not be any evidence for early occupation at the site. Evidence of post-contact use and disturbance of the project is expected, due to the proximity of the sugar cane fields, rice fields, railroad construction, and other nineteenth and twentieth century large-scale landscape transformation. In the 1920s and 1930s, many stores were built by former sugar cane workers, and lots fronting Kamehameha Highway. Several of these structures are still standing (six within the project area), and are considered significant historic structures within the Hale‘iwa Cultural District.

Section 6 Results of Archaeological Inventory Survey

6.1 Surface Survey Findings

On October 29, 2010, a crew from CSH, Todd Tulchin, B.S., Nifae Hunkin, B.A., and Douglas Borthwick, B.A., under the overall supervision of Hallett H. Hammatt, PhD. (principal investigator), conducted a surface survey of the project area. The crew surveyed the parcel for surface archeological sites, took photographs of all structures on the property, and plotted areas for subsurface testing. No traditional archaeological features were noted, however the presence of concrete foundations and six intact historic structures were documented. Structures and open areas in the project area are shown on Figure 28 to Figure 37. Intact structures will be addressed in a separate study in consultation with the Architecture Branch of the SHPD.

Five significant historic structures are in the project area, fronting Kamehameha Highway: the M. Yoshida Store-North (now Hale‘iwa Eats), is a structure built in 1923; the M. Yoshida Store-South (now Global Creations Art Gallery), is a structure built in 1923; the Matsumoto Store (also called Matsumoto’s Shave Ice), is a structure built in 1904; Aoki’s Shave Ice, is a structure built in 1931; and, the ‘Iwa Gallery, is a structure built in 1931. These structures are currently listed as significant historic structures within the Hale‘iwa Special District boundary.

Additionally a branch church for the House of Restoration, Assemblies of God, which was founded in 1957 is located within the project area along Kamehameha Highway. Since this structure is now older than 50 years an architectural significance assessment should be discussed with the SHPD.

Five concrete foundations (A-E) were documented to the west of the standing historic buildings along Kamehameha Highway. The function of the majority of these foundations is unknown. The foundations are currently being used as locations for stockpiling commercial equipment. These foundations have been assigned State Inventory of Historic Places (SIHP) No. 50-80-04-7152.

6.2 Subsurface Excavations Findings

On November 23, 2010 and March 9, 2011, a crew from CSH, Douglas Borthwick, B.A., Rosanna Runyon, B.A., Douglas Thurman, B.A., and Josephine Paolello, under the overall supervision of Hallett H. Hammatt, PhD. (principal investigator), conducted subsurface excavations within the project area. The crew monitored and documented ten trench excavations, recorded project stratigraphy, and took GPS points of all trench locations (Figure 38 through Figure 40).

Observed and documented stratigraphy was rather consistent throughout the project area. The entire project area was covered with a silty clay loam to silt loam modern A horizon (Stratum Ia) containing modern to potentially historic (over 50 years old) debris (a marble, ceramics, glass bottles, window glass, metal fragments, etc.). These materials may have been deposited during frequent flooding events and/or they may indicate evidence of past land use. Several underlying imported fill layers, including gravelly silt loam and sandy clay loam, were designated Strata I. Imported crushed coral fill, observed within Trenches 1 and 2, was designated Stratum II.

Figure 28. The ‘Iwa Gallery and Aoki’s Shave Ice, fronting Kamehameha Highway, southeast corner of project area, view to the southwest (CSH Photograph, Oct. 29, 2010)

Figure 29. Empty lot between Aoki’s Shave Ice and the House of Restoration Church, fronting Kamehameha Highway, view to the northwest (CSH Photograph, Oct. 29, 2010)

Figure 30. House of Restoration Church, fronting Kamehameha Highway, view to the west (CSH Photograph, Oct. 29, 2010)

Figure 31. Gravel parking lot between House of Restoration Church and Matsumoto Grocery and Shave Ice store, fronting Kamehameha Highway, view to the northwest (CSH Photograph, Oct. 29, 2010)

Figure 32. Matsumoto Grocery and Shave Ice Store fronting Kamehameha Highway, view to the northwest (CSH Photograph, Oct. 29, 2010)

Figure 33. Hale‘iwa Eats (M. Yoshida-North building), fronting Kamehameha Highway, view to the southwest (CSH Photograph, Oct. 29, 2010)

Figure 34. House behind (west) of Matsumoto’s Grocery and Shave Ice, view to the northwest (CSH Photograph, Oct. 29, 2010)

Figure 35. Courtyard of house with fountain behind (west) of Global Creations, view to the south-southeast (CSH Photograph, Oct. 29, 2010)

Figure 36. Southwest comer of project area, view to the north (CSH Photograph, Oct. 29, 2010)

Figure 37. Base yard in central section of project area, northern end, view to the south (CSH Photograph, Oct. 29, 2010)

Figure 38. 2005 Aerial photograph (Google Earth 2008) showing locations of excavated trenches

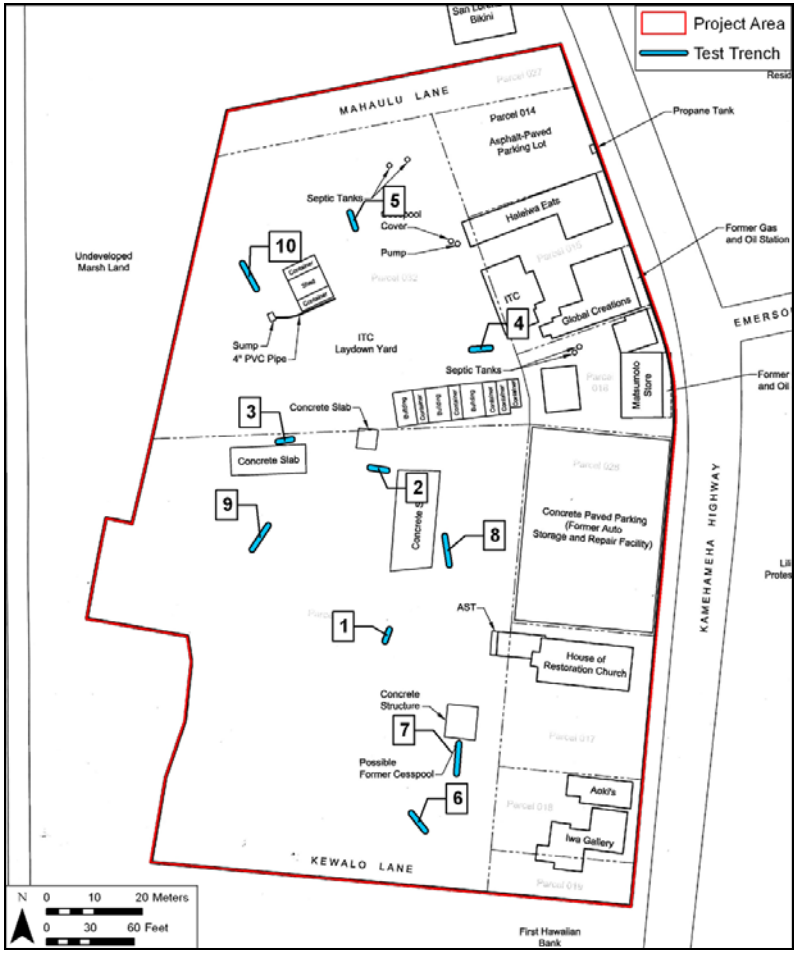

Figure 39. Site Vicinity Map showing locations of excavated trenches (Bureau Veritas 2010)

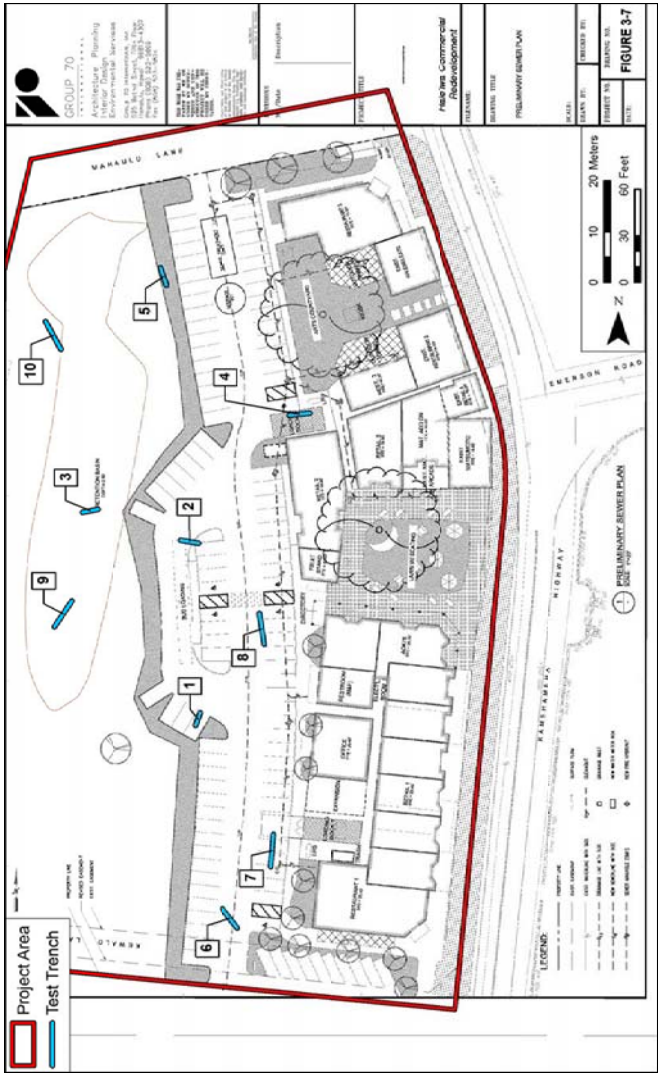

Figure 40. Preliminary plan showing proposed sewer utilities (Group 70 International, Inc. 2011)

The trenches contained one to three natural strata (Strata III-V in Trenches 1 and 2, Strata II-IV in Trenches 3, 4, 6 and 10, Stratum II-III in Trench 5, 7 and 9, and Stratum II in Trench 8) below the modern fill. In general, natural strata included silty clay loam, over the top of dark (gleyed) silty clay, and underlying silty clay sediments. Natural sediments were found approximately 30-65 cm below the current ground surface and were observed to be relatively undisturbed to the water table. Trench profiles, photographs, and stratigraphic descriptions are presented below (Figure 41 through Figure 63, and Table 8 through Table 17).

The dark (gleyed) organically-enriched silty clay, observed within all trenches except Trench 8, (Stratum IV in Trenches 1 and 2, Stratum III in Trenches 3-7 and 9-10), is interpreted as evidence of a buried *lo'i* (irrigated pond-field) deposit associated with the cultivation of wetland *kalo* (taro). This *lo'i* sediment is designated State Inventory of Historic Places (SIHP) No. 50-80-04-7151. Background research and historic maps (see Figure 17) verify the presence of *lo'i* in the vicinity.

6.2.1 Trench 1

Figure 41. Photo of the Trench 1 profile wall, view to north east

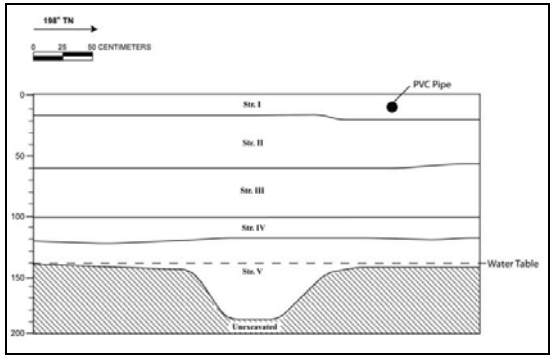

Figure 42. Profile of Trench 1

Table 8. Table Describing Stratigraphy Documented Within Trench 1

Stratum/ Depth	Description
Stratum I (0-20 centimeters below surface - cmbs)	Modern A Horizon; 10YR 3/2 (very dark grayish brown); gravelly silty clay loam; weak, fine, granular structure; moist, very friable consistency; non-plastic; terrigenous sediment; very abrupt and smooth lower boundary; common, fine roots; imported sediment
Stratum II (15-60 cmbs)	Fill; 10YR 7/6 (yellow); crushed coral; structureless, fill; dry, hard consistency; non-plastic; marine sediments; very abrupt and smooth lower boundary; no roots observed; imported fill
Stratum III (60-100 cmbs)	Natural; 5YR 3/3 (dark reddish brown); silty clay loam; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining
Stratum IV (100-120 cmbs)	Natural; 7.5 YR 2.5/1 (black) with very frequent medium sized mottles of 5YR 4/6 (yellowish red); silty clay; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; many, medium and fine rootlets; organically-enriched, possible *lo'i*
Stratum V (115-180 cmbs)	Natural; 5YR 4/4 (reddish brown) with very frequent, small to medium sized mottles of 5YR 4/6 (yellowish red); silty clay loam; moderate, medium, blocky structure; moist, friable consistency; plastic; terrigenous sediment; few, fine rootlets, contains mottles of iron staining

6.2.2 Trench 2

Figure 43. Photo of the Trench 2 profile wall, view to west

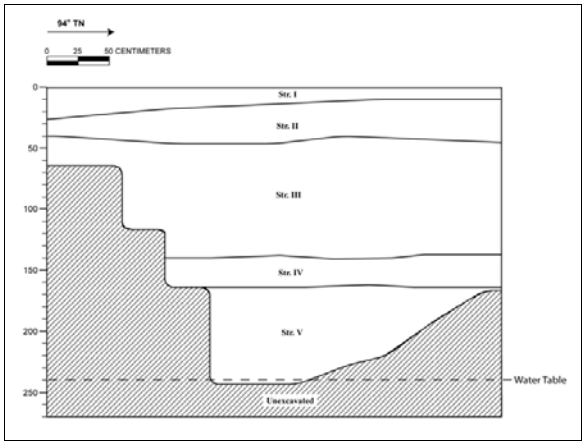

Figure 44. Profile of Trench 2

Table 9. Table Describing Stratigraphy Documented Within Trench 2

Stratum/ Depth	Description
Stratum I (0-25 cmbs)	Modern A Horizon; 10YR 3/2 (very dark grayish brown); gravelly silty clay loam; weak, fine, granular structure; moist, very friable consistency; non-plastic; terrigenous sediment; very abrupt and smooth lower boundary; common, fine roots; imported sediment
Stratum II (10-45 cmbs)	Fill; 10YR 7/6 (yellow); crushed coral; structureless, fill; dry, hard consistency; non-plastic; marine sediments; very abrupt and smooth lower boundary; no roots observed; imported fill
Stratum III (45-140 cmbs)	Natural; 5YR 3/3 (dark reddish brown); silty clay loam; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining
Stratum IV (140-165 cmbs)	Natural; 7.5 YR 2.5/1 (black) with very frequent medium sized mottles of 5YR 4/6 (yellowish red); silty clay; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; many, medium and fine rootlets; organically-enriched, possible *lo'i* sediment
Stratum V (165-245 cmbs)	Natural; 5YR 4/4 (reddish brown) with very frequent, small to medium sized mottles of 5YR 4/6 (yellowish red); silty clay loam; moderate, medium, blocky structure; moist, friable consistency; plastic; terrigenous sediment; few, fine rootlets, contains mottles of iron staining

6.2.3 Trench 3

Figure 45. Photo of the Trench 3 profile wall, view to southeast

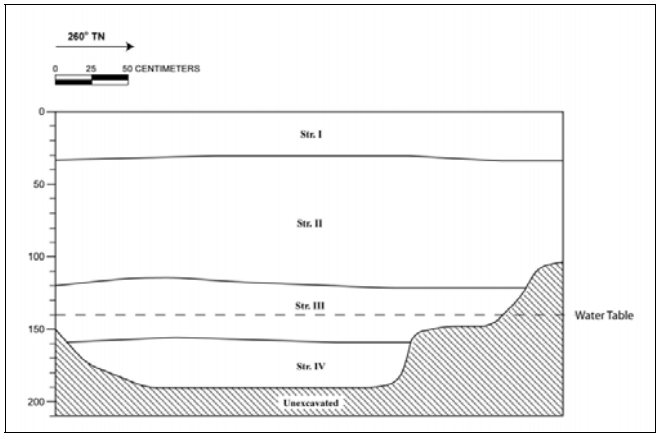

Figure 46. Profile of Trench 3

Table 10. Table Describing Stratigraphy Documented Within Trench 3

Stratum/ Depth	Description
Stratum I (0-33 cmbs)	Modern A Horizon; 10YR 3/1 (very dark gray); silt loam; weak, fine, granular structure; moist, loose consistency; non-plastic; terrigenous sediment; abrupt and smooth lower boundary; many, medium roots; blue on white ceramic sherd, glass fragments, and a marble collected from upper portion of stratum; imported sediment possibly mixed with a nearby disturbed trash pit and deposited during a common flooding episode
Stratum II (30-120 cmbs)	Natural; 2.5Y 5/6 (light olive brown) with very frequent, small to medium sized mottles of 2.5Y 3/2 (very dark grayish brown); silty clay loam; structureless, massive; moist, firm consistency; plastic; abrupt and smooth lower boundary; common fine to very fine rootlets; contains mottles of iron staining
Stratum III (115-160 cmbs)	Natural; Gley1 2.5/10Y (very dark bluish gray); silty clay; structureless, massive; moist, friable consistency; slightly plastic; terrigenous sediment; many, very fine rootlets; organically-enriched, possible *lo'i* sediment
Stratum IV (155-190 cmbs)	Natural; 5YR 4/4 (reddish brown) with very frequent, small to medium sized mottles of 5YR 4/6 (yellowish red); silty clay loam; moderate, medium, blocky structure; moist, friable consistency; plastic; terrigenous sediment; few, fine rootlets, contains mottles of iron staining

6.2.4 Trench 4

Figure 47. Photo of the Trench 4 profile wall, view to southeast

Figure 48. Photo of Trench 4 profile wall close-up, view to south

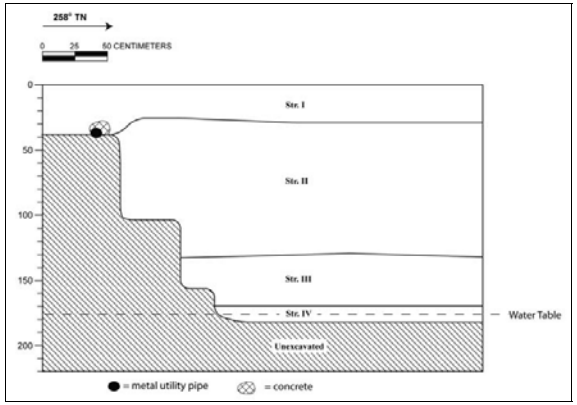

Figure 49. Profile of Trench 4

Table 11. Table Describing Stratigraphy Documented Within Trench 4

Stratum/ Depth	Description
Stratum I (0-40 cmbs)	Modern A Horizon; 10YR 3/2 (very dark grayish brown); very gravelly silty clay loam; weak, fine, granular structure; moist, very friable consistency; non-plastic; terrigenous sediment; very abrupt and smooth lower boundary; common, fine roots; contains a metal utility pipe; imported sediment
Stratum II (30-135 cmbs)	Natural; 5YR 3/3 (dark reddish brown); silty clay loam; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining
Stratum III (135-173 cmbs)	Natural; Gley2 3/5PB (very dark bluish gray); silty clay; structureless, massive; moist, friable consistency; plastic; terrigenous sediment; many, fine to medium sized rootlets; contained one piece of faunal bone, possible gourd fragments, and charcoal flecking; organically-enriched, possible *lo ‘i* sediment
Stratum IV (173-185 cmbs)	Natural; 5YR 4/4 (reddish brown) with very frequent, small to medium sized mottles of 5YR 4/6 (yellowish red); silty clay loam; moderate, medium, blocky structure; moist, friable consistency; plastic; terrigenous sediment; few, fine rootlets, contains mottles of iron staining

6.2.5 Trench 5

Figure 50. Photo of the Trench 5 profile wall, view to southwest

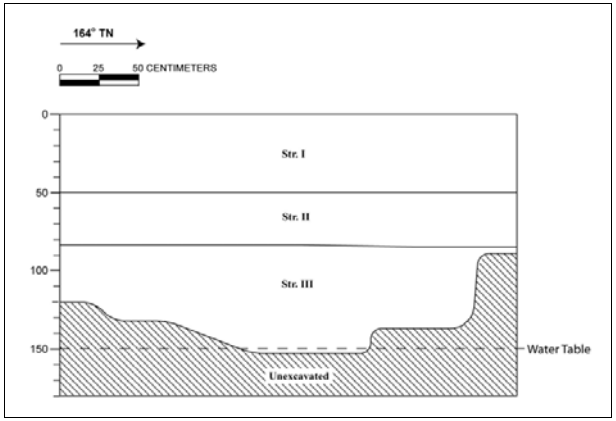

Figure 51. Profile of Trench 5

Table 12. Table Describing Stratigraphy Documented Within Trench 5

Stratum/ Depth	Description
Stratum I (0-50 cmbs)	Modern A Horizon; 10YR 3/3 (dark brown); very gravelly clay; structureless, fill; moist, very friable consistency; slightly plastic; terrigenous sediment; clear and smooth lower boundary; imported sediment mixed with gravel
Stratum II (50-85 cmbs)	Natural; 7.5YR 3/3 (dark brown) with frequent large mottles of 5YR 4/4 (reddish brown); silty clay; structureless, massive; moist, firm consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining
Stratum III (85-155 cmbs)	Natural; Gley2 3/5PB (very dark bluish gray); silty clay; structureless, massive; moist, friable consistency; plastic; terrigenous sediment; many, fine to medium sized rootlets; contained one piece of faunal bone, possible gourd fragments, and charcoal flecking; organically-enriched, possible *lo ‘i* sediment

6.2.6 Trench 6

Figure 52. Photo of the Trench 6 profile wall, view to southeast

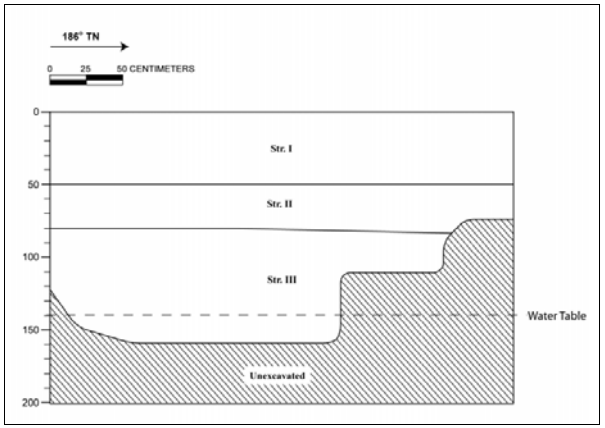

Figure 53. Profile of Trench 6

Table 13. Table Describing Stratigraphy Documented Within Trench 6

Stratum/ Depth	Description
Stratum I (0-50 cmbs)	Modern A Horizon; 10YR 3/2 (very dark grayish brown); gravelly silty clay loam; weak, fine, granular structure; moist, very friable consistency; non-plastic; terrigenous sediment; very abrupt and smooth lower boundary; common, fine roots; imported sediment
Stratum II (50-85 cmbs)	Natural; 5YR 3/3 (dark reddish brown); silty clay loam; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining
Stratum III (85-160 cmbs)	Natural; Gley2 3/5PB (very dark bluish gray); silty clay; structureless, massive; moist, friable consistency; plastic; terrigenous sediment; many, fine to medium sized rootlets; contained one piece of faunal bone, possible gourd fragments, and charcoal flecking; organically-enriched, possible *lo ‘i* sediment

6.2.7 Trench 7

Figure 54. Photo of Trench 7 profile wall, view to southeast

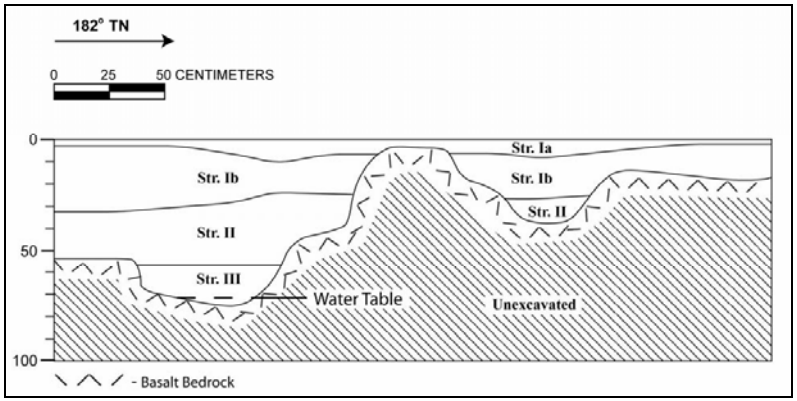

Figure 55. Profile of Trench 7

Table 14. Table Describing Stratigraphy Documented Within Trench 7

Stratum/ Depth	Description
Stratum Ia (0- 20 cmbs)	Modern A Horizon; 10YR 2/2 (very dark brown); silt loam; moderate, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous sediment; abrupt and smooth lower boundary; common, fine to medium roots; organic topsoil containing modern trash (plastic, glass, metal debris, etc.)
Stratum Ib (5- 65 cmbs)	Fill; 10 YR 3/3 (dark brown) mixed with 10YR 2/2 (very dark brown); sandy clay loam; moderate, fine to medium, crumb structure, moist, very friable to loose consistency; non-plastic, mixed sediment; clear, smooth to wavy lower boundary; few fine to medium roots, possibly contaminated fill, contains metal debris (wire, mechanical parts, etc.), glass bottles and window glass.
Stratum II (50-112 cmbs)	Natural; 5YR 3/3 (dark reddish brown); silty clay loam; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining
Stratum III (112-150 cmbs)	Natural; Gley2 3/5PB (very dark bluish gray); silty clay; structureless, massive; moist, friable consistency; plastic; terrigenous sediment; many, fine to medium sized rootlets; contained one piece of faunal bone, possible gourd fragments, and charcoal flecking; organically-enriched, possible *lo‘i* sediment

6.2.8 Trench 8

Figure 56. Photo of Trench 8 profile wall, view to southeast

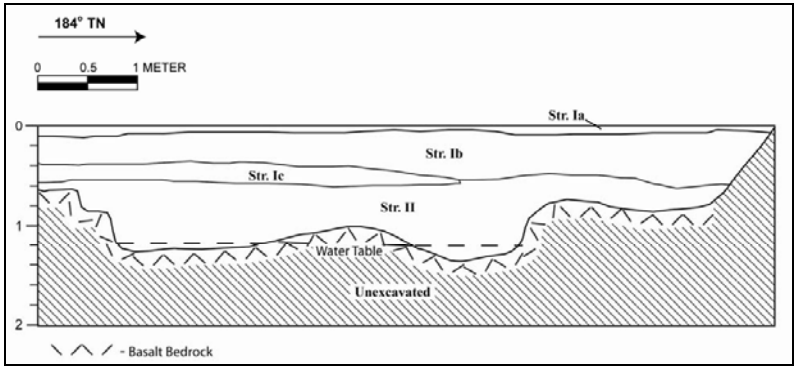

Figure 57. Profile of Trench 8

Table 15. Table Describing Stratigraphy Documented Within Trench 8

Stratum/ Depth	Description
Stratum Ia (0- 10 cmbs)	Modern A Horizon; 10YR 2/2 (very dark brown); silt loam; moderate, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous sediment; abrupt and smooth lower boundary; common, fine to medium roots; organic topsoil containing modern trash (plastic, glass, etc.)
Stratum Ib (5- 65 cmbs)	Fill; 7.5 YR 3/3 (dark brown); sandy clay loam; moderate, fine to medium, crumb structure, moist, friable consistency; slightly plastic, mixed sediment; clear, smooth to wavy lower boundary; common medium roots, contains coral and gravel
Stratum Ic (37- 57 cmbs)	Fill; 10 YR 2/1 (black); sandy clay loam; moderate, medium, crumb structure; moist, very friable consistency; non-plastic; mixed sediment; clear, discontinuous lower boundary
Stratum II (50-135 cmbs)	Natural; 5YR 3/2 (dark reddish brown); clay loam; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining

6.2.9 Trench 9

Figure 58. Photo of Trench 9, view south

Figure 59. Photo of Trench 9 showing area of sampling, view to southeast

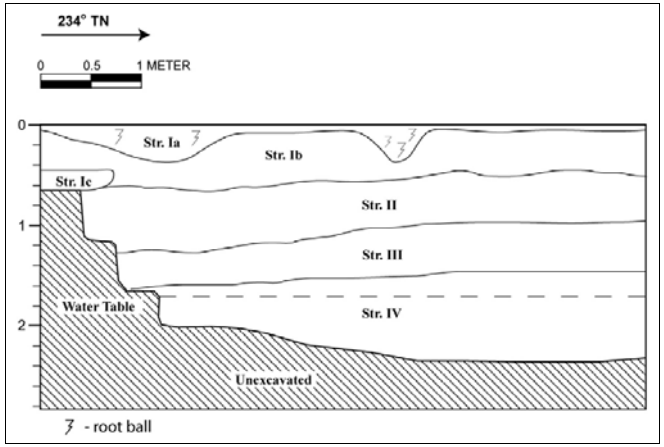

Figure 60. Profile of Trench 9

Table 16. Table Describing Stratigraphy Documented Within Trench 9

Stratum/ Depth	Description
Stratum Ia (0-37 cmbs)	Modern A Horizon; 10YR 2/2 (very dark brown); silt loam; moderate, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous sediment; abrupt and smooth lower boundary; common, fine to medium roots; organic topsoil containing modern trash (plastic, glass, etc.)
Stratum Ib (5- 63 cmbs)	Fill; 10YR 3/1 (very dark gray); gravelly silt loam; moderate, fine, crumb structure; moist, very friable consistency; non-plastic; terrigenous sediment; clear and smooth lower boundary; many medium and coarse roots
Stratum Ic (45-65 cmbs)	Fill; 2.5Y 6/1 (gray); sand; structureless, singlegrain; moist, loose consistency; non-plastic; abrupt and discontinuous; imported utility fill material
Stratum II (45-125 cmbs)	Natural; 2.5Y 5/6 (light olive brown) with very frequent, small to medium sized mottles of 2.5Y 3/2 (very dark grayish brown); silty clay loam; moderate, medium, blocky structure; moist, friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; common fine to medium rootlets along upper limits

Stratum III (95-160 cmbs)	Natural; Gley1 2.5/10Y (very dark bluish gray); silty clay; structureless, massive; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; common fine rootlets, organically-enriched, possible *lo ‘i* sediment
Stratum IV (145-235 cmbs)	Natural; 5YR 3/2 (dark reddish brown); silty clay; structureless, massive; wet, sticky consistency; very plastic; terrigenous sediment

6.2.10 Trench 10

Figure 61. Photo of Trench 10, view to northwest

Figure 62. Photo of Trench 10 showing profile wall close-up, view to northwest

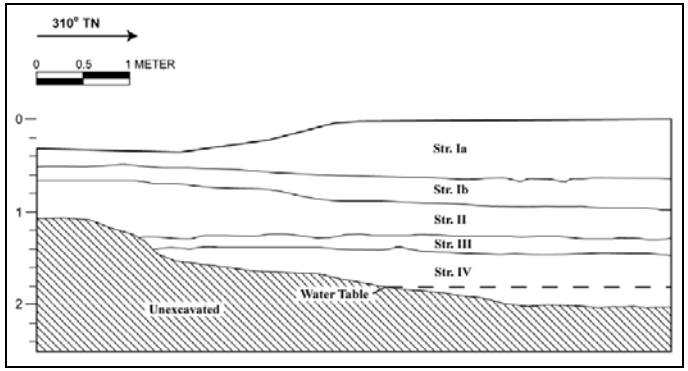

Figure 63. Profile of Trench 10

Table 17. Table Describing Stratigraphy Documented Within Trench 10

Stratum/ Depth	Description
Stratum Ia (0- 65 cmbs)	Modern A Horizon; 5 YR 2.5/2 (dark reddish brown); silty clay; moderate, fine, crumb structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; many medium to coarse roots; organic topsoil containing modern trash (metal, glass, ceramics, etc.)
Stratum Ib (50- 95 cmbs)	Fill; 7.5 YR 3/1 (very dark gray); sandy clay loam; structureless, massive, moist, friable consistency; non- plastic, terrigenous sediment; abrupt and smooth lower boundary; few fine rootlets; likely a result of runoff from an adjacent sewer lagoon
Stratum II (65-130 cmbs)	Natural; 5YR 3/3 (dark reddish brown); silty clay loam; moderate, medium, blocky structure; moist, very friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; few, very fine rootlets; contains mottles of iron staining
Stratum III (125- 145 cmbs)	Natural; 7.5 YR 2.5/1 (black); silty clay; structureless, massive; moist, friable consistency; plastic; terrigenous sediment; clear and smooth lower boundary; many, fine rootlets; possible *lo’i* sediment
Stratum IV (140- 200 cmbs)	Natural; 5YR 3/3 (dark reddish brown); silty clay loam; massive, structureless; wet, sticky consistency; plastic; terrigenous sediment

6.3 Historic Property Descriptions

Two historic properties were documented during this project investigation. The sites consist of *lo‘i* (irrigated pond-field) agricultural sediments (SIHP # -7151) and concrete foundations (SIHP # -7152).

6.3.1 SIHP # 50-80-04-7151

FORMAL TYPE:	*Lo‘i* (irrigated pond-field) Deposit
FUNCTION:	Agriculture
# OF FEATURES:	None
AGE:	Undetermined
DIMENSIONS:	Approximately 131 m N/S by 55 m E/W
LOCATION:	Throughout Project Area (Trenches 1-7, 9, and 10); UTM Coordinates*: 2387815.85N, 592814.97E (center pt.)
TAX MAP KEY:	TMK: [1] 6-6-004: 032
LAND JURISDICTION:	Kamehameha Schools Bishop Estate

* UTM Datum = NAD 83, Zone 4N

SIHP # 50-80-04-7151 consists of a buried *lo‘i* (irrigated pond-field) deposit associated with the cultivation of wetland *kalo* (taro). The site was observed within all excavated trenches except Trench 8 (Figure 64). The site was found ranging from 85 cm to 173 cm below the ground surface. The *lo‘i* agricultural deposit consisted of dark (gleyed) organically-enriched silty clay sediments. Figure 65 shows a sub-sample of the collected sediment. The site boundary is based on test excavations, however, the site may extend through other portions of the project area, particularly to the north, south or west. It is unlikely the site extends to the east due to heavy disturbance related to existing and previously existing commercial structures along Kamehameha Highway.

Bulk sediment samples were collected from SIHP # -7151 (Stratum IV in Trenches 1 and 2, Stratum III in Trenches 3-7 and 9-10). Material collected from these samples consisted of organics (roots, charcoal, seeds, *kukui* [*Aleurites moluccana]*, possible gourd, and unknown organics), faunal material (animal bone), artifacts (Acc.’s #1 and 2), and basalt, decomposing basalt, and coral. Artifacts include a volcanic glass flake (Acc. #1) and a ground stone tool fragment (Acc. #2), both recovered from Trench 5, Stratum III. The ground stone tool fragment appears to be a broken off piece of a finished adze tip.

The majority of all samples contained abundant light fraction rootlets, or light materials which floated to the top of the water during initial analysis. Roots which were too heavy to float were collected during analysis of the heavy fraction materials. Root casts or root tubules were also found in several of the samples. Root casts generally result from the depletion of minerals “that form around roots as a result of fluctuating soil-moisture and decay of root” (Kraus and Hasiotis 2006:634). Microbial communities in surface-water gley conditions, degrade organic matter and leach minerals, such as iron, outward, forming these root casts (Kraus and Hasiotis 2006). It is important to understand that these root casts are not only found within the surface-water areas where plants thrive but are formed within the root systems of decomposed plants.

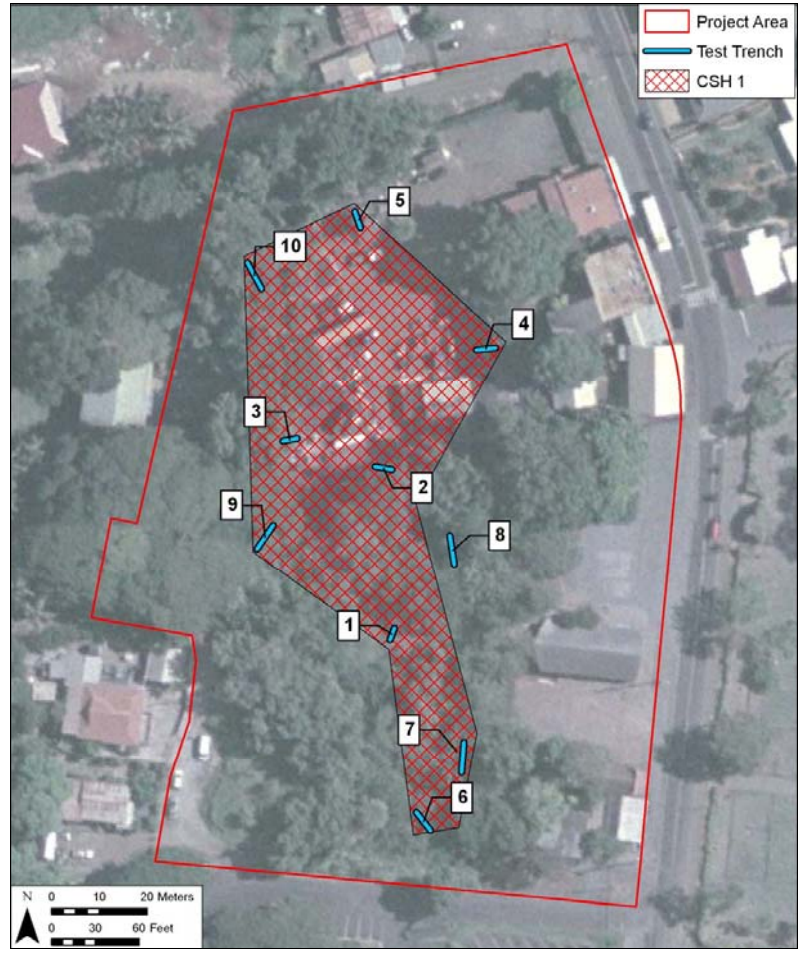

Figure 64. 2008 Aerial Photograph (Google Earth 2008) showing trench locations and SIHP # -7151 site boundary

Several other archaeological studies have found these root casts in association with buried and abandoned *lo‘i* sediments:

> Previous archaeological projects in Mākaha Valley, O‘ahu, and Hālawa Valley, Molokai have documented the appearance of pondfield soils in which irrigated taro has been cultivated (Morgenstein and Burnett 1972; Riley 1975). These soils are characterized by hydrated iron-oxide (limonite) tubes which appear as prominent reddish mottles. These ferrogenous tubes are known to develop around the roots of taro plants, although the mechanism of concentration is not well understood . . . These tubes or mottles were quite prominent in the soil core we took in a recently cultivated lo‘i in Hanalei Valley. (Schilt 1980:29)

Morgenstein’s work with abandoned and buried *lo‘i* sediments in Kawainui Marsh, Kailua, O‘ahu documented abundant diffused charcoal particles and former root tubes stained red/oranged with “ferruginous oxyhydroxides,” which were interpreted as directly related to the function of former pond fields (e.g. taro cultivation) (Morgenstein 1978:7-8). Based on Morgenstein’s (1978) sediment profiles, the iron oxyhydroxide root tubes he observed in Kawainui Marsh were quite pronounced and very “tube-like.”

The high amount of organic material recovered from sediment samples collected from SIHP # -7151 and the presence of root casts within and below SIHP # -7151, is consistent with expectations for irrigated agricultural (*lo‘i)* sediment. Cultural activity within the site is further evidenced by charcoal and artifacts documented within the analyzed sediment samples. Furthermore, according to LCAs adjacent to the project area, background research, and historic maps (see Figure 17), *lo‘i* agriculture has been documented in the vicinity of the project area.

Figure 65. Photo of sediment collected from Trench 5, Stratum III

6.3.2 SIHP # 50-80-04-7152

FORMAL TYPE:	Concrete Foundations
FUNCTION:	Commercial Use
# OF FEATURES:	5
AGE:	Historic, likely early 19th century
DIMENSIONS:	A (5.9 m N/S x 16.2 m E/W), B (4.2 m N/S x 4.2 m E/W), C (21.1 m N/S x 8.6 m E/W), D (7.5 m N/S x 9 m E/W), E (6.9 m N/S x 6.9 m E/W)
LOCATION:	South Half of Project Area UTM Coordinates: 2389805.07N, 592823.29E (center of Foundation C)
TAX MAP KEY:	TMK: [1] 6-6-004: 013, 032
LAND JURISDICTION:	Kamehameha Schools Bishop Estate

This site consists of five concrete foundations (A-E) located within the southern half of the project area (Figure 66). The foundations are situated to the west of several historic buildings fronting Kamehameha Highway. The original function and use of most of these features is unknown. Currently the foundations are being used for stock piling of commercial items by ITC Water Management Inc. (ITC). No inscriptions indicating dates of construction were observed on any of the concrete foundations. According to historic maps and background research, it is likely these foundations date to the early 19th century.

Feature A consists of a rectangular concrete pad measuring 5.9 m N/S by 16.2 m E/W. The pad is currently covered with commercial mechanical parts and piping (Figure 67). The function of this feature is unknown.

Feature B consists of a small square concrete pad measuring 4.2 m N/S by 4.2 m E/W. The pad is currently covered with commercial mechanical parts and equipment (Figure 68). The function of this feature is unknown.

Feature C consists of a large trapezoid concrete pad measuring 21.1 m N/S by 8.6 m E/W. A trench (approximately 1 m deep) runs along the inside northwest portion of the feature (Figure 69 and Figure 70). The landowner relates that this feature had been an automotive repair shop.

Feature D consists of a large concrete pad measuring approximately 7.5 m N/S by 9 m E/W, located directly behind (west of) the House of Restoration Church (Figure 71). Approximately 1.8 m to the north, a concrete sidewalk runs roughly parallel (E/W) to the northern side of the feature (Figure 72). A small concrete upper tier was observed along the east side of the feature. This upper tier is raised approximately 10 cm higher than the rest of Feature D and measures 4.65 m N/S by approximately 2 m E/W (Figure 73). All southern and eastern edges of Feature D are covered in soil and grasses. The function of this feature is unknown.

Feature E consists of a square foundation containing low concrete walls (Figure 74). The feature measures 6.9 m N/S by 6.9 m E/W. The concrete walls stand approximately one meter high and approximately 15 cm thick (Figure 75). A dilapidated possible roof made of corrugated metal was observed in the interior of the feature. Several metal pipes observed in the vicinity of the feature suggest it may have been a former cesspool. A concrete sidewalk (running E/W) was observed just south of the southern wall of the feature.

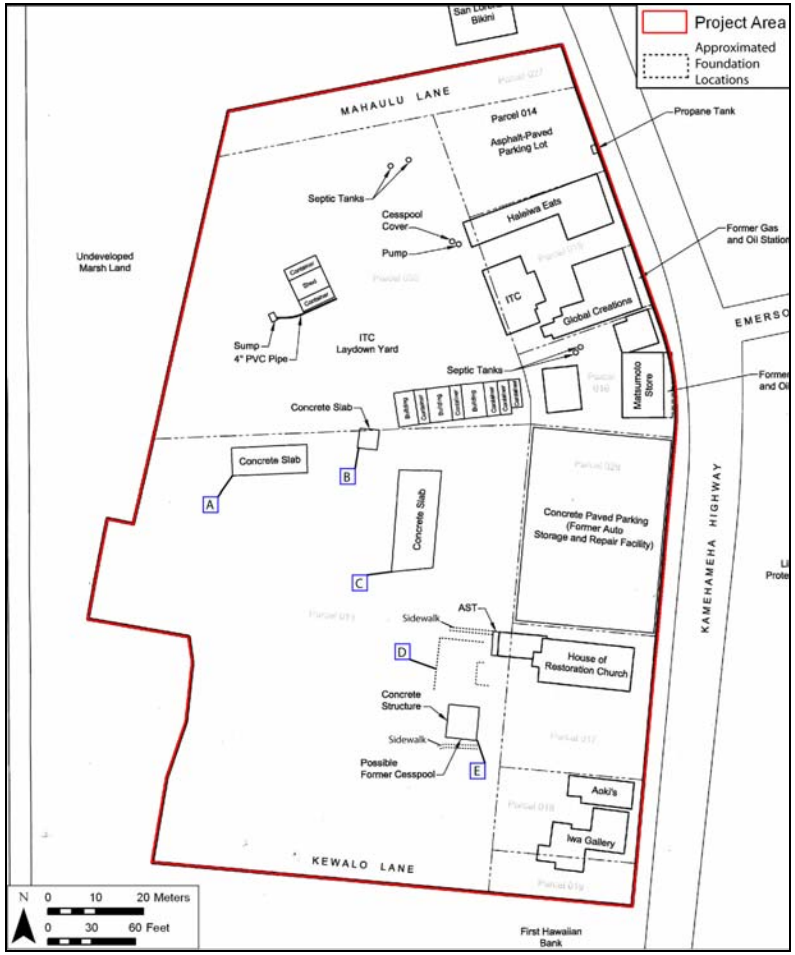

Figure 66. Site Vicinity Map showing locations of concrete features (A-E)

Figure 67. Photo of Foundation A, view to west

Figure 68. Photo of Foundation B, view to northeast

Figure 69. Photo of Foundation C, view to south

Figure 70. Photo of Foundation C, view to north

Figure 71. Photo of Feature D, view to east (notice the House of Restoration Church in background)

Figure 72. Photo of Feature D sidewalk along north side of foundation, view to east

Figure 73. Photo of Feature D upper tier, view to northeast

Figure 74. Photo of Feature E, view to north (notice the sidewalk in foreground)

Figure 75. Photo of Feature E, view to the north

Section 7 Results of Laboratory Analysis

7.1 Analysis of Collected Materials from Bulk Samples

Thirteen (13) sediment samples were collected from trench excavations and were analyzed. Bulk sediment samples were collected from natural stratigraphic layers in order to access the cultural content of these layers. A total of three artifacts (Acc. # 1-3) were recovered during analysis of the samples. Artifacts included one volcanic glass flake (Acc. #1), one ground stone tool fragment (Acc. #2), and one metal fragment (Acc. #3) (Table 18). The two traditional Hawaiian artifacts, the volcanic glass flake and ground stone tool fragment, were collected from Trench 5, Stratum III, within SIHP # -7151. The metal fragment was collected from an upper fill stratum and is therefore not associated with a designated site.

Material collected from analyzed bulk samples consisted of organics (roots, charcoal, seeds, *kukui* [*Aleurites moluccana]*, possible gourd, and unknown organics), faunal materials (marine shell and animal bone), artifacts, and basalt, decomposing basalt, and coral (Table 19). Photos of representative materials and traditional Hawaiian artifacts are provided below (Figure 78 through Figure 83).

The abundance of roots and rootlets, light fraction (276.9 g) and heavy fraction (9.2 g), and root casts (43.1 g), would be expected within an irrigated pond-field (*lo‘i*) environment. The organic content and presence of charcoal, faunal remains, and artifacts suggests the project area was utilized for traditional Hawaiian agriculture.

Further scientific analysis (radiocarbon dating, pollen analysis, etc.) of collected field samples was determined to not be appropriate for the current investigation. Only very sparse and dispersed charcoal flecking in a non-discrete context, rather than within distinct features, was observed. Although no historic material was found within analyzed sediments collected from SIHP # -7151, historic maps (see Figure 17) indicate that at least portions of the site were utilized historically. It should be noted that oil contamination was found within the Trench 7, Stratum III bulk sample. This contamination could have an effect on certain scientific analyses. However, two column samples, collected from Trench 4 and Trench 9, have been retained for potential scientific analysis if deemed appropriate in the future.

Table 18. Table Listing Artifacts Found During Analysis of Bulk Sediment Samples

Acc. #	Trench	Strat	Depth (cmbs)	Material	Object	Function	# pcs.	Size (cm)	Weight (g)	Comments
1	5	III	85-155	Volcanic Glass	Flake	Trad. Hwn. Artifact	1	0.8L/ 0.6W/ 0.1Th	0.1	
2	5	III	85-155	Basalt	Ground Stone Tool Fragment	Trad. Hwn. Artifact	1	1.3L/ 0.7W/ 0.3Th	0.2	likely adze fragment
3	10	II	85-100	Metal	Ferrous Metal Fragment	Unknown	1	0.6L/ 0.7W/ 0.1Th	<0.1	

Table 19. Table Listing Materials Recovered During Analysis of Bulk Sediment Samples

Bulk Sample Analysis				Organic Material									Faunal		Artifacts			Miscellaneous		
Trench	Stratum	Depth (cmbs)	Weight (g)	Light Fraction Roots	Heavy Fraction Roots	Root Casts	Charcoal	Unk. Seeds	Kukui	Poss. Gourd	Unk. Organic	Marine shell	Faunal bone	Volcanic glass	Ground stone tool fragment	Metal fragment	Basalt	Decomposing Basalt	Coral
1	IV	100-120	300	12.6	0.2														
1	V	115-180	1900				0.8										<0.1		
2	IV	140-165	3050	67.7	4												50.4		1.1
2	V	165-245	1500	12.5		0.2						<0.1					4.9		1.4
3	III	120-155	2850	46.4		11.7		0.1											
3	IV	155-190	2300	2	0.3	0.3	<0.1											261	<0.1
4	III	135-173	3800	27.2															0.4
5	III	85-155	3850	21.6	4.7		1		2.6	0.6	3.7		26.4	0.1	0.2		876		1.7
7	III	63-73	2200	2.7													8.8		
9	III	95-160	2500	63.5		13	<0.1											142	
10	II	85-100	500	0.8												<.01		5.6	
10	III	130-145	2150	19.9													6.7		
10	IV	140-200	1800	<0.1		17.9													
TOTAL			28700	276.9	9.2	43.1	1.8	0.1	2.6	0.6	3.7	<0.1	26.4	0.1	0.2	<0.1	947	408	4.6

Figure 76. Photo of representative light fraction material, recovered from Trench 4, Stratum III

Figure 77. Photo of representative heavy fraction material, recovered from Trench 5, Stratum III

Figure 78. Photo of root casts from Trench 2, Stratum V

Figure 79. Photo of root casts from Trench 10, Stratum IV

Figure 80. Photo of *kukui* and organic materials recovered from Trench 5, Stratum III

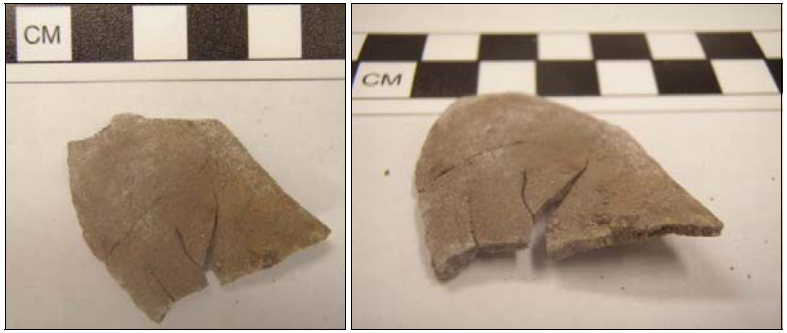

Figure 81. Photo of a possible gourd fragment recovered from Trench 5, Stratum III; left (top view), right (side view)

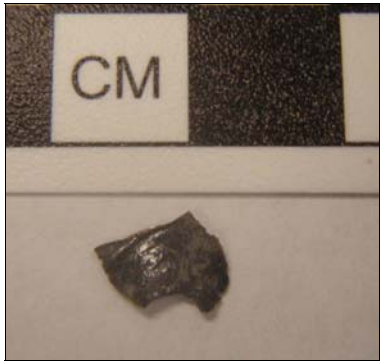

Figure 82. Photo of Acc. #1, volcanic glass flake, recovered from Trench 5, Stratum III, SIHP # -7151

Figure 83. Photo of Acc. #2, ground stone tool fragment, recovered from Trench 5, Stratum III. SIHP # -7151, left (top view) and right (view of bottom)

Section 8 Summary and Interpretation

At the request of Group 70 International, Inc. (924 Bethel St, Honolulu), Cultural Surveys Hawai‘i, Inc., (CSH) conducted an archaeological inventory survey for the Hale’iwa Redevelopment Entitlements Project, Kawailoa Ahupua‘a, Waialua District, O‘ahu, TMK: [1] 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028 & 032. Based on background research, the project area is located within an area once heavily populated and lush in natural and cultural resources including abundant water sources, fishponds, and agricultural land.

On October 29, 2010, Cultural Surveys Hawai‘i (CSH) conducted a surface survey of the project area. Five significant historic structures were documented within the project area, fronting Kamehameha Highway: the M. Yoshida Store-North (now Hale‘iwa Eats), built in 1923; the M. Yoshida Store-South (now Global Creations Art Gallery), built in 1923; the Matsumoto Store (also called Matsumoto’s Shave Ice), built in 1904; Aoki’s Shave Ice, built in 1931; and, the ‘Iwa Gallery, built in 1931. These structures are currently listed as significant historic structures within the Hale‘iwa Special District boundary. Additionally a branch church for the House of Restoration, Assemblies of God, which was founded in 1957 is located within the project area along Kamehameha Highway. Since this structure is now older than 50 years an architectural significance assessment will be discussed with the SHPD.

Five concrete foundations (A-E) were documented to the west of the standing historic buildings along Kamehameha Highway. The function of the majority of these foundations is unknown. The foundations are currently being used as locations for stockpiling commercial equipment. These foundations have been assigned State Inventory of Historic Places (SIHP) No. 50-80-04-7152.

On November 23, 2010 and March 9, 2011, CSH conducted a subsurface testing program consisting of the excavation of 10 trenches placed throughout the project area. Subsurface investigations indicated relatively consistent stratigraphy throughout the project area. Silty clay sediments indicative of an agricultural *lo‘i* deposit (SIHP # 50-80-04-7151) were documented in nine trenches (Trenches 1-7, 9, and 10) located in the west half of the project area. In general, the agricultural sediment contained abundant organic materials and two traditional Hawaiian artifacts (Acc. #’s 1 and 2) including a volcanic glass flake (Acc. #1) and a basalt ground stone tool fragment (Acc. #2).

Due to the presence of historic buildings and foundations, subsurface *lo‘i* agricultural sediments, and the lack of previous disturbance throughout the west half of the project area, it is likely that pre- and post- contact cultural materials and/or intact subsurface features may be encountered during construction activities related to the proposed project.

Section 9 Significance Assessments

The inventory survey investigation and documentation of the project area’s historic properties has provided sufficient information for significance evaluations. Significance is determined after evaluation of the historic property in light of the five broad criteria used by the Hawai‘i State Register of Historic Places (Hawai‘i Register) (HAR 13-284-6). The criteria are the following:

A	Historic property reflects major trends or events in the history of the state or nation.
B	Historic property is associated with the lives of persons significant in our past.
C	Historic property is an excellent example of a site type.
D	Historic property has yielded or may be likely to yield information important in prehistory or history.
E	Historic property has cultural significance to an ethnic group, including, but not limited to, religious structures, burials, and traditional cultural properties.

9.1 SIHP #50-80-04-7151

SIHP # 50-80-04-7151, irrigated pond-field (*lo‘i*) agricultural sediment, is significant based on criterion D.

9.2 SIHP # 50-80-04-7152

SIHP # 50-80-04-7152, historic concrete foundations, is significant based on criterion D.

Section 10 Project Effect and Mitigation Recommendation

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.

10.1 Project Effect

The proposed project will adversely affect historic properties determined as significant under criteria of the Hawai‘i Register (see Figure 5 and Figure 40). Therefore, in consultation with the land owner, CSH's project specific effect recommendation is "effect, with agreed upon mitigation measures." The recommended mitigation measures will reduce the project's effect on yet to be identified subsurface historic properties that may be located within the survey area and be pro-active in addressing possible community concerns. It is likely that project-related utilities will adversely impact SIHP # -7151 (*lo‘i* sediment). The proposed parking lot area will likely adversely impact SIHP # -7152 (concrete foundations).

10.2 Mitigation Recommendations

The inventory survey's recommended mitigation measures for SIHP # 50-80-04-7151 and -7152 include archaeological monitoring. No further historic preservation work, other than mitigation in the form of archaeological monitoring, is recommended for SIHP #'s 50-80-04-7151 and -7152. 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.

10.2.1 Archaeological Monitoring

Due to the inherent limitations of any sampling strategy, it is possible that additional historic properties or features, potentially including human burials and non-burial archaeological deposits, may be uncovered during construction activities. In order to mitigate the potential damage to the known documented historic properties or any yet unidentified archeological features within the project area, the project development should proceed under an archaeological monitoring program. An archaeological monitoring program would facilitate the identification and treatment of any burials and/or non-burial archaeological deposits, including SIHP #'s -7151 and -7152, that might be discovered during project construction. The monitoring program would also provide further information on the distribution and nature of the sites documented during this investigation.

The specifics of the monitoring work will be specified within an Archaeological Monitoring Plan for the review and approval of the SHPD prior to project construction.

10.2.2 Disposition of Materials

The collected and analyzed materials associated with this archaeological inventory survey were collected from private lands; accordingly, this material belongs to the landowner, Kamehameha Schools Bishop Estate. The materials will be temporarily housed at the CSH

storage facility until further arrangements are made with the landowner. Should the landowner request different archiving of material, then the archive location will be determined in consultation with SHPD.

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Appendix A Land Commission Awards

No. 2907, Keawe, wahine, Waialua, January 5, 1848
N.R. 688v3

To the Land Commissioners, Greetings: I hereby state my claim at Ou, Kawailoa kai. This claim of mine was from Kaoo. There are nine lo‘i and also a watercourse, and my house is on this land The boundaries are as follows: north, Kawelu's lo‘is, east, Helumoa, south, Kalua-lepo, west, Kalualepo and the lo‘is of Kahakai and of Kalua. I also have some lo‘is and a pali wauke at Kawailoa waena, bounded as follows: north; a pali, east, Kuokoa, south, Lohi's /land/, west, Kaaeawa's /land/.

I desire to have an award document to protect these lands.

KEAWE X

F.T.519v11
No. 2907, Keawe Wahine

Ua hoohikiia o L. Kuokoa, Ua ike au elua apana aina aia m aka ili o Ou ma Kawailoa

Eha loi a me kahi kula
Mauka, Helumoa loi
Waianae, aina o Pueo
Makai, aina o Keliihuluhulu
Koolauloa, aina o Kawelu

Apana 2. Ainaiki moa moo 2 loi
Mauka, aina o Kahulupueo o Ou ka inoa
Waianae, aina o Pueo
Makai, aina o Koaiawa o Kaioulaula ka inoa
Koolauloa, kula o Kahakai

Ua loaa mai na makua mai a hooili mai ia ia ia Kamehameha I, aole mea keakea ia ia

Hoike 2. Kekahuna, Ua ike au e like me ko L. Kuokoa ike

F.T. 519v11
No. 2907 Keawe wahine /a woman/

L. Kuokoa sworn: I know of two apanas of land in the ‘ili of Ou, in Kawlailoa ahupua‘a. There are four lo‘i and a kula.

Mauka, Helumoa lo‘I
Waianae, land of Pueo
Makai, land of Keliihuluhulu
Koolaupoko, land of Kawelo.

Apana 2. Ainaiki mo‘o, 2 lo‘i.
Mauka, land of Kahulupue, named Ou
Waianae, land of Pueo
Makai, land of Kaaiawa, named Kaiaulaula
Koolaupoko, kula of Kahakai.

It was inherited from the parents in the time of Kamehameha I. No one has disputed her.

Witness 2. Kahuna, My knowledge of it is the same as L. Kuokoa's.

[Award 2907; R.P. 1460; Kawailoa Waialua; 1 ap.; 2 Acs; Keokea Kawailoa Waialua; 1 ap.; .52 Ac.; Ukoa Kawailoa Waialua; 1 ap.; .88 Ac.]

No. 2692, Luahiwa
N.R. 549v3

To the Land Commissioners, I, the one whose name is below, hereby state my claim for land which is on the north of Waikalua. Its boundaries are: on the north, the land of Piikoi, on the east, a pali, on the south, the land of Nakahu, on the west, the sea. Also there is my claim for a kula where sweet potato is cultivated, adjoining Nuupia on the south. Also, there are 3 at Koakoa. This land was gotten in the time of the publishing of the law.

LUAHIWA

Kaneohe, Oahu, December 18, 1847

F.T. 474v11
No. 2547, Luahiwa
[No. 2547 not awarded]

Kealohua, hoohikiia, Ua ike au i kona mau aina 9 loi ma Mooiki, Kawailua, ma Waialua, Oahu.

Mauka, Ili o Lokoea
Waianae, aina o Kahokokai
Makai, konohikilau moo
Kooalupoko, aina loi o Kaohe.

No Kahalau mai kona aina i na la o Kinau. Aole mea keakea.

Kalaeina, hoohikiia, Ua like ke maua ike me ko Kealohua.

N.T. 178v10
No. 2692, Luahiva

(from page 474, Vol. 11 part 2), 24 September 1852, (NS-?2547)

L. Kuokoa, the assistant konohiki, had objected to Luahiwa's claim and today Lua-hiwa and Lamaulu (who had owned the claim at the time for the konohiki) has come here.

Lamaulu - Section 2 of Luahiwa's claim was given to him by me in 1842 and they have farmed continuously to this time, I have not offered any oppositions. I had included in Luahiwa's claim under the konohiki, section 3 which is a ditch.

L. Kuokoa - I have stopped obJecting because the objection was for Lamaulu's side and he had given as he desired.

Decision : Section 2 is for Luahiwa, section 3 shall be for Lamaulu under the konohiki and Luahiwa and Lamaulu have both agreed.

[Award 2692; R.P. 3418; Anahulu Kawailoa Waialua; 4 ap.; 1.18 Acs]

No. 2748, Naahuelua, Wailaua, January 1, 1849
N.R. 618-619v3

To the Land Commissioners: I hereby state my claim. 1. Kolea, Kawailoa kai, six lo‘i and the watercourse, I have held this claim for 20 years.

It was from Kahalau, and is bounded as follows: North Kamaikole, east Punahoalapa, south a watercourse for Kiha, north Hawaii's and Naukana's /lands/.

2. Kapiheakamalii, Kawailoa kai, six lo‘i and a kula, which I have had for 24 years. I got this land from Kaoo. It is bounded on the north by the land of G. Laanui, on the east by a road, and Anahulu, on the south by Helumoa, and Kawakamana ma's houses, on the west by Kalamakea's and Lamalu's /lands/.

3. A sweet potato garden is in the lot of Nauahi ma, however, no one has dissented to my claim, therefore I wish to have an award document to protect it for myself.

4. I also have a house lot at Puaena, Kawailoa kai.

NAAHUELUA

F.T. 480v11
No. 2748, Naahuelua

L. Kuokoa, hoohikiia, Ua ike au i kona aina ma keia mau ili o Kawailoa, ma Waialua. Ua make o Naahuelua, o kana wahine o Hualalai kona hooilina.

Apana 1. 3 loi me 2 pauku auwai ili of Kolea.
Apana 2. 6 loi me ke kua. Moo Kapiheakamalii ma ka ili o Koheo.
Apana 3. Kuleana ma ka pa uala.

Apana 1:
Mauka, loko o Punahoolapa
Waianae, aina o Namanu
Makai, aina o Kaamau
Honolulu, aina o Nakahuahale ili Kaaimakole.

Apana 2:
Mauka, Loi poalima Helumoa
Waianae, aina o Koheoiki
Makai, aina o Kekauwa
Honolulu, pa o Hokuaulani me ko Laanui.

No Kahalau mai i ka wa o Kaahumanu I, aole mea keakea.

F.T. 480v11
No. 2748, Naahuelua

L. Kuokoa, sworn, I know his land in these ‘ilis of Kawailoa, ln Waialua. Naahuelua is dead and his wife, Hualalai is his heir.

Apana 1. 3 lo‘i and 2 sections of watercourse, ‘ili of Kolea.
Apana 2. 6 lo‘i and the kula, Mo‘o Kapiheakamalii in the ‘ili of Koheo.
Apana 3. Communal right in the sweet potato lot.

Apana 1:
Mauka, pond of Punahoolapa
Waianae, land of Namanu
Makai, land of Kaamau
Koolaupoko, land of Nakahuahale, ‘ili Kaaimakole.

Apana 2:
Mauka, lo‘i po‘alima Helumoa
Waianae, land of Koheoiki
Makai, land of Kekauwa
Koolaupoko, lot of Hokuaulani and of Laanui.

It was from Kahalau in the time of Kaahumanu I, and is undisputed.

[Award 2748; R.P. 6389; Kawailoa kai Waialua; .92 Acre; Kapihi o Kamalii, .84 Acre; Ukoa Kawailoa Waialua; 1 ap.; 4.5 Acres]

No. 2926, Kahakai, Waialua, January 4, 1848
N.R. 696v3

To the Land Commissioners: I, Kahakai, hereby explain my claim for land. I have a claim from my makuas, and before the time of Kamehameha I.

The first is Kohoo, Kawailoa kai, with two lo‘i and the kula, surrounded by the lo‘is of Kalua and of Kauwa ma.

The second is Oio, two lo‘i, with a loko ‘ai /pond for taro and fish/[loko ‘ia?], between them.
The third is Ainaiki, with one lo‘i, surrounded by the lo‘is of Kaalawa and of Kahulapue.
The fourth is Keae, my pali wauke, on the west of Keae.
The fifth is Pahui, one mala of gourd, one mala of sweet potato.

The sixth is my little house site which is in the lot of Nauahi. This is a right as a tenant. The right to/ the fish are: ‘o‘opu /gobey/, ‘opae /fresh water shrimp/, limu kala /a surgeon fish/, and certain fish to which there is a right at the time when they can be caught, such as the ‘anae /full-sized mullet/.

There remains the award document to be gotten.

KAHAKAI X, his mark

F.T. 513v11
No. 2926, Kahakai

Makuaeu, hoohikiia, Ua ike au i keia mau aina ekolu ma Kawailoa, Koheoiki moo ma ka ili o Koheo, i Kawailoa. Elua loi me kahi Auwai.

Mauka, Kaniui hele a hiki i ko akou wahi
Waianae, Paula,
Makai, Koheonui ko ke Kauwa aina
Koolaupoko, ko Lumaulu aina.

Apana 2. Pahui a Ukoa, Elua Ili uala.
Kahuahale 3. He wahi hui e Nauahi a me Olopana ma.

Mauka, Ko Olopana hale
Waianae, ke alanui
Makai, Ukoa
Koolauloa, ko Nauahi hale.

Ua loaa ia ia keia mau aina mai na makua mai, aole mea keakea mai i keia mau aina.

Ua, hoohikiia o Kuokoa, Ua like keia ike me ko Makuaeu ike.

F.T. 513v11
No. 2926, Kahakai

Makuaeu, sworn, I know his three lands in Kawailoa Ahunua‘a, Koheoiki mo‘o in the ‘ili of Koheo. Two lo‘i and a water course.

Mauka, road which comes to our place
Waianae, Paula
Makai, Koheonui, Kekauwa's land
Koolaupoko, Lumaulu's land.

Apana 2. Communal lot at Ukoa, two areas planted in sweet potato.

3. House lot. A place combined with Nauahi and Olopana ma.
Muka, Olopana's house
Waianae, the road
Makai, Ukoa
Koolaupoko, Nauahi's house.

He received these lands from his parents and they are undisputed.

Kuokoa was, sworn, my knowledge of it is the same as Makuaeu's.

[Award 2926; R.P. 1474; Kawailoa Waialua; 1 ap.; .39 Ac.; Ukoa Kawailoa Waialua; 3 ap.; 2.76 Acs]

No. 7408, Kawahamana, Waialua, January 29, 1848
N.R. 327-328v5

A letter petitioning you, the Land Commissioners: I have a claim for land, from the time of Kahalau; my makuas had the land at that time. When Kahalau was finished on the land, it was transferred to Kekauwa, then my makuas were done occupying the land and it was transferred to me, until the present. Therefore I have the claim to this land at Kawailoa kai. It is bounded on the north and south by Kahakai's land, on the east by a house lot, on the west by Luahiwa's land.

Another claim is for one lo‘i, from Kekauwa, therefore I desire to combine this lo‘i with my land claim. It is bounded on the north by a weed-grown lo‘i, on the east by a watercourse, on the south by Kalei's land, on the north by Kekauwa's land.

Therefore, I desire to have the Award Document from you,

KAWAHAMANA

F.T. 468v11
No. 7408, Kawahamana

Maaweiki, hoohikiia, Ua ike au i kona mau aina. Elua mau apana ma keia mau aina malalo nei, Kawailoa, Waialua, Oahu.

Apana 1. 1 loi moo Kapaula Ili o Koheo & pahale
Apana 2. 1 loi moo Kapaula Ili o Koheo.

Apana 1:
Mauka, loi o Helumoa
Waianae, Ili o Ou
Makai, aina o Kekaua
Koolaupoko, aina o Kahakai.

Apana 2:
Mauka, aina o Luahiwa
Waianae, aina o Kalei
Makai, aina o Kekauwa
Koolaupoko, aina o Kekauwa.

Mai na makua i ka wa o Kamehameha I. Aole mea keakea.

Nakahuahale, hoohikiia, Ua like ko maua ike me ko Maaweiki.

[Award 7408; R.P. 2642; Kawailoa Waialua, 2 ap.; .78 Ac.]

No. 9951, Laanui
N.R. 494-496v4

To the Honorable Land Commissioners: I, G. Laanui, am a claimant of land at Kawailoa, in Waialua on Oahu. Kawailoa is the name of my land, from the upland to the sea, from that side to this side, and two 'ili at Paalaa, and six 'ili at Kamananui. The names of the 'ili at Paalaa are Laukihaa and Waikaalulu, and at Kamananui they are Kalehunui, Kamahu, Kalaopa, Kamahu 2, Kamahu 3 and Kuanopill. These are my 'ilis in these Lands. Two lands, however, are mea kai /fisherles/, Kalaopa and Kalehunui. The origin of my right to the land in Waialua is from my wahine, Kuaipiia, and I have become a genuine kama'aina of this place, as though native-born of several generations of ancestors. When Kekuaipiia dwelt in Waialua, Ukoa was her original 'ili and at Kamananul she had the 'ili of Kalopa, she had the two. Kaahumanu asked Keeaumoku for Lokoea and Keeaumoku consented, and Piia gave me Ukoa and Lokoea and Kalopa in Kamananui. Keeaumoku died in 1824, and then Kaahumanu gave Waialua to Piia, from cape to cape, however, she truly controlled Kawailoa from the sea to the mountain and from this side to that side, yet, lt had no ku. Piia said to me, "Your land is Kawailoa, from the sea to the mountain, and from that side to this side; there is no ku within it"

The right was to be mine, and the two 'ili at Paalaa and the six 'ili at Kamananui, also, Ukoa and Lokoea are included within my Ahupua'a of Kawailoa. Thus said Piia to me. Kekuaipiia, my wahine who had settled me at Waialua, died in 1829, and Kaahumanu said to me, "Your wahine has died, and you are my kaikaina - you shall live in our house and my lands, which are yours from your wahine, shall be yours as in her bequest. Kaahumanu died in 1832, and Kinau said to me, "You return to Waialua to live - you shall be for me - you return as luna of the land you occupy - your lands from your wahines shall be yours." Thus said Kinau to me. Kinau died in 1839, and my lands have been held firmly from the three of them - two makuahine and one kaikamahine, and they are my right to the land and house lot, until this very time of Victoria Kamamalu, her kaikamahine - thus it has been, Therefore, I hereby request you, the Land Commissioners, to give me an award document for my lands and house lots.

G. LAANUI

F.T. 462-464v11
No. 9951, G. Laanui

L. Kuokoa, hoohikiia, Ua ike au i kona mau kuleana a pau ma keia mau ili of Waialua nei.

Apana 1. Ili o Kalaopa ma Kamananui.
Apana 2. Ili o Kalehunui.
Apana 3, Ili o Kamahu 1.
Apana 4, Ili o Kamahu 2.
Apana 5. Ili o Kamahu 3.
Apana 6. Ili o Kuanopili.
Apana 7. Ili o Laukihaa ma Paalaa.
Apana 8. Ili o Waikaalulu ma Paalaa.
Apana 9. Ahupuaa o Kawailoa.

Ua loaa mai keia mau kuleana ia ia maluna, mai a Piia, mai a Kaahumanu I, a mu Kinau, a e noho aku no malalo o Victoria Kamamalu. O kona mau kuleana ponoi maoli. Eia no.

Apana 1. Pahale a me ka loi 1.
Apana 2. 1 loi ma Kanenelu.
Apana 3. 1 loi, Kaaleo o Anahululuna.
Apana 4. Pahale o Poula ili o Koheo.
Apana 5. 1 loi o Kaluaokelea, Anahulu.
Apana 6. 1 loi o Kaoao ma Anahulu.
Apana 7. 2 loi o Kaluaakuawa, Kauhiwai ili.

Apana 1:
Mauka, loi koele, Kumukukui
Waianae, loi Kapiheakamalii
Makai, pahale o Hokuaulani
Koolaupoko, pa aina.

Apana 2:
Mauka, loi o Kahea
Waianae, alanui aupuni
Makai, loi koele, Keokea
Koolaupoko, loi o Kalauli.

Apana 3:
Mauka, Anahulu loi
Waianae, loi o Kahea
Makai, he mau loi, Kaipuakaiole
Koolaupoko, loi o Kuaipaihi.

Apana 4:
Mauka, loi o Helumoa
Waianae, Ili o Ou
Makai, loi o Koheoiki
Koolaupoko, pahale o Kalua.

Apana 5:
Mauka, loi o Kamahalo
Waianae, loi o Kuaipaihi
Makai, loi o Kuaipaihi
Koolaupoko, Muliwai o Anahulu.

Apana 6:
Mauka, loi o Kapuhi
Waianae, pahale o Puhi
Makai, Alanui aupuni
Koolaupoko, Muliwai o Anahulu.

Apana 7:
Mauka, moo o Hanakapuka
Waianae, Pali

Makai, 3 loi o Kahauhau
Koolaupoko, kahawai o Anahulu

Aole mea keakea i keia mau apana 7 mai a Piia mai a hiki i kona make ana. Mai kona make ana a hiki i anei. Ekolu malama.

F.T. 462-464v11 Translation
No. 9951, G. Laanui

L. Kuokoa, sworn, I know his entire claim in these 'ilis of Waialua.

Apana 1. 'Ili of Kalaopa in Kamananui.
Apana 2. 'Ili of Kalehunui.
Apana 3, 'Ili of Kamahu 1.
Apana 4, 'Ili of Kamahu 2.
Apana 5. 'Ili of Kamahu 3.
Apana 6. 'Ili of Kuanopili.
Apana 7. 'Ili of Laukihaa in Paalaa.
Apana 8. 'Ili of Waikaalulu in Paalaa.
Apana 9. Ahupua'a of Kawailoa.

He received these claims from Piia, from Kaahumanu I, and from Kinau, and is living under Victoria Kamamalu. These are his own genuine claims, as follows:

Apana 1. House lot and 1 lo'i.
Apana 2. 1 lo'i at Kanenelu.
Apana 3. 1 lo'i, Kaaleo, Anahululuna.
Apana 4. House lot of Poula, 'ili of Koheo.
Apana 5. 1 lo'i, Kaluaokelea, Anahulu.
Apana 6. 1 lo'i, Kaoao, at Anahulu.
Apana 7. 2 lo'i, Kaluaakuawa, Kauhiwai ‘ili.

Apana 1:
Mauka by lo'i ko'ele, Kumukukui
Waianae by lo'i Kapiheakamalii
Makai by House lot of Hokuaulani
Koolaupoko by Land boundary wall.

Apana 2:
Mauka lo'i of Kahea
Waianae by Government Road
Makai by lo'i ko'ele, Keokea
Koolaupoko by lo'i of Kalauli.

Apana 3:
Mauka by Anahulu lo'i
Waianae by lo'i of Kahea
Makai by some lo'is, Kaipuakaiole
Koolaupoko by lo'i of Kuaipaihi.

Apana 4:
Mauka by lo'i of Helumoa
Waianae by 'Ili of Ou
Makai by lo'i of Koheoiki
Koolaupoko by House lot of Kalua.

Apana 5:
Mauka by lo'i of Kamahalo
Waianae by lo'i of Kuaipaihi
Makai by lo'i of Kuaipaihi
Koolaupoko by Muliwai of Anahulu.

Apana 6:
Mauka by lo'i of Kapuhi
Waianae by house lot of Puhi
Makai by Government Road
Koolaupoko by Muliwai of Anahulu.

Apana 7:
Mauka by mo'o of Hanakapuka
Waianae by Pali, Makai by 3 lo'i of Kahauhau
Koolaupoko by Anahulu Stream.

These seven apana from Piia were undisputed until his death. From his death until now /it has been three months/.

[Award 9951; R.P. 6296; Kawailoa Waialua; 8 ap.; 8.0 Acs]

Appendix G
CULTURAL IMPACT ASSESSMENT REPORT

Cultural Impact Assessment for the Hale‘iwa Redevelopment Entitlements Project, Kawailoa Ahupua‘a, Waialua District, O‘ahu

TMK: [1] 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028 & 032

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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. However, translations of Hawaiian and other non-English words for plants and animals mentioned by community participants are referenced separately (see explanation below).

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 of plants and animals appear as in the original texts.

Abbreviations

APE	Area of Potential Effect
CIA	Cultural Impact Assessment
CSH	Cultural Surveys Hawai‘i
DLNR	Department of Land and Natural Resources
DOH/OEQC	Department of Health/Office of Environmental Quality Control
GLA	Gross Leasable Area
HAR	Hawai‘i Administrative Rules
HRS	Hawai‘i Revised Statutes
LCA	Land Commission Award
OHA	Office of Hawaiian Affairs
OIBC	O‘ahu Island Burial Council
SHPD	State Historic Preservation Division
TCP	Traditional Cultural Property
TMK	Tax Map Key
USGS	United States Geological Survey

Management Summary

Reference	Cultural Impact Assessment for Hale‘iwa Redevelopment Entitlements Project, Kawailoa Ahupua‘a, Waialua District, O‘ahu on a 4.22-acre Project area in TMK: [1] 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028 & 032.
Date	February 2011
Project Number (s)	Cultural Surveys Hawai‘i job code PAALAA 2
Project Location	The Project site is bordered by retail stores to the north, Kamehameha Highway to the east, Hale‘iwa Town Center to the south, and agricultural lands to the west. The neighborhoods surrounding the Project site consist primarily of low-rise residential and low-rise commercial structures.
Land Jurisdiction	The Project area is privately owned.
Agencies	State of Hawai‘i Department of Land and Natural Resources/State Historic Preservation Division (DLNR/SHPD); State Office of Environmental Quality Control (OEQC).
Project Description	Kamehameha Schools (KS) is proposing to redevelop its commercial properties located in Hale‘iwa along Kamehameha Highway from Mahaulu Lane to Kewalo Lane. These properties include the popular Matsumoto Shave Ice business. The intent of this redevelopment Project is to revitalize existing businesses and provide essential infrastructure, while retaining the rural scale and plantation character of the Hale‘iwa Special District. The redevelopment will expand existing retail frontage with a combination of new in-line storefronts and preservation or reconstruction of selected historic buildings. The Project will also increase pedestrian pathways and safety, provide a central gathering place, and improve traffic flow with a newly constructed rear parking lot. The existing properties support approximately 14,000 square-feet of Gross Leasable Area (GLA), while the final build-out of the proposed redevelopment will provide up to 30,000 SF of GLA.
Project Acreage	4.22 acres
Area of Potential Effect (APE) and Survey Acreage	The Area of Potential Effect (APE) for this Cultural Impact Assessment (CIA) includes the 4.22-acre Project area in the context of Kawailoa Ahupua‘a, Waialua District, O‘ahu and other places on O‘ahu and beyond (e.g., Kaua‘i Island) that are or may be traditionally associated with or connected to the Project area.

Document Purpose	The Project requires compliance with the State of Hawai‘i environmental review process (Hawai‘i Revised Statutes [HRS] Chapter 343), which requires consideration of a proposed Project’s effect on cultural practices and resources. At the request of Group 70 International, Inc., CSH produced this CIA. Through document research and cultural consultation efforts, this report provides preliminary information pertinent to the assessment of the proposed Project’s impacts to cultural practices and resources (per the Office of Environmental Quality Control’s Guidelines for Assessing Cultural Impacts) which may include Traditional Cultural Properties (TCP) of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places, in accordance with Hawai‘i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria (HAR §13-284) under Criterion E. The document is intended to support the Project’s environmental review and may also serve to support the Project’s historic preservation review under HRS Chapter 6E-42 and Hawai‘i Administrative Rules (HAR) Chapter 13-284.
Community Consultation	Hawaiian organizations, agencies and community members were contacted in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the Project area and the vicinity. The organizations consulted included the State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs (OHA), and the O‘ahu Island Burial Council (OIBC).
Results of Background Research	Background research for this Project yielded the following results (presented in approximate chronological order): 1. The Project is located in Waialua district’s Hale‘iwa Town which is divided between Kawailoa Ahupua‘a and Pa‘ala‘a Ahupua‘a. The Project footprint is within the *makai* (seaward) portion of Kawailoa Ahupua‘a and in direct proximity to the *makai* (seaward) portion of Pa‘ala‘a Ahupua‘a. This area was part of the rich taro lands that were located near the coast in the *ahupua‘a* (land division usually extending from the uplands to the sea) of Pa‘ala‘a and Kawailoa, on the eastern end of Waialua district. Unlike most *ahupua‘a*, the boundary between these two areas does not follow the contours of the land, but rather seems to have been drawn to share the rich taro lands between these *ahupua‘a*. In historic maps, the boundaries of the Project site are designated in Pa‘ala‘a. For example, in an 1883 map entitled the “Konohiki Lands in Paalaa” (Figure 9), the former taro lands west of the Anahulu River (which appears to include the Project aera) are designated as part of “Pa‘ala‘a Lands.” In 1915 “Pa‘ala‘a Kai Subdivision” was built in this

	area (Podmore 1915), and the surrounding area today (including the Project area) is often referred to by the same name, although it is within the *ahupua‘a* of Kawailoa according to both OHA and USGS current *ahupua‘a* boudaries. Even though the Project area is within the boundaries of Kawailoa Ahupua‘a, much of the history of the Project area is more closely aligned with the sense of place in Pa‘ala‘a and the town of Haleiwa. For these reasons, the background section of this report includes aspects of both Pa‘ala‘a and Kawailoa Ahupua‘a. 2. The district of Waialua is rich in legends, stories, proverbs, and myths. According to one tradition, Waialua means “two waters” which refers to two large stream drainages (Anahulu and Helemano-Poamoho-Kaukonahua) that once irrigated extensive taro fields in the *ahupua‘a* of Kamananui, Pa‘ala‘a, and Kawailoa. 3. The area surrounding the Project site is rich with cultural features, which indicate that the Kawailoa and Pa‘ala‘a Ahupua‘a were significant in pre-Contact O‘ahu. In the 1930s, Gerald McAllister of the Bishop Museum, recorded sites in Pa‘ala‘a, comprised of the *heiau* (place of worship) of Kamani, Kapukapuākea, Lonoakeahu, Pu‘upilo, Kepuwai, and Hekili, the altars of Punakai and Kumailia unu, the ko‘a (fishing shrine) of Ka‘ohe, the Pōhaku Lana‘i at Kaiaka Point, Kūpaoa Point, a kahuna’s (priest) residence called Punakai, the site of Pā‘aikana enclosure in Halemano, and Laukī‘aha Spring (McAllister: 1933, 132-43). 4. Well-known traditional accounts associated with the area include the chief Lo-Lale and his wife Kelea. Lo-Lale was the brother of the high chief of O‘ahu Piliwale, whose court was established at Waialua. Piliwale desired that his brother marry in order to strengthen their court. Kalonaiki, their mother had married Kikinui and “thus infused into the family the native and aristocratic blood of Maweke, of the ancient line of Nanaula”. (Kalakaua, 1990: 232) Lo-Lale’s cousin Kalamakua embarked on a quest to find a wife, he returned with Kelea, sister to the Kawao Mō‘ī of Māui. Although this union did not last the couple had three children, one of whom Kaholi married his cousin, Kohipa, the daughter of Piliwale and sister to his successor Kukaniloko. Kelea married Kalamakua the aforementioned cousin of Lo-Lale. Together they had one daughter Laielohelohe who later became the wife of Piilani.

(Kalakaua, 1990:228-246) Another account associated with the area include the cannibal chief ‘Aikanaka (lit. “cannibal”, “man-eater”) of Pa‘ala‘a Ahupua‘a. The many sources for this story attest to its notoriety. The gist of the story relates that (perhaps circa A.D. 1750), a powerful wrestler and boxer, often said to have been a foreigner, retired with a few followers in the uplands of Pa‘ala‘a where they dined on the flesh of hapless travelers until the leader was killed by the brother of a victim. McAllister (1933) placed the area known as the Pā ‘Aikanaka (“Man-eater’s enclosure”) eight miles east of Hale‘iwa but noted that nothing remained. Another well-known *mo'olelo* (story) is that of Laniwahine, who took various forms as a *mo'o* (lizard) and a woman as the guardian of 'Uko'a Pond at Waialua.

5. The Project site is in proximity to Kaiaka (“shadowed sea”) Point on Kaiaka Bay toward the western side of Waialua Bay. Kaiaka Point was the site for a large balancing rock, or *pōhaku*, called Pohaku o Lanai. The point near the northern coastal boundary of Pa‘ala‘a was called Kūpaoa (“strong permeating fragrance”).

6. The history of Kawailoa and Pa‘ala‘a Ahupua‘a must also be viewed in the wider context of the Waialua District. 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 Hawaiian Islands.

7. In approximately A.D. 1310 (a time estimate based on an average length of generational intervals in chiefly geneaologies), Maweke partitioned O'ahu into three districts: Kona, the 'Ewa, Wai'anae, and Waialua region, and the windward Ko'olau region. Then, in approximately A.D. 1490, the *'aha ali'i* (council of chiefs) chose Ma'ilikukahi, an *ali'i kapu* who was born at Kukaniloko, to be the new *ali'i nui* (paramount chief) of O'ahu. After his paramountship was installed at the *heiau* of Kapukapuakea (Site 225; McAllister 1933:140) in central Waialua, Ma'ilikukahi instituted an explicit land division and administration structure: O'ahu was divided into six *moku* (districts): Kona, 'Ewa, Wai'anae, Waialua, Ko'olauloa, and Ko'olaupoko-that were further divided into 86 *ahupua'a* and smaller territorial units (Kirch 2010:84-90).

8. The chiefly rank Lo is known as the chiefs of Lihue, Wahiawa and Halemano on Oahu, they were called Lo chiefs or po‘e Lo Ali‘i {“people from whom to obtain a chief”}.They were known to live in the mountain areas and were admired for their strict adherence to the kapus associated with their rank. “. . if a kingdom was without a chief, there in the mountains could be found a high chief (ali‘i nui) for the kingdom. Of if a chief was without a wife, there one could be found-one from chiefly ancestors”. Ancestors of the Lo chiefs include, “Kauakai‘ailani, Ma‘ilikukahi, Kalona, Piliwale, Kukaniloko, Pa‘akakanilea {Pa‘akanilea}, Ka‘akauualani, Ka‘au, Lale, Paoakalani, Pakapakakuaua, Nononui, Kokoloea, and a great many others”. (Kamakau, 1964:5)

9. The Lo chiefs are also decendants “from Ulu and Nanaulu, sons of Ki‘i, twelfth in succession from Wakea and Papa, all high chief families count descent. . . the important Meweke family is , according to Kamakau, the first of that line form whom men today trace ancestry.”(Beckwith, 1970: 352) “The coming of Maweke and his sons to the Hawaiian group is dated sometime between the eleventh and twelfth centuries; Their descendents are supposed to have occupied the whole of Oahu and spread to the island of Kauai, Maui and Molokai, and hence some say, the differences in speech and custom between these islands and Hawaii.” Maweke had three sons who each inherited his lands on the island of Oahu. Mulieleali‘i received the lands on the south side, Keaunui settled the western end and Kalehenui the northern end. Mulielealii has three sons, Kumuhonua the eldest, Moikeha and Olopana. Kumuhonu establishes the line of ruling chiefs on Oahu until Haka, then the Moikeha line begins with Ma‘ilikukahi. (Beckwith, 1970: 352-353)

10. In Hale‘iwa, are two spring-fed *loko pu'uone* (brackish, sand banked ponds near the shore connected to the sea by a stream or ditch). Beginning in pre-Contact times, ‘Uko‘a Pond and Loko Ea have been used to cultivate fish including *‘ama‘ama* (mullet), *āholehole* (young Hawaiian flagtail), *‘o‘opu* (goby), and *moi* (threadfish) among others (Wyban 1992:27-40). The ponds have also been home to waterbirds such as the *‘alae ‘ula* (Hawaiian mudhen) and *‘alae ke‘oke‘o* (Hawaiian coot), *‘auku‘u* (black-crowned night heron) (Wyban 1992:26). In pre-Contact times, these ponds were controlled by *ali‘i* and were associated with three *‘aumakua* who protected the ponds, produced generous amounts of fish, and took care of the health and well-being of the ‘ohana of Wailua. The most well-known

	is Laniwahine, the *mo‘o* whose forms include lizard and woman. 11. Beginning in the early 1800s, the sandalwood trade initiated economic and cultural transformations in Waialua Moku. It was the strict monopoly of the *ali‘i* (chief) beginning with Kamehameha. The demands put on the *maka‘āinana* (commoners) to harvest wood for trade caused many taro fields to become fallow. These were later used by Chinese immigrants for rice farming. As the sandalwood trade collapsed in the 1830s, Protestant missionaries were establishing their presence in Waialua. 12. During this time, whaling enterprises were emerging to fill the void and activity at Waialua. The islands became a victual and layover base in the mid-Pacific. From the 1840s into the early 1860s the Hawaiian economy focused on supplying whale ships during their long layovers. With the dwindling of ship arrivals during the 1860s, many people in districts like Waialua which had been dependent on the victualing trade migrated to Honolulu and other parts of O‘ahu. 13. Following the death of Victoria Kamāmalu in 1866, Pa‘ala‘a Ahupua‘a, along with her many other land holdings, was passed on to successive members of the *ali‘i*, ending up being part of the Princess Bernice Pauahi Bishop Estate (i.e. Kamehameha Schools). 14. 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. These rice growers had settled after fulfilling their contracts with the sugar plantations. Into the 20th century, rice continued to be cultivated in the Waialua District (including Pa‘ala‘a), and other areas within the Hawaiian Islands. However, it declined steadily during the decades leading up to World War II. 15. The Hale‘iwa Hotel continued to operate in the first decades of the 20th century. It was taken over by the U.S. Army in the 1930s, serving as a center for recreational activities by military personnel in Hale‘iwa during World War II. 16. 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 Manabu Nonaka and Lucy Robello (from Portugal)

	convey the value of natural resources to local diets (e.g. fish and semi-wild fruit trees), in children’s play, and in creating a sense of place. Through their stories, we also learn that the water in Anahulu Stream and Hale‘iwa Bay were clearer and more productive; and we hear about early interactions between locals and tourists on the North Shore; the social activity that centered around Haleiwa Hotel and it prestigious guests, including Queen Emma and Charles Bishop; and the commercial side of Haleiwa town in the early 1900s. 17. In 1984 the City and County of Honolulu established the Haleiwa Historic, Scenic and Cultural District, mandating preservation rules and new construction constraints for Haleiwa Town. The present Project area was probably under sugar cultivation till residential use around the 1930s. Based on oral histories, the Waialua Agricultural Company had this parcel, possibly with a “motor pool” type facility. The Ohama family used the parcel for a gas station and residential occupation untill around 1954 (*per. comm.* Ms. Laura Takahashi, Fritz Johnson Architects). The parcel has been utilized as a residence, without the gas station operating, since 1954.
Results of Community Consultation	CSH attempted to contact 22 community members and government agency and community organization representatives. Of the nine individuals that responded, four of these kūpuna and/or kama‘āina participated in interviews for more in-depth contributions to the CIA. At the present time, all interviews have been reviewed and approved by the participants for inclusion in this CIA. This community consultation indicates: 1. *Kama‘āina* view the Project area as part of a storied landscape populated by *ali‘i* and cultural resources. Mrs. Awai-Lennox describes the environs as having cultural and historic significance. The wetlands were fed by *auwai* and *ali‘i* were known to have bathed in the fresh water fed by area springs. Speaking of the larger environs surrounding the Project footprint she says, “We are certain the *ali‘i* enjoyed the balmy weather and abundance of food [in the area],” explaining that Queen Lili‘uokalani had a home near Anahulu stream. 2. *Kama‘āina* maintain a strong connection to the environs surrounding the Project area by lived experiences with its freshwater resources. Mrs. Awai-Lennox describes how at one time when the waters were clean there were *‘o‘opu* (goby, see Appendix B. Common and Scientific Names for Plants and

Animals Mentioned by Community Members for a complete listing from the report), freshwater shrimp—*‘ōpae*, two types of clams, and crayfish. She says the water quality has declined, these delicacies are hardly available at all now, and the water is populated with inedible dark tilapia. Mr. Asato also recalls the Anahulu River being clean and full of fish, especially mullet and *‘opae*. People could be found along the river mouth gathering *limu ‘ele‘ele*. Times have changed according to Mr. Asato and these fish and *limu* are scarce today.

3. Mrs. Awai-Lennox explains how the landscape looks and how the land is being used has changed since she was young. As a child, she and her family had taro and rice growing on their property and in the area between their property and the Project area. “We had leased to an old Chinese family to do rice and they used water buffalo [to plow],” she recalls. Beyond rice, other plants were introduced and became common. For example, she names the lotus, or *hasu* (Japanese). Now she says the area is overgrown and not tended.

4. The area has been valued as a recreational site by all ages. In addition to the ocean recreation activities, as children, she and her siblings swam in Ananhulu Stream. “Back then, the water was clean!” she recalls. Mrs. Awai-Lennox also remembers her father talking about a race track, somewhere near their home in the wetlands and grasslands area. She estimates it may have existed during Liliuokalani’s time in Hale‘iwa. Hunting (for birds and pigs) and fishing were other recreational activities that were popular in the area at that time.

5. The Waialua coast is well known for its surfing traditions. Today the *he‘enalu* areas or (surfing spots) are known by various names including Laniakea, Puena, Ali‘i Beach and more. Mr. Henry Preece, or Unlce Henry, has been influential in the surfing traditions in the Wailua area and throughout the world. He has passed down histories of this area and inspired future generations of ocean men and women. Today surfing has grown exponentially since Uncle Henry moved to Haleiwa from Waikele/Waipahu area in 1953.

6. The Project area and environs are sources of plants that are valuable resources for food, medicine, ornamental and other uses. Mrs. Awai-Lennox recounts how she and her siblings collected *kiawe* (mesquite) seed pods for fodder and they gathered *guava* and passion fruit for juice. For special

occasions her family gathered *hala* (pandandus) and *kukuna-o-ka-lā* (mangrove flowers) for lei. In proximity to the Project area, Mrs. Awai-Lennox says that although the wetlands aer overgrown now, “If you look hard enough, you’ll still see some Hawaiian plants: *honohono* grass, *pōpolo*—which was occasionally used medicinally. There’s a creeping water violet and a clover, a large clover leaf that is found only around wetlands.” In terms of cultivated plants, she explains that they had their taro lands, breadfruit, and bananas, which still exist to some extent but their supplies have diminished. She points out that although they still have many coconuts, little taro is available on their property compared to the past.

7. The Project area and ocean environs are also valuable resources for food, medicine, ornamental and other uses. Mr. Asato remembers fisherman standing on the *pohaku* (rock), called Pohaku o Lanai. To his knowledge the fisherman would stand on the rock to watch for fish and strike the rock when fish were sighted to let fisherman know that the schools were running. During certain seasons fish would run in that area, the *halalū* and *akule* would come in and people would be all along the coast. They still come in today but not the way they used to. Another fish that would run along this coast was the *‘āweoweo*, a red fish. Uncle Henry remembers them coming in by the thousands, turning the ocean red. Since the construction of the harbor he has observed that the fish do not seem to be as plentiful or come in shore as they used to regularly.

8. Birds are another important cultural resource in the area. Mrs. Awai-Lennox relays multiple examples of how birds have been and continue to be important in the area. Perhaps most relevant is the *‘alae ‘ula*, an endemic water bird, which is rare but still found very near the Project area in freshwater marshy areas. It was present when she was growing up and, she still sees them daily in the wetlands near their home in direct proximity to the Project area. Mrs. Awai-Lennox describes peacocks and wild turkeys as abundant and hunted.

9. Community members have two recommendations for the Project. Both Mr. Sato and Uncle Henry recommend that rather than the conventional raised curbed sidewalks, the Project consider non-elevated sidewalks without curbs. They suggest these will provide safety for pedestrians while also accommodating local drivers who do not want to see street parking diminished. They would also like to see cross walks put

	in for safety reasons as well.
Impacts and Recommendations	Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, CSH foresees no 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. However, CSH foresees the following potential impacts on cultural, historic, and natural resources, and makes the following recommendation: 1. Based on background information, pre- and post- contact cultural resources, including evidence of habitation, agricultural sediments and burials have been documented within the vicinity of the Project Area. Thus, should cultural materials including burial sites, artifacts, and subsurface cultural layers be identified during ground disturbance, all work in the immediate area should cease and the appropriate agencies pursuant to applicable law should be notified. 2. There are a significant number of important cultural and environmental resources in the vicinity of the Project area. The Anahulu River has been documented as an important resource for the community. CSH recommends that Kamehameha Schools work with the community to raise awareness of these sites and resources. Kamehameha encouraged both commoners and ali`i to farm and fish and "he himself would fish and continue his laborious efforts at carrying rock or timber" (McKeague, 2002: 23). He worked to restore Kawailoa's Uko`a pond, and Kamehameha II (Liholiho) subsequently visited the ponds. As a result, it can be concluded that these areas have been recognized not only as natural resources, but also as cultural resources. KS should continue to mālama (care for) these resources and related ones in the area due to their importance to Hawaiian culture and the unique biodiversity of the area that has supported by Hawaiian cultural activities such as aquaculture and taro cultivation. KS should also consider attending to environmental concerns and relationships to adjacent wetland areas, such as those in direct proximity to the Project area where ali‘i are known to have frequented and where native flora and fauna have thrived. 3. Haleiwa is a Special District with unique design controls, it is recommended that the developer stay with in the state guidelines for this district. It is important to members of the community that the rural scale and character of the area be considered

	during design conception and development. Haleiwa town provides a historical encounter with a rural commercial setting and as a result attracts *kama‘aina* and numerous tourist to this area. Padestrian safety should be a priority as well, including cross walks and the adoption of non-elevated sidewalks without curbs, rather than the conventional raised curbed sidewalks is recommended. This will provide needed increased safety for pedestrians while also accommodating parking for local drivers.

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Section 1 Introduction

1.1 Project Background

At the request of Group 70 International, Inc., Cultural Surveys Hawai‘i (CSH) is conducting a Cultural Impact Assessment (CIA) for the redevelopment of some of Kamehameha Schools’commercial properties located in Hale‘iwa. The 4.22-acre Project area is located in Kawailoa Ahupua‘a, Waialua District, O‘ahu Island ([1] 6-6-004:013, 14, 15, 16, 17, 18, 19, 27, 28, and 32) (see Figure 1 and Figure 3).

Kamehameha Schools (KS) is proposing to redevelop its commercial properties located in Hale‘iwa along Kamehameha Highway from Mahaulu Lane to Kewalo Lane. These properties include the popular Matsumoto Shave Ice business. The Project site is bordered by retail stores to the north, Kamehameha Highway to the east, Hale‘iwa Town Center to the south, and agricultural lands to the west. The neighborhoods surrounding the Project site consist primarily of low-rise residential and low-rise commercial uses.

The frontage of the Project is currently zoned Residential District (R-5). This zoning reflects historic land use of storeowners who lived on the site. However, the residential zoning is nonconforming with the current and proposed commercial uses. The proposed action, therefore, involves consolidation and subdivision of parcels and change of zone to allow conforming uses. Parcels fronting Kamehameha Highway will require zone change from Urban Residential District (R-5) to Neighborhood Business District (B-1). Parcels located behind the commercial frontage will require zone change from General Agricultural District (AG-2) to Country District to allow parking uses.

The intent of this redevelopment Project is to revitalize existing businesses and provide essential infrastructure, while retaining the rural scale and plantation character of the Hale‘iwa Special District. The redevelopment will expand existing retail frontage with a combination of new in-line storefronts and preservation or reconstruction of selected historic buildings. The Project will also increase pedestrian pathways and safety, provide a central gathering place, and improve traffic flow with a newly constructed rear parking lot. The existing properties support approximately 14,000 SF of Gross Leasable Area (GLA), while the final build-out of the proposed redevelopment will provide up to 30,000 square-feet of GLA.

The construction of the new buildings will be designed to provide an opportunity for pedestrian walkway and landscape improvements along the Kamehameha Highway storefronts. The new asphalted parking area behind the commercial storefront will have two access points off existing roadways, which include Mahaulu Lane and Hale‘iwa Town Center driveway (see Figure 4).

In March of 2008, KS completed the North Shore Master Plan. The plan consisted of the following six general planning elements:

- Increase natural and culture resource stewardship and management;
- Expand educational opportunities;

- Establish alternative energy uses;
- Enhance diversified agriculture & food production;
- Develop/redevelop rural commercial properties; and
- Develop rural residential properties.

The plan called for seven catalyst projects as part of the implementation process. This Project specifically addresses Phase 1 (Entitlement & Predevelopment Phase) of Catalyst Project #4 “Matsumoto Redevelopment Project”. The Project area includes ten tax map parcels (TMK: [1] 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028 & 032). This redevelopment Project includes a number of well-known enterprises including Matsumoto’ Shave Ice, Aoki’s Shave Ice, Iwa Gallery, Global Creations and Haleiwa Eats all fronting Kamehameha Highway as well as significant parking areas and relatively undeveloped lands in back (*makai* or ocean side) of the enterprises fronting Kamehameha Highway.

1.2 Document Purpose

The Project requires compliance with the State of Hawai‘i environmental review process (Hawai‘i Revised Statutes [HRS] Chapter 343), which requires consideration of a proposed Project’s effect on cultural practices. CSH is conducting this CIA at the request of Group 70 International, Inc. Through document research and cultural consultation efforts, this report provides information pertinent to the assessment of the proposed Project’s impacts to cultural practices and resources (per the *Office of Environmental Quality Control’s Guidelines for Assessing Cultural Impacts*), which may include Traditional Cultural Properties (TCPs) of ongoing cultural significance that may be eligible for inclusion on the State Register of Historic Places, in accordance with Hawai‘i State Historic Preservation Statute (Chapter 6E) guidelines for significance criteria in Hawai‘i Administrative Rules (HAR) §13-275 under Criterion E, which states to be significant an historic property shall:

> Have an important value to the Native Hawaiian people or to another ethnic group of the state due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts—these associations being important to the group’s history and cultural identity.

The document is intended to support the Project’s environmental review and may also serve to support the Project’s historic preservation review under HRS Chapter 6E and HAR Chapter 13-275.

1.3 Scope of Work

The scope of work for this CIA includes:

1. Examination of cultural and historical resources, including Land Commission documents, historic maps, and previous research reports, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal, and other resources or agricultural pursuits as may be indicated in the historic record.

2. Review of previous archaeological work at and near the subject parcel that may be relevant to reconstructions of traditional land use activities; and to the identification and description of cultural resources, practices, and beliefs associated with the parcel.
3. Consultation and interviews with knowledgeable parties regarding cultural and natural resources and practices at or near the parcel; present and past uses of the parcel; and/or other practices, uses, or traditions associated with the parcel and environs.
4. Preparation of a report that summarizes the results of these research activities and provides recommendations based on findings.

1.4 Environmental Setting

1.4.1 Natural Environment

The western (*makai*) half of the Project area is Haleiwa Silty Clay, zero to two percent slopes (HeA) and the eastern (*mauka or mountain side*) half is Kawaihapai Clay Loam, two to six percent slopes (KIB) (see Figure 5). The natural topography of the Project area is level, with thick vegetation and large trees. The flora in the Project area was all introduced species, no plant species endemic to the islands were observed during survey. The vegetation observed on survey included exotic grasses, Java plum (*Syzygium cumini*), date palm (*Phoenix dactylifera*), red hibiscus (*Hibiscus rosa-sinensis*), ‘opiuma (*Pithecellobium dulce*), monkey pod trees (*Albizia saman*), mother-in-law’s toungue (*Sansevieria trifasciata*) and ficus trees (*Ficus benjamina*) (Foote et al. 1972).

1.4.2 Built Environment

The Project area is bound on its north side by Mahaulu Lane, on its east side by Kamehameha Highway, on its south side by Kewalo Lane, and on its west side by residential lots and a driveway that extends from Mahaulu Lane to the north. Roughly half of the area of the Project area is dozed, leveled and paved with basalt gravel, where movable storage containers are and wooden storage sheds were built in place to store tools and other equipment.

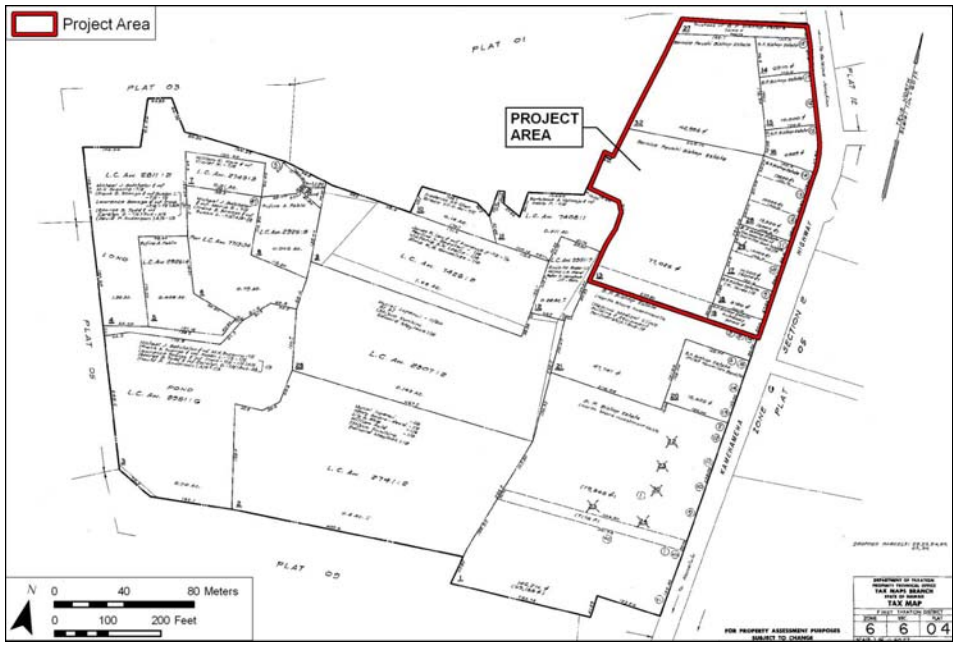

Figure 2. Tax Map Key plat map [1] 6-6-004 showing Project area

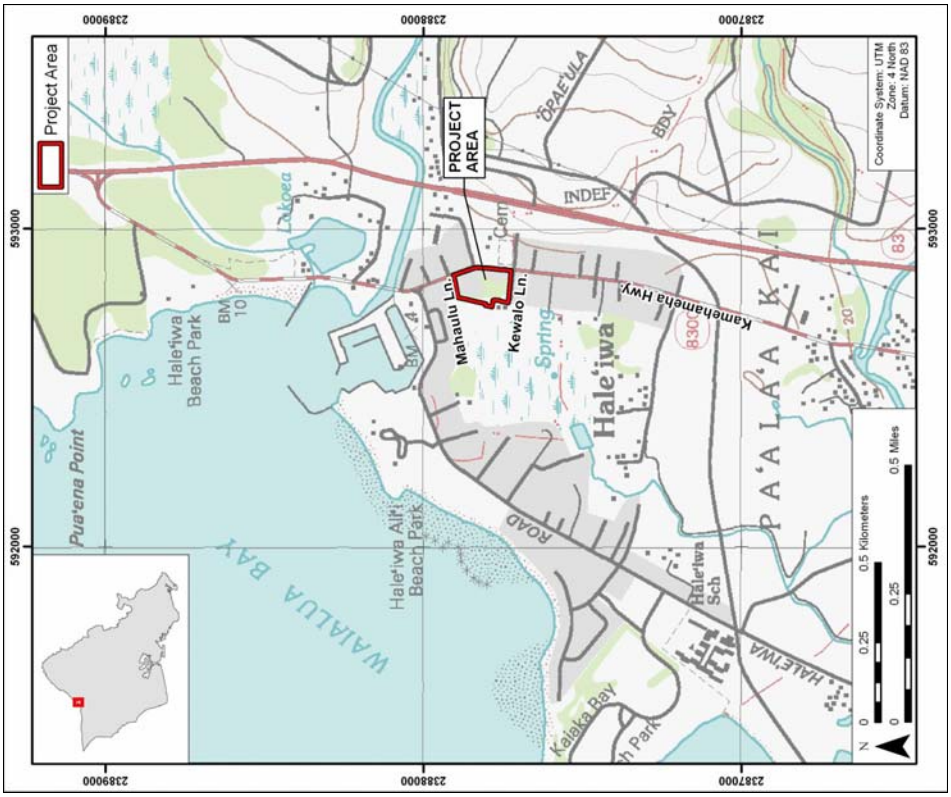

Figure 1. U.S. Geological Survey Map (1999) showing Project area

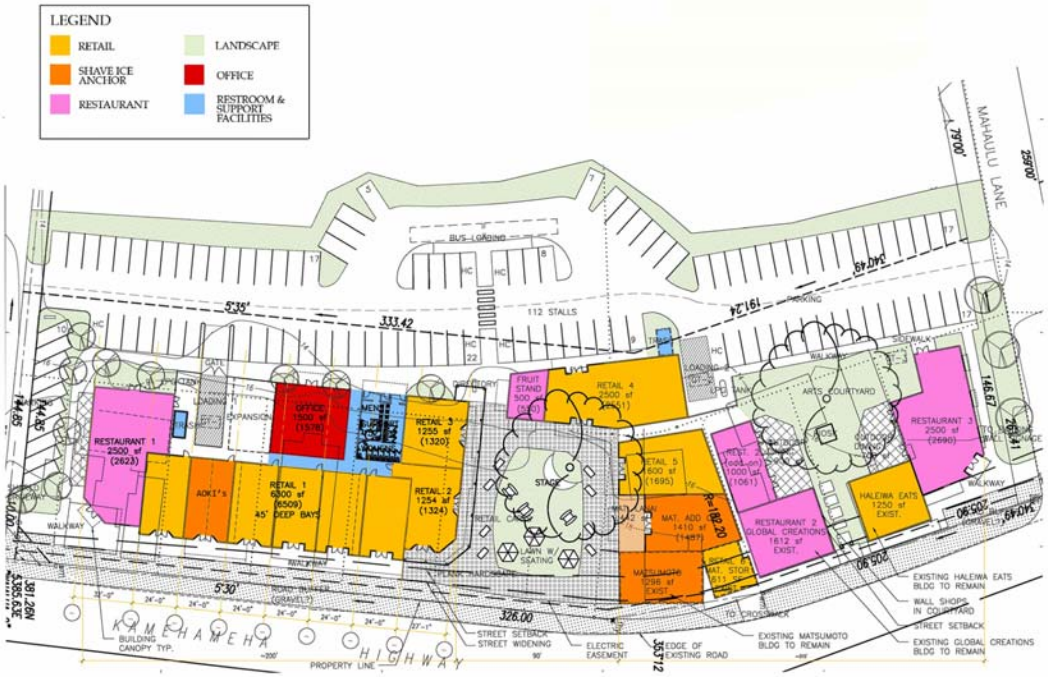

Figure 4. Site Plan, provided by client

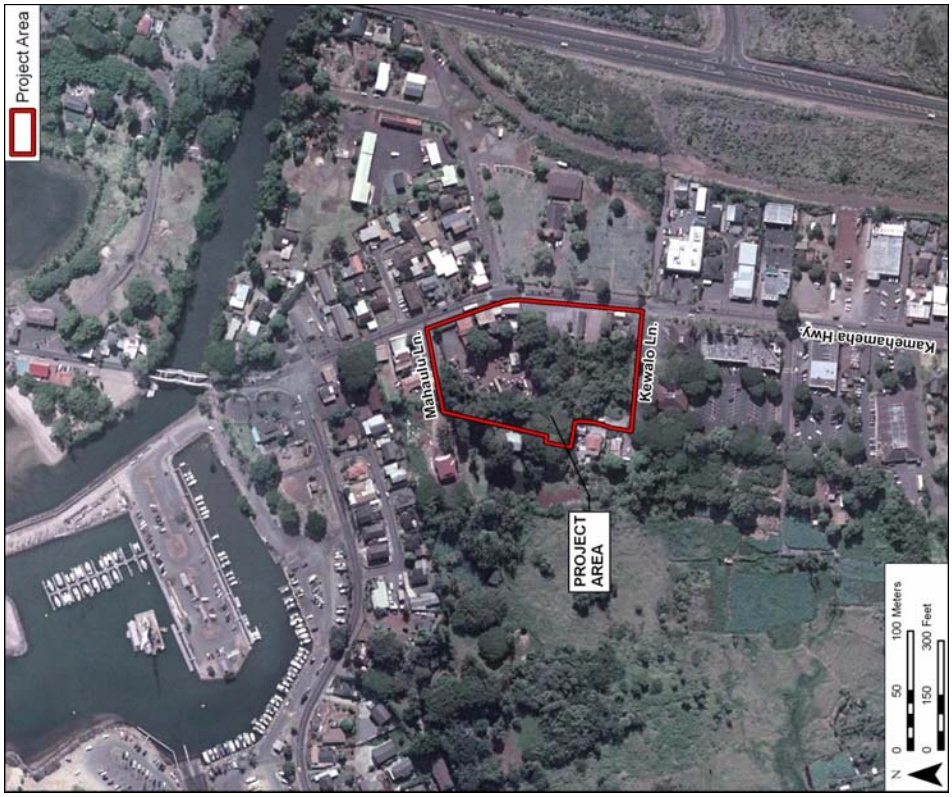

Figure 3. Aerial photograph showing Project area

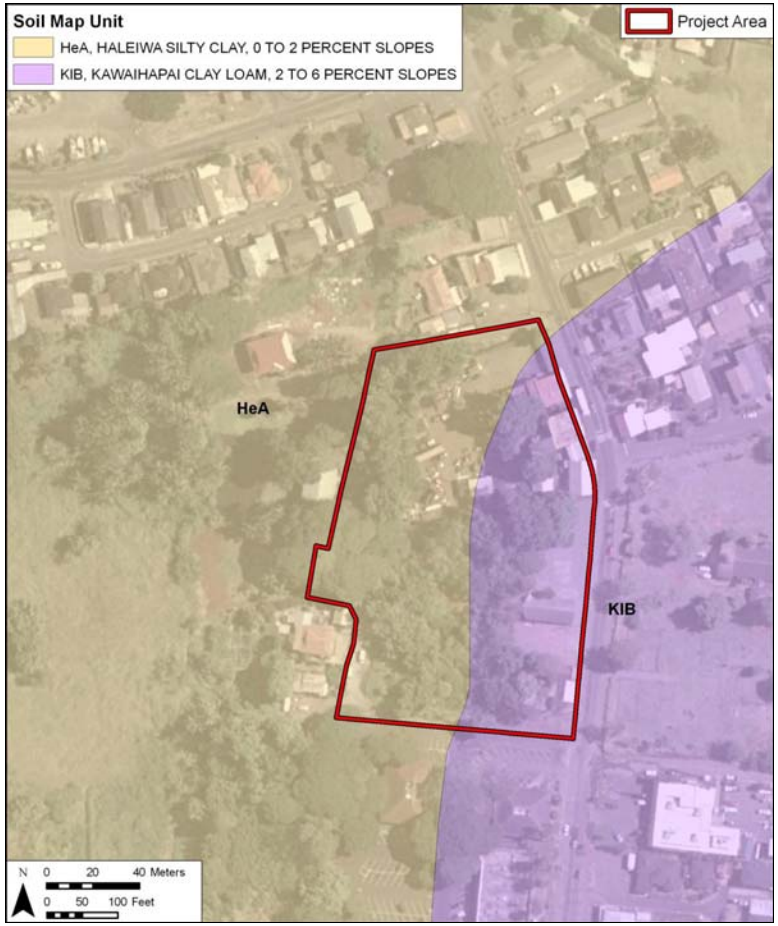

Figure 5. Soils map of Project area (Soil boundaries from Foote et al. 1972)

Section 2 Methods

2.1 Archival Research

Historical documents, maps and existing archaeological information pertaining to Pa‘ala‘a and Kawaialoa were researched at the CSH library and other archives including the University of Hawai‘i at Mānoa’s Hamilton Library, the State Historic Preservation Division (SHPD) library, the Hawai‘i State Archives, the State Land Survey Division, and the archives of the Bishop Museum. Previous archaeological reports for the area were reviewed, as were historic maps and photographs and primary and secondary historical sources. Information on Land Commission Awards (LCAs) was accessed through Waihona ‘Aina Corporation’s Māhele Data Base (www.waihona.com) as well as a selection of CSH library references. Research for the Cultural and Historical Background section centered on the following cultural and historic resources, practices, and beliefs: religious and ceremonial knowledge and practices; traditional subsistence land use and settlement patterns; gathering practices and agricultural pursuits; *wahi pana* (storied places) and associated *mo‘olelo* (stories, oral traditions), *mele* (songs), *oli* (chants), and *‘ōlelo no‘eau* (proverbs); and historic land transformation, development, and population changes (see Scope of Work above).

2.2 Community Consultation

2.2.1 Sampling and Recruitment

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

We began with purposive sampling informed by referrals from known specialists and relevant agencies. For example, we contacted the SHPD, Office of Hawaiian Affairs (OHA), O‘ahu Island Burial Council (OIBC), and community and cultural organizations in Kawailoa for their brief response/review of the Project and to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the Project area and vicinity, cultural and lineal descendants of Kawailoa, and other appropriate community representatives and members. Based on their in-depth knowledge and experiences, these key respondents then referred CSH to additional potential participants who were added to the pool of invited participants. This is snowball sampling, a chain referral method that entails asking a few key individuals (including agency and organization representatives) to provide their comments and referrals to other locally recognized experts or stakeholders who would be likely candidates for the study (Bernard 2006:192). CSH also employs expert or judgment sampling which involves assembling a group

of people with recognized experience and expertise in a specific area (Bernard 2006:189–191). CSH maintains a database that draws on over two decades of established relationships with community consultants: cultural practitioners and specialists, community representatives and cultural and lineal descendants. The names of new potential contacts were also provided by colleagues at CSH and from the researchers' familiarity with people who live in or around the study area. Researchers often attend public forums (e.g., Neighborhood Board, Burial Council and Civic Club meetings) in (or near) the study area to scope for participants. Please refer to the Community Consultation Table in section 7.1, for a complete list of individuals and organizations contacted for this CIA.

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

2.2.2 Informed Consent Protocol

An informed consent process was conducted as follows: (1) before beginning the interview the CSH researcher explained to the participant how the consent process works, the Project purpose, the intent of the study and how his/her information will be used; (2) the researcher gave him/her a copy of the Authorization and Release Form to read and sign (Appendix F); (3) if the person agreed to participate by way of signing the consent form or providing oral consent, the researcher started the interview; (4) the interviewee received a copy of the Authorization and Release Form for his/her records, while the original is stored at CSH; (5) after the interview was summarized at CSH (and possibly transcribed in full), the study participant was afforded an opportunity to review the interview notes (or transcription) and summary and to make any corrections, deletions or additions to the substance of their testimony/oral history interview; this was accomplished either via phone, post or email or through a follow-up visit with the participant; (6) the participant received the final approved interview and any photographs taken for the study for record. If the participant was interested in receiving a copy of the full transcript of the interview (if there is one as not all interviews are audio-recorded and transcribed), a copy was provided. Participants were also given information on how to view the report on the OEQC website and offered a hardcopy of the report once the report is a public document.

2.2.3 Interview Techniques

To assist in discussion of natural and cultural resources and cultural practices specific to the study area, CSH initiated semi-structured interviews (as described by Bernard 2006) asking questions from the following broad categories: gathering practices, *mauka* and *makai* resources, burials, trails, historic properties, and *wahi pana*. The interview protocol is tailored to the specific natural and cultural features of the landscape in the study area identified through

archival research and community consultation. In this study, for example, fishing, recreational uses of the ocean, and agriculture were emphasized over other categories less salient to Project participants. These interviews and oral histories supplement and provide depth to consultations from government agencies and community organizations that may provide brief responses, reviews and/or referrals gathered via phone, email and occasionally face-to-face commentary.

2.3 In-depth Interviews and Oral Histories

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

2.4 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, ethnohistorical 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 and Kaho‘olawe). Generally our goal is to provide educational opportunities to students through internships, share our knowledge of historic preservation and cultural resources and the State and Federal laws that guide the historic preservation process, and through involvement in an ongoing working group of public and private stakeholders collaborating to improve and strengthen the Chapter 343 environmental review process.

Section 3 Cultural and Traditional Background

3.1 Waialua Moku

O‘ahu was divided into six *moku*—Kona, ‘Ewa, Wai‘anae, Waialua, Ko‘olauloa, and Ko‘olaupoko—that were further divided into 86 *ahupua‘a* (Kame‘eleihiwa 1992:330). These lands, in turn, were further divided as private property during the Māhele of 1848, modern maps and land boundaries still generally follow the ancient system of land division. The Project area lies in the *makai* section of Kawailoa Ahupua‘a (according to boundary lines provided by the Office of Hawaiian Affairs) in close proximity to Pa‘ala‘a Ahupua‘a in Waialua Moku on the island of O‘ahu.

The district of Waialua is rich in legends, stories, proverbs, and myths. According to one tradition, Waialua means “two waters” which refers to two large stream drainages (Anahulu and Helemano-Poamoho-Kaukonahua) that once irrigated extensive taro fields in the *ahupua‘a* of Kamananui, Pa‘ala‘a and Kawailoa, the more populous *ahupua‘a* on the eastern side of the district. Mary Kawena Puku‘i translated another meaning for the moku of Waialua:

> Waia, grandson of Wakea was said to be a cruel chief. He cared nothing of the gods or of doing good. He had men and women killed for the fun of killing them. When he saw a maiden with shapely legs, he ordered them cut off and if a man or a woman had beautiful tatooing [sic] he was put to death. Because of this he was driven away by the people. In the legend of Hiiaka, it was said that Waia lived and practiced evil deeds at Waialua, The people suffered so much there that the place was named for him Waia-lua (Doubly disgraceful). (Pukui synopsis of Hoku o Hawaii, March 12, 1928, cited in Sterling and Summers 1978:88)

The significance of the *moku* of Waialua in the consciousness of Native Hawaiians—and in particular, those old families native to O‘ahu—is suggested in the numerous traditions associated with Waialua. 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:

> For the 28 generations from Hulihonua 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 – Maui from the time of Heleipawa son of Kapawa, and Kauai from the time of Luanu‘u.(Kamakau 1964:3)

The chiefly rank Lo is also associated with this moku, known as the chiefs of Lihue, Wahiawa and Halemano on Oahu, they were called Lo chiefs or *po‘e Lo Ali‘i* {“people from whom to obtain a chief”}.” (Kamakau, 1964:5) The Lo chiefs, were a line of chiefs worthy and sought out by other chiefly lines. They were known to live in the mountain areas and were admired for their strict adherence to the kapus associated with their rank.

> The men had kapus, and the women had kapus, and when they joined their kapus and children were born, the children preserved their kapus. The lived in the mountains (*i kuahiwi*); and if a kingdom was without a chief, there in the mountains could be found a high chief (*ali‘i nui*) for the kingdom. Or if a chief was without a wife, there one could be found -- one from chiefly ancestors. Kauakai‘ailani, Ma‘ilikukahi, Kalona, Piliwale, Kukaniloko, Pa‘akakanilea {Pa‘akanilea}, Ka‘akauualani, Ka‘au, Lale, Paoakalani, Pakapakakuaua, Nononui, Kokoloea, and a great many others were Lo chiefs. (Kamakau, 1964:5)

The Lo chiefs are also decendants “from Ulu and Nanaulu, sons of Ki‘i, twelfth in succession from Wakea and Papa, all high chief families count descent. . . the important Meweke family is, according to Kamakau, the first of that line form whom men today trace ancestry.”(Beckwith, 1970: 352) “The coming of Maweke and his sons to the Hawaiian group is dated sometime between the eleventh and twelfth centuries; Their descendents are supposed to have occupied the whole of Oahu and spread to the island of Kauai, Maui and Molokai, and hence some say, the differences in speech and custom between these islands and Hawaii.” Maweke had three sons who each inherited his lands on the island of Oahu. Mulieleali‘i received the lands on the south side, Keaunui settled the western end and Kalehenui the northern end. Mulielealii has three sons, Kumuhonua the eldest, Moikeha and Olopana. Kumuhonu establishes the line of ruling chiefs on Oahu until Haka, then the Moikeha line begins with Ma‘ilikukahi. (Beckwith, 1970: 352-353)

Ma‘ilikūkahi was the son of Pua‘a-a-Kahuoi and Nononui, he was born at the sacred site of Kūkaniloko, Waialua (Site 218; McAllister 1933:134–137), one of two famous birthing places in the Hawaiian archipelago (the other is in Kaua‘i) for the highest ranking chiefs, the *ali‘i kapu* (sacred chiefs) “an *ali‘i*, an *akua*, a *wela*—a chief, a god, a blaze of heat” (Kamakau 1991:38). Kūkaniloko is located near what some people consider the *piko* (navel or center) of O‘ahu (Becket and Singer 1999:64) It is considered a very sacred place; Ho‘olono-pahu was also a very sacred and consecrated place. “It was the waihau heiau where the navel cords of the chiefs were cut. There the ancient *pahu* drum Hāwea, which had been brought from the land of Kahiki, was sounded to announce the birth of a chief and the cutting of the navel cord.” (Kamakau, 1991: 136). After Ma‘ilikūkahi became mō‘ī, he was taken to Waikīkī to establish his court. Prior to that “the chiefs had lived in Wai‘alua and ‘Ewa”. (Kamakau, 1991: 54)

3.2 Kawailoa and Pa‘ala‘a Ahupua‘a

Important cultural and natural features of the Project area environs are located in Figure 8. Of particular imporatance are the abundant coastal resources on the land and in the water. With sources in the Ko'olau Mountain Range, the Anahulu River, 'Opae'ula Stream, and Helemano Stream provided abundant freshwater that contributed to the development of the area as a valuable agricultural center.

3.2.1 Subsistence and Settlement

The Project area is located between two major wet-taro cultivation and settlement centers. The one closest to the Project area is the largest, by far. It was centered on the Anahulu River/Kawailoa Gulch system that feeds into Waialua Bay, and includes the extensive wetlands and fishponds at ‘Uko‘a and Lokoea (or Loko ea):

> 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* [dryland] 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)

> The presence of no less than eleven temples, several of *luakini* [human-sacrificial] 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 Lokoea fishponds. (Kirch 1992:19)

In pre-Contact times, this system likely supported several thousands of families including many chiefs and high-status individuals. Kirch’s (1992) archaeological study of the Anahulu Stream demonstrated clearly that cultivation of this drainage extended several miles into the interior. In the upper reaches of the Anahulu, swidden planting practices, supported by seasonal or temporary habitation sites, were replaced by the later eighteenth to early nineteenth centuries with more intensive modification of the landscape (e.g., formal artificial terracing and irrigation ditches) and more permanent settlement in response to increasing population pressures in the lowlands.

The other major wet-taro cultivation and settlement center, to the northeast of the Project area, was Waimea Valley, which being much smaller than the agricultural heart of Waialua Moku, is beyond the scope of this CIA.

It seems clear, based on physiographic characteristics, archaeological data, and ethno-historical information that the vicinity of the Project area has been used for cultivation of foodstuffs such as taro, breadfruit, and sweet potato; and that aquaculture and fishing were also important.

3.2.2 Wahi Pana

A Hawaiian *wahi pana* “physically and poetically describes an area while revealing its historical or legendary significance” (Landgraf 1994:v). *Wahi pana* are sacred places that include such cultural properties as *heiau*, *loko i‘a*, *ala hele* (trail), *ilina* and *iwi kūpuna* (ancestral bone remains), land divisions, and natural geographic locations, such as streams, peaks, rock formations, ridges, and offshore islands and reefs that are associated with culturally significant beliefs or events. A *wahi pana* leaves an imprint on the landscape even if its tangible properties no longer exist, as the *mana* (divine power) of previous people and events associated with this space continues to manifest itself. For example, the stereotypical *heiau* is composed of terraces, enclosures, walls, mounds, or upright stones, but *heiau* can also be sacred places on a landscape that lack built structures, natural landscape features such as rock outrcoppings, and earthworks where *mana* is concentrated and transferred between the deities and worshippers (Becket and Singer 1999:xix-xx).

The *wahi pana* of Pa‘ala‘a and Kawailoa Ahupua‘a link the *kama‘āina* and *kūpuna* to their past. This section traces the *wahi pana* from the mountain peaks and valleys to the lowlands and coasts. All *wahi pana* meanings are cited from Pukui et al. (1974) unless otherwise noted and spelling and use of diacriticals follow Pukui et al. (1974).

3.3 Kawailoa and Pa‘ala‘a Place Names

The rich taro lands of the Waialua District were located near the coast in the *ahupua‘a* of Pa‘ala‘a and Kawailoa, on the eastern end of the district. Unlike most *ahupua‘a*, the boundary between these two areas does not follow the contours of the land, but rather seems to have been drawn to allow the rich taro lands to be shared between these *ahupua‘a*. In historic maps, the boundaries of the Project site are designated in Pa‘ala‘a. For example, in and 1883 map entitled the “Konohiki Lands in Paalaa” (Figure 9), the former taro lands west of the Anahulu River (which appears to include the Project aera) are designated as part of “Pa‘ala‘a Lands.” In 1915 “Pa‘ala‘a Kai Subdivision” was built in this area (Podmore 1915), and the surrounding area today (including the Project area) is often referred to by the same name, although it is within the *ahupua‘a* of Kawailoa according to both OHA and USGS current *ahupua‘a* boudaries. Even though the Project area is within the boundaries of Kawailoa Ahupua‘a, the *makai* areas of both Kawailoa and Pa‘ala‘a Ahupua‘a are connected to the cultural and historical significance of Project area. Therefore, the background section of this report includes aspects of both Pa‘ala‘a and Kawailoa.

The exact derivation of the name “Pa‘ala‘a” is uncertain. Pa‘ala‘a means “the sacred firmness” (Pukui et al. 1974:173), which may relate to the Pōhaku Lanai tradition which indicates that the massive rock on Kalaeo‘iupaoa Point, said to be sacred to the god Kāne, floated from Kahiki and became fixed there. Pa‘ala‘a is also the name of a wind that has been poetically referred to as a “breath of air for those of the royal court” (Pukui and Elbert 1971:100, 273).

Place names found in land documents and on historic maps are listed in Appendix C Place names have been compiled by Lloyd Soehren for his Hawaiian Place Name database (ulukau.org). Soehren includes place name meanings from Pukui et al.’s (1974) definitive text, *Place Names of Hawaii*. When no meaning is given in this text, Soehren sometimes suggests a place name for simple words based on Pukui and Elbert’s (1986) *Hawaiian Dictionary.*

Pa‘ala‘a generally runs along the shore at Kaiaka (“shadowed sea”) Point on Kaiaka Bay toward the western side of Waialua Bay. It extended to the Ko‘olau Mountain Range on the side of the ‘Ōpae‘ula (“red shrimp”) Stream on the north and the side of the Helemano (“many snared” or “many going”) Stream to the south. These two streams join near the coast to form the Paukauila Stream. There are some alternate names for this stream. In mid-nineteenth century land documents, ‘Ōpae‘ula Stream is sometimes referred to as Alamuki, Helemano is called Mamalio, and Paukauila Stream is called Laukī‘ha‘a.

Kaiaka Point, or Kalaeo‘iupaoa Point, on the east side of Kaika Bay, was the site for a large balancing rock, or *pōhaku*, called Pohaku o Lanai. The point near the northern coastal boundary of Pa‘ala‘a was called Kūpaoa (“strong, permeating fragrance”), which may have referenced jasmine, or night cestrum, which was used to scent kapa (Pukui and Elbert 1986:185).

Several other place names are mentioned in mid-nineteenth century land documents: seven *‘ili* names, A‘akala, Hānau‘ewa, Kalie, Kealapi‘i, Kūmalie, Laukīha‘a, and Waikaalulu; one *loko* (pond) called Punamoe, and one *pali* (cliff) called Lā‘aukalakala. The seaward portion of Pa‘ala‘a was called Pa‘ala‘a Kai and the upland portin was called Pa‘ala‘a Uka. The upland forest area was Halemano, or Helemano, a place with a spring called Kauikua. There are many mo‘olelo associated with this area.

3.3.1 Kawailoa Place Names near Waialua Bay in Proxemity to the Project Area

Kawailoa extended along the shore from Waialua Bay to Waimea Bay and from the coast to the Ko‘olau Mountains. The current project area is within a small section of Kawailoa between the Anahulu and ‘Ōpae‘ula Streams where the two streams enter the sea at Waialua Bay. Only those place names found near Waialua Bay in Kawailoa Ahupua‘a are listed in Table 1.

Table 1. Places Names of Kawailoa near Waialua Bay

Place Name	*Type*	Meaning	Comments
--	*akua* [god] *stone*		Site 232. “Akua stone, Anahulu river, Waialua. A stone which formerly blocked the entrance of the Anahulu River and was side to be sacred. This stone was just beneath the water and was said to be occasionally exposed. Some years ago when it was removed in order that the glass-bottomed boat and sampans might use the river, much anxiety was shown by the Hawaiians, for fear of evil effects” (McAllister 1933:141).
--	*akua* stone		Site 233. “Site 232 [*sic*, should be Site 233]. Akua stone, Anahulu River, Waialua. A small fresh-water pond covering 2.5 acres, still in use. The present pond is divided from a small stream, into which its outlets (*makaha*) open by a stone and earth embankment. Its other sides are formed by the natural contours of the land” (McAllister 1933:141).
--	stone		Site 235. “Stone with curative powers, near Puaena Point... a smooth, oval-shaped stone about 2 feet high and 4 feet long which represents a woman known as Puaena who came in the following of

Place Name	*Type*	Meaning	Comments
			Pele from Tahiti. For its curative powers the stone was famous and Hawaiians came to visit it from all parts of Oahu.” (McAllister 1933:142).
Anahulu (Kamani)	*heiau*	*kamani* - a large tree (*Calophyllum inophyllum*) (Pukui & Elbert 1986)	Site 231. “Anahulu heiau, Kamani, at the location of the present [1933] Haleiwa Hotel. When the hotel was being built the heiau was destroyed. This, according to the Hawaiian, accounts for the failure of the hotel. According to Thrum [who called the heiau ‘Kamini’]... it was an ‘Unpaved heiau of large size with lime stone walls, of luakini class” (McAllister 1933:141).
Kamani (Anahulu)	*heiau*		See Anahulu
Kawaipū‘olo	*spring*	bundle of water (McAllister 1933:141)	Site 229. “Kawaipuolo spring. . . When strangers passed here and asked for water, it was given to them in a taro-leaf cup; therefore . . .‘Bundle-of-water.’ . . . the spring suddenly disappeared at one time. After long search . . . it was discovered by the seer (*kilo*) at Makaula, near Kaena Point, on the hilltop now of the same name, Kawaipuolo. From here it was conveyed in one night by the menehunes in bundles of ti and taro leaves; hence the name, ‘The-bundled-water’” (McAllister 1933:141).
Kepūwai	*heiau*	the sentinel's call of alarm, a trumpet call, as in war (Pukui & Elbert 1986)	“Site 228. The cemetery beside the church in Waialua marks the site of the heiau once known as Kepuwai. It has been completely destroyed [by 1933]” (McAllister 1933:141).
Maeaea	point	smelly (Pukui & Elbert)	See Pua‘ena Point

Place Name	*Type*	Meaning	Comments
Puaena Point	point	issue hot, to glow brightly (Pukui et al. 1974)	Site 234. “At the death of Elani, who was greatly beloved by his people, his body was placed on a ledge of rocks near Puaena Point, where it was allowed to decompose. The place became known as Kahakakau Kanaka. As the odor came to the sands at Haleiwa they became known as Maeaea; the pond on the other side became known as Kupava [*sic*; should be Kūpaoa in Pa‘ala‘a]”(McAllister 1933:141-142).
Po‘o o Mo‘o, Wāwae o Mo‘o	stones	Head of the *mo‘o*, foot of the *mo‘o* (Pukui & Elbert)	Site 230. “Two stones known as moo [supernatural creatures], on either side of the Anahulu Stream above the old Haleiwa Seminary. One was named Poo o Moo and the other was known as Wawae o Moo. They are in no way different from ordinary stones, and can not be distinguished from other stones in the vicinity unless pointed out by one of the Hawaiians” (McAllister 1933:141).
Pu‘upilo	*heiau*	hill [of the] swampy odor, or *pilo* [*Coprosma* spp.] plant hill (Pukui et al. 1974)	Site 227. “Puupilo heiau, seaward of the Haleiwa Courthouse, Paalaa. A slight elevation of land with an old coconut palm on the side is all that remains of this heiau” (McAllister 1933:141).
‘Uko‘a	*loko*, pond		Site 236. “It is a long narrow fresh-water pond, approximately a mile in length. . . Laniwahine was the goddess (*moo*) of **Ukoa** and lived there with her brother Puhiula. Between the pond and the sea was a tunnel though which Laniwahine passed when she wished to bathe in the ocean. Offerings were left for her on a stone” (McAllister 1933:142).

3.3.2 Heiau in Pa‘ala‘a

In the 1930s, Gerald McAllister of the Bishop Museum, recorded thirteen sites in Pa‘ala‘a, comprised of the *heiau* of Kamani, Kapukapuākea, Lonoakeahu, Pu‘upilo, Kepuwai, Anahulu, and Hekili, the altars of Punakai and Kumailia unu, the ko‘a (fishing shrine) of Ka‘ohe, the Pōhaku Lana‘i at Kaiaka Point, Kūpaoa Point, a kahuna’s (priest) residence called Punakai, the site of Pā‘aikana enclosure in Halemano, and Laukī‘aha Spring (McAllister: 1933, 132-43). The table below (Table 2) lists and describes these sites. Their presence indicates that Pa‘ala‘a Ahupua‘a was significant in pre-contact O‘ahu.

Kepuwai heiau was in close proximity to the Project area, but little is known about it. “At the mouth of the Anahulu Valley there were three temples, all destroyed. Of Pu‘upilo heiau (site 227) and Kepuwai heiau (228) nothing is known but their names. The site of the latter is now the cemetery of Emerson’s church, a noteworthy transformation of ritual use” (Kirch 1992:19). Although Kepuwai was mentioned by McAllister, it is not included in the earlier (1906-1909) list of heiau by Thomas Thrum in the Hawaiian Almanac and Annual.

Pa‘ala‘a is especially known for the famous *heiau* of Kapukapuākea which has cross-Polynesian association with voyaging chiefs from Tahiti. Kapukapuākea is the Hawaiian cognate of the famous Tahitian *marae* (temple) of Taputapuatea at Opoa in Ra‘iatea. Presumably, Taputapuatea was the place the Opoa kings were installed. The Hawaiian tradition of Kapukapuākea held a similar function, not only in content but in the implied position between the ancient *ali‘i* of Hawai‘i and warrior gods of the “Oro type” (Sahlins 1992:21). In approximately A.D. 1490, the *‘aha ali‘i* (council of chiefs) chose Ma'ilikukahi, an *ali‘i kapu* who was born at Kukaniloko, to be the new *ali‘i nui* (paramount chief) of O‘ahu. After his paramountship was installed at the *heiau* of Kapukapuakea (Site 225; McAllister 1933:140) in Pa‘ala‘a. Ma'ilikukahi later went on to institute an explicit land division and administration structure: O'ahu was divided into six *moku*-Kona, ‘Ewa, Wai‘anae, Waialua, Ko‘olauloa, and Ko‘olaupoko-that were further divided into 86 *ahupua‘a* and smaller territorial units (Kirch 2010:84-90).

Table 2. Heiau and Sacred Sites in Pa‘ala‘a Ahupua‘a

Place Name	Type	Meaning	Comments
Hekili	*heiau, pu‘uhonua*	thunder (Pukui et al. 1974)	Site 223. Hekili heiau, Pa[a]laa-uka, on the sea side of the twin bridges at Waialua. The site is said to be occupied by the Buddhist temple (TMK 6617:10). Thrum was told that the *heiau* was of *luakini* class and a place of refuge. Near the heiau was a fishing shrine known as Kaohe, according to Hookala (McAllister 1933:140).
Kamani	*heiau*	a large tree (*Calophyllum inophyllum*) (Pukui & Elbert 1986)	Site 231. Anahulu heiau, Kamani, at the location of the present [1932] Haleiwa Hotel. When the hotel was being built the heiau was destroyed. This, according to the Hawaiians, accounts for the failure of the hotel. According to Thrum it was an "Unpaved heiau of large size with limestone walls, of luakini class" (McAllister 1933:141).
Ka‘ohe	*ko‘a* (fishing shrine)	the bamboo (Pukui et al. 1974)	Site 223. “Hekili heiau, Pa[a]laa-uka... Near the heiau was a fishing shrine (ko‘a) known as Kaohe..." (McAllister 1933:140).
Kapukapuākea	*heiau*		Site 225. Kapukapuakea heiau, Paalaa-kai, east end of Kaiaka Bay, on the sea side of the railroad track. The site is still remembered and pointed out, but nothing remains of the heiau. Thrum has this information: "A medium sized heiau of traditional menehune construction of kauila wood” (McAllister 1933:140).
Kuaikua	place		"Kuaikua is located up in Halemano. It has a sacred spring and only those related to the supernatural ones who made and hid it, are allowed to bathe in it" (Sterling and Summers 1978:112).

Place Name	Type	Meaning	Comments
Kukui‘ula	altar	red light (Pukui et al. 1974)	Site 224. “Punakai, Waialua... There is also said to have been an unu here by the name of Kukuiula" (McAllister 1933:140).
Kumailiaunu	altar		Site 222. “Kumailia-unu was located on the sea side of the road just before [south of] the twin bridges in going toward Waialua. Truck gardens occupy the site" McAllister 1933:140.
Laukī‘aha	spring		Site 221. “Laukiaha, the name of a spring once flowing near the present [1932] Waialua Soda Works into the Opaeula stream, on the mountain side of the twin bridges at Waialua" (McAllister 1933:140).
Lonoakeahu	heiau		"Sites not located. 17. Lonoakeahu heiau, Keehu. Listed by Thrum: "A heiau of small size destroyed years ago; site now planted to cane" (McAllister 1933:197).
Pā‘aikanaka	residence	man-eating enclosure (Pukui & Elbert 1986)	Site 220. “Pa Aikanaka, Halemano (Helemano or Halemanu), Paalaa, the site of the famous cannibal feasts of a chief on Oahu, located 8 miles east of Haleiwa in the mountains of Haupu" (McAllister 1933:137; Sterling and Summers 1978:107-112).
Pohaku Lanai	stone		Site 226. “Pohaku Lanai, a large balancing stone on Kalaeoiupaoa Point. A large oval-shaped stone 18 feet across is balanced on a smaller base, standing about 10 feet high in all. This is said to have been used as a lookout by fishermen in the region. When fish were sighted, the stone was beaten with a wooden mallet, and the resulting hollow sound was sufficient to gather together the fishermen of the village." (McAllister 1933:140). "The Hawaiians say it was a stone which floated from

Place Name	Type	Meaning	Comments
			Kahiki" (Sterling and Summers 1978:113).
Punakai	residence		Site 224. “Punakai, Waialua. A kahuna named Puukane lived at this place, which was known as Punakai. Whenever Puukane chanted, the poi would overflow any vessel in which it had been placed. There is also said to have been an unu here by the name of Kukuiula" (McAllister 1933:140).
Pu‘upilo	heiau	hill [of the] swampy odor or pilo plant hill (Pukui et al. 1974)	Site 227. “Puupilo heiau, seaward of the Haleiwa Courthouse, Paalaa. A slight elevation of land with an old coconut palm on the side is all that remains of this heiau" (McAllister 1933:140).

3.3.3 Loko Pu‘uone

Loko pu‘uone are brackish, sand banked ponds near the shore connected to the sea by a stream or ditch (Pukui and Elbert 1986). In Hale‘iwa are two spring-fed *loko pu‘uone* that are connected. The larger is ‘Uko‘a Pond (approximately 25 acres) and the smaller pond is Loko Ea (less than ten acres). These have been a valuable aquacultural resource. Cultivated fish include *‘ama‘ama, āholehole, ‘o‘opu,* and *moi* among others (Wyban 1992:27-40). The unique ecosystem the ponds form has also been home to waterbirds such as the *‘alae ‘ula* (Hawaiian mudhen) and ‘alae ke‘oke‘o (Hawaiian coot), ‘auku‘u (black-crowned night heron) (Wyban 1992:26). Kamehameha encouraged both commoners and ali`i to farm and fish and “he himself would fish and continue his laborious efforts at carrying rock or timber” (McKeague, 2002: 23). He worked to restore Kawailoa’s Uko`a pond. Kamehameha II-Liholiho also stayed at Waialua before heading to Kaua‘i to meet with Kaumuali‘i, accompanied by his five wives, Keouolani, Ka‘ahumanu, and several chiefs and favorites. They stayed there inorder to enjoy the fat mullet and catch *‘āholehole* fish.

These ponds were controlled by *ali‘i* and were associated with three *‘aumakua* (gods, deified ancestors) who protected the ponds, produced generous amounts of fish, and took care of the health and well-being of the *‘ohana* of Wailua. They are Niukala the shark god, Puhi‘ula the eel god, and the most well-known is Laniwahine, the *mo‘o* whose forms include lizard and woman.

> Laniwahine was the guardian (kia'i) of 'Uko'a at Waialua, and 'Uko'a was regarded as the long house (hale hālau) where she lives. She was a native of 'Uko'a and all her deeds centered about that place. The "native sons" (keiki kama'aina) of 'Uko'a never failed to recognize her deeds, but few of her

> descendants are now left or perhaps none. 'Uko'a was a very strange fishpond in which lived extraordinary fishes. A fish might be a kumu fish on one side and on the other side a mullet; or on one side weke pueo, and on the other mullet; or on one side might be a silver white like a white cock; when scaled, the skin might be stripped and variegated inside. It was clear to all her descendants that these strange fish belong to Laniwahine and it was not right to eat them. But the mullet of 'Uko'a were full of fat, when, as in all such pond, the native guardian of the pond was remembered. (Kamakau 1991:84)

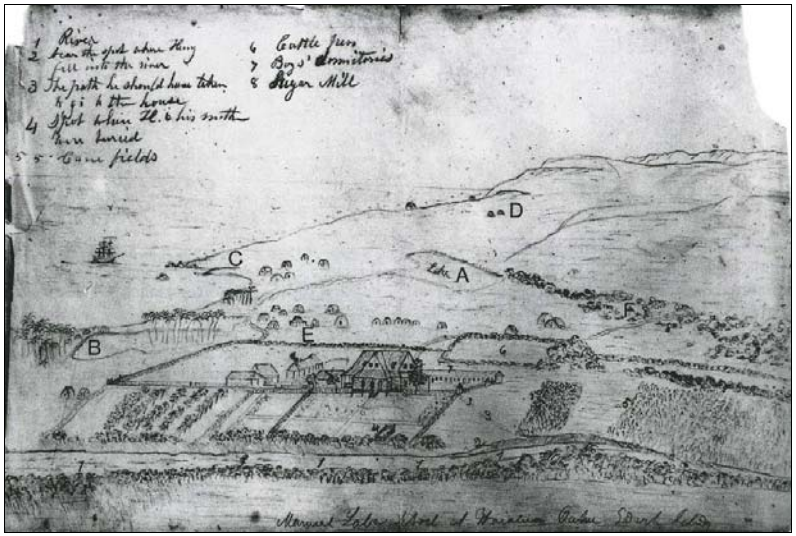

Figure 6. Lower Anahulu River, 1842 or 1853, sketch by Edwin Locke, showing fishponds of 'Uko'a (A) and Lokoea (B), Pua'ena Point with its small settlement (C), the fishing hamlet of Kapaeloa (D), a set of homes belonging to Nauahi *ma* (Nauahi folks; *maka'ainana*) with irrigated taro fields (E), and an area of sweet potatoe, gourd, and mellon cultivation (F) (cited in (Sahlins 1992:174).

Figure 8. Aerial photograph with important cultural and natural features

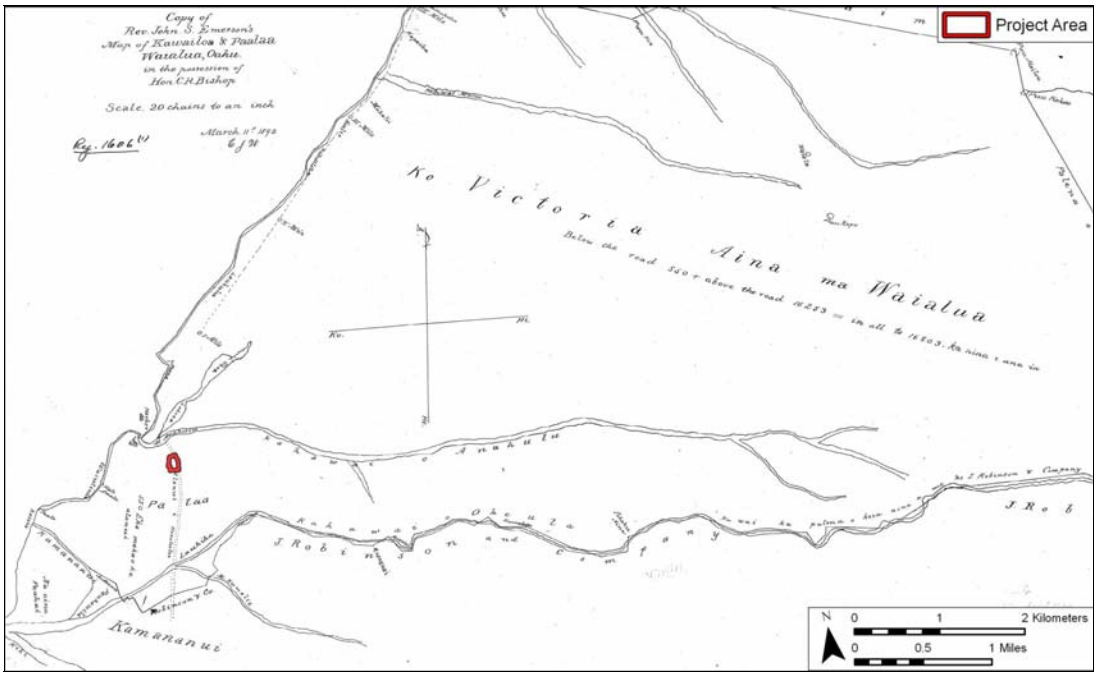

Figure 7. 1892 map of Kawailoa, Pa‘ala‘a and Kamananui in the Waialua District by John Emerson (Registered Map No. 1606, part 1, Hawai‘i Land Survey Division)

3.3.4 Mele and Mo‘olelo of Waialua

3.3.4.1.1 Mele and Oli

According to Kamakau, the birth of Kapawa marks the importance and memorialization of the birth place of chiefs. Kapawa was the son Nanakaoko and it is with him that a special birthing place for chiefs was established. This place is Kūkaniloko, Wai‘alua O‘ahu. The oli *‘O Kapawa, ‘o ke ali‘i o Wai‘alua* speaks about the birth and early life of Kapawa. It also mentions important wahi pana in the Wai‘alua area and makes a connection to important chiefly sites on the island of Māui. (Kamakau, 1991: 136-37)

‘O Kapawa, ‘o ke ali‘i o Wai‘alua	*Kawapa, the chief of Wai‘alua*
I hanau i Kūkaniloko;	*Was born at Kūkaniloko;*
‘O Wahiawā ke kahua;	*Wahiawā the site;*
‘O Līhu‘e ke ēwe,	*At Līhu‘e the placenta,*
‘O Ka‘ala ka piko,	*At Ka‘ala the navel cord,*
‘O Kapukapuākea ka a‘a,	*At Kapukakuakea [heiau] the caul;*
O Kaiaka i Māeaea;	*[Heiau] of Kaiaka at Māeaea*
Ha‘ule i Nukea i Wainakia.	*He died at Nukea at Wainakia*
I ‘A‘aka i Hāleu,	*Through [the surf of] ‘A‘aka at Hāleu,*
I ka la‘i malino o Hauola,	*Through the calm stillness of Hauola,*
Ke’lii ‘o Kapawa ho‘i no,	*The chief Kapawa was taken,*
Ho‘i no i uka ka waihona,	*Taken upland [in ‘Īao] for laying away,*
Ho‘i no i ka pali kapu o nā ‘li‘i. . .	*Taken to the sacred pali of the chiefs. . .*
He kia‘i Kalāhiki no Kaka‘e.	*Kalāhiki is the “watchman” of [the burial cave called Ka-pela-kapu-o-] Kaka‘e.*
‘O Heleipawa ke keiki a Kapawa,	*Heleipawa was the son of Kapawa,*
He keiki ali‘i no Wai‘alua O‘ahu. .	*A chiefly child of Wai‘alua, O‘ahu. . .*

Waialua is also the subject of the chant “Ke Kai O Waialua.” This chant refers to the waves at Wailua Bay and the place names with in this area. It is said that the sounds of thunderous waves could be heard from the bay up to Wahiawā. (Pukui & Korn, 1973: 33)

Let the sea of Waialua rise,	*A ea mai ke kai o Waialua*
Let the roar echo over the hills,	*Wawa no olelo okoa i pali*,
Rumble like the grunt of the wild pig.	*Nunu me he ihu o ka pua‘a hae la*
Let the rising wave break the leaf form the cliff.	*Ako ka lau o ka nalu pii ka pali,*
Kaiaka cliff stands above the storm,	*Ku pali Kaiaka i ka ino*,
Stormy is the cape of Kukuilaania,	*ino ka lae o Kukuilauania*,
Windy indeed it is.	*He Maka-nui*
The voice of the sea rise upon the wind	*Makani me he ao la ka leo o ke kai,*
Deafening those in the uplands of Lihue,	*Kuli paia wawa ka uka a Lihue*

As it is born over the plain,	*Ome ha okaa i ke kula*
The rumbling of the sea treading upon the plain,	*Ke kula hahi a ke kai e halulu nei*
Rumbling over the Koolau.	*Halulu ma ke Koolau*
Ewa listens,	*Hoolono Ewa*
She has not seen the rising of the waves,	*Aole i ike i ka po ana a ka nalu*
And mistakes it for Wahiawa	*Kuhihewa wale no Wahiawa-e*

This chant and others were used during the time of Kamehameha III. In a speech he made at Honuakaha in Honolulu he proclaimed that Hawai‘i would be a “Government of learning, in which chiefs should teach commoners and each one teach another”. (Kamakau, 1992: 442-423) The use of chant and song exhilarated the people and created a learning environment in which they excelled at unprecedented rates. It is said that the “rhythmical sound of the voices in unison as they rose and fell was like that of the breakers that rise and fall at Waialua or like the beat of the stick hula in the time of Peleioholani and Kalani‘opu‘u”. (Kamakau, 1992: 422-423) The new chants kept the rhythmical sound of the traditional chants and songs and replaces them with new songs like the first two lines *A ea mai ke kai o Waialua (*Let the sea of Waialua rise), with *Mai malamahou in na akua laau* (Keep no more wooden gods) and E huli kākou i ke ‘li‘i ola mau (Turn to the lord of eternal life). This was one of the methods that were used to teach Christianity to the Hawaiian people during this time period.

3.3.4.1.2 Mo‘olelo of Kelea

Lo-Lale was the brother of the high chief of O‘ahu Piliwale, whose court was established at Waialua. Piliwale desired that his brother marry in order to strengthen their court. Kalonaiki, their mother had married Kikinui and “thus infused into the family the native and aristocratic blood of Maweke, of the ancient line of Nanaula”. (Kalakaua, 1990: 232) As a result of the high rank of Lo-Lale, he felt that there was no woman on O‘ahu that he would agree upon to be his wife. His cousin Kalamakua was sent on a mission to find a woman that would be a suitable match. His first stop was at Moloka‘i where he did not find someone to his liking, he then departed for Māui and heard the court of Kawao, the King of Māui, was at Hamakuapoko. He then proceeded to meet with the court when he came across Kelea swimming in the ocean and invited her to ride the canoe into shore. After finding out that she was the sister of the King he invited her yet again for another round of canoe surfing she consented to a second and third ride when a storm came in and carried them out to sea. When the storm ceased Kalamakua knew that she would be a match for his cousin both in rank and beauty and tricked her into coming to O‘ahu. When nearing Waialua he told her of his mission to find a wife for his cousin. After meeting Lo-Lale she agreed to marry him.

Following the marriage of Lo-Lale to Kelea at Waialua, their “nuptials were celebrated with games, feasting, dancing and the commencement of a new heiau near Waialua, which was dedicated to Lono with a large image of Laamaomao . . . at the inner entrance, in poetic commemoration of the winds that drove Kelea away from the coast of Maui”. (Kalakaua, 1990: 240) Kelea was taken to Līhu‘e by Royal procession, the celebrations continued there for many more days, this was the official union of Kelea, sister to the Kawao Mō‘ī of Māui and Lo-Lale, brother of Piliwale the King of O‘ahu. Although this union did not last the couple had three children, one of whom Kaholi married his cousin, Kohipa, the daughter of Piliwale and sister to his successor Kukaniloko. Kelea married Kalamakua the aforementioned cousin of Lo-Lale.

Together they had one daughter Laielohelohe who later became the wife of Piilani. (Kalakaua, 1990:228-246)

3.3.4.1.3 Mo‘olelo of ‘Aikanaka

A traditional account associated with Pa‘ala‘a Ahupua‘a are those of the cannibal chief ‘Aikanaka (lit. “cannibal”, “man-eater”). The many sources for this story (Jarves 1844: 72, Ka Hae Hawai‘i 1861, Kalākaua 1888:369-380, Whittemore 1895, Nakuina 1897:90, Thrum 1904: 179, Westervelt 1904:12, McAllister 1933:137-140, Beckwith 1940:340, Pukui 1953 in Sterling and Summers 1978:111) attest to its notoriety. The story relates that (perhaps circa A.D. 1750), a powerful wrestler and boxer, often said to have been a foreigner, retired with a few followers in the uplands of Pa‘ala‘a (called variously “Halemanu”, “Helemano” and “Halemano”), where they dined on the flesh of hapless travelers until the leader was killed by the brother of a victim. McAllister (1933) placed the area known as the Pā ‘Aikanaka (“Man-eater’s enclosure”) eight miles east of Hale‘iwa but noted that nothing remained.

Section 4 Historical Background

Waialua enters the historic record in 1794 when Ka-‘eo-kū-lani recruited the “warriors of Waialua and Wai‘anae” to make war on his nephew Ka-lani-kū-pule, then ruler of O‘ahu (Kamakau 1992:168); by December 1794 Ka‘eo had been killed and his forces were defeated. Kalanikūpule would himself be deposed the following year when the invading Hawai‘i Island forces of Kamehameha prevailed at the Battle of Nu‘uanu in April 1795. 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.

4.1 Sandalwood Trade

The Hawaiian Islands began exporting sandalwood to the Orient shortly after 1800 and the commerce flourished until the supply dwindled in the mid-1830s. 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 Kauai and from the districts of Waimea and Wai‘anae on O‘ahu (Kuykendall 1965:88).

After Kamehameha’s death in 1819, Liholiho (Kamehameha II) allowed his chiefs to share in the trade, resulting in an unrestrained demand on stocks of the wood and upon the energies of the *maka‘āinana* (commoners) who did the harvesting. Already in October 1817, a Russian visitor on O‘ahu noted: “There are now many fields left uncultivated, since the natives are obliged to be cutting sandalwood” (Barratt 1988:218).

“Traders records from Kamehameha’s last years show several important *ali‘i* trafficking in sandalwood on their own, including...Kalaimoku, Cox, Boki, Ka‘ahumanu, and some others” (Kirch and Sahlins 1992:59). Among these *ali‘i*, Ke‘eaumoku Cox was the Hawai‘i Island chief who had been given control of Waialua by Kamehameha. Diaries and journals of Western entrepreneurs on O‘ahu record the early 19th-century sandalwood-based trade that intruded upon the established mores and customs of the Waialua population. Stephen Reynolds, a clerk for the Honolulu merchant William French, noted in his journal on April 30, 1824:

> Very hot sun—many of the residents [of Honolulu] preparing to go to Wairua [Waialua], some for wood—some to buy hogs, some for pleasure—All the Kanakas of Wairua belonging to Cox who lately died, came up to day—bringing cows, Pigs, Dogs, Fowls & other things, produce of the Country to give to krymakoo [Kalaimoku, the Regent], Kahumana [Ka‘ahumanu], & other principal chiefs—according to the custom of the country. (King 1989:27)

4.2 Pre-Māhele Ali‘i Landownership

Lydia Pi‘ia Namahana, sister of Ka‘ahumanu, retained control of Pa‘ala‘a and the Waialua District by 1827. The previous year, she was already involved in the Waialua sandalwood trade.

Stephen Reynolds' journal entry of October 24, 1826 noted: "Convoy sailed for Wairua to get 400 piculs of wood from Piia [Namahana]—Due from Cox's estate" (King 1989:155).

Namahana's husband, Gideon La‘anui, had been born on Hawai‘i Island and grew up in the train of Kamehameha. La‘anui himself, in his "Reminiscences of Gideon Laanui" published in 1838, described his origins:

> Kamehameha battled against Namakeha, in which the latter was killed, thus ending the war, with Kamehameha victorious [1794]. Then was I born, Hilo being the birthplace, and from birth till the readiness of the peleleu fleet when Kamehameha sailed for Maui. I was five years old on leaving Hawaii with the peleleu for Maui, and lived there [presumably at Lahaina]. While yet a child, though somewhat grown, we moved to Wailuku where was also the king. On going to Lahaina, food was distributed to men and women, consisting of wailau (large leaf bundles of food, as poi, for carrying). We were one year at that place. Then the king came to Oahu on a foreign ship. Brown was the name of its captain. We followed on the peleleu, my parents and I, and landed at Waikiki. (La‘anui 1929:86)

Elizabeth Pratt, La‘anui's daughter (by his second wife, Teresa Owana), records that it was Kamehameha himself who arranged La‘anui's marriage to Namahana:

> Among the visitors to the royal court was Kekuwai-Piia [Namahana], who had just become a widow, coming as a guest of her sister, Queen Kaahumanu. Laanui was a boy growing to maturity. The king had not forgotten the great wish of his heart, coveting possession of Waimea and hoping to gain it, if not in battle, through a matrimonial alliance...[Now] he chose a new agent of his ambition by inviting Laanui to the court. The invitation was gladly accepted and the visit lasted for months. Kamehameha was loath to have Laanui depart while he was still slyly intriguing with Kaahumanu to negotiate a marriage between Piia and Laanui. Piia is described as being a person heavily built and not prepossessing in appearance like her sisters Kaahumanu and Kaheiheimalie. When at last the proposition was put squarely to Laanui, that it was the united wish of the king and queen that the marriage should take place, for a moment he was dejected. To wed a woman very many years his senior was not the desire of his heart. Yet realizing that it might be perilous to go contrary to the express desire of the powerful monarch he quietly consented "to take the bitter pill." (Pratt 1920:46)

La‘anui's own words (given in testimony to the mid-nineteenth century Land Commission) reveals how he and his wife came to reside at Waialua and tells of his land interests in Pa‘ala‘a:

> My wife Kuaipua [Lydia Namahana Kekuaipi‘ia] is the foundation [*kumu*] of my claim here at Waialua, and I have truly become a *kama‘āina* here, like the native children of the place [*a lilo maoli i kamaaina no o nei, me ke keiki papa la*]. After I had been living at Waialua for a little while with Kekuaipiia, the *‘ili* (land section) of ‘Uko‘a became hers—that is at Kamananui—along with Kalopa [Kalaopa], the two of them. Ka‘ahumanu asked Ke‘eaumoku [Cox] for Lokoea and he consented it be given to Piia and she gave me [*a haawi a Piia ia‘u*] Ukoa,

> Lokoea and Kalopa in [the *ahupua‘a* of] Kamananui. When Ke‘eaumoku died in 1824, Ka‘ahumanu gave Piia Waialua, from one point to the other, just for her support [‘food',*kona ai io nae*], and Kawailoa from the sea inland to the mountain and one side to the other, excepting the *kus* [*‘ili kūpono*]. Piia then said to me: Your land is Kawailoa, from upland to the sea and one side to the other, I retain no *ku* within it; I give it to you, together with the two *‘ili* at Paalaa and the six *‘ili* at Kamananui. ‘Uko‘a and Lokoea are to be joined with the *ahupua‘a* of Kawailoa. This Piia spoke to me. (in Kirch and Sahlins 1992:95)

La‘anui was living at Kawailoa, adjacent to Pa‘ala‘a, in 1832 (Namahana had died in 1829) when the Rev. John S. Emerson (1800-1867) and his wife arrived at Waialua Bay to establish a mission station in the Waialua district; Emerson reported in a letter:

> The wind was against us as we entered the harbor at Waialua, and we were obliged to "beat in." As soon as we approached the land, La‘anui, our chief, came alongside in a canoe to welcome us, presenting us with a good watermelon, of which we ate freely and were at once relieved of our seasickness. (Emerson 1928:55)

Emerson gave the name "Haleiwa" (home of the frigate bird) to their settlement. Emerson's son, Oliver Pomeroy Emerson, recounts an episode revealing the authority La‘anui possessed within Waialua:

> The new [meeting] house [at Waialua] was opened for the first time for dedication and public worship 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 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‘anui had issued positive commands that everyone in the entire district of Waialua should attend this service under threat of severe penalty...When La‘anui 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 La‘anui that he should not force the 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. Censuses taken 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). These early censuses do not record the specific Pa‘ala‘a Ahupua‘a population figures.

By 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 victual 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)

4.3 The Māhele (division of Hawaiian lands)

Toward the mid-19th century, the Organic Acts of 1845 and 1846 initiated the process of the Māhele (the division of Hawaiian lands), which created a new system of land ownership in Hawaiian society. In 1848 the crown, the Hawaiian government, and the *ali‘i* received their land titles. Originally the entire district of Waialua was awarded to Victoria Kamāmalu, sister of Alexander Liholiho (King Kamehameha IV) and Lot Kamehameha (King Kamehameha V). She ceded the lands from Kamananui to Ke‘ena (the western section of Waialua), which became government lands, but she kept the *ahupua‘a* of Pa‘ala‘a and Kawailoa (Land Commission Award 7713, *‘Āpana* 34). Within these two *ahupua‘a,* 134 Hawaiians received land and at least 24 people claimed lands that were not awarded (Kirch and Sahlins 1992:167). Most of these lands were located along the lower river valleys and at the wetlands near the coast. The most productive taro land was near the coast in an area called Kawailoa Kai and Pa‘ala‘a Kai.

Kuleana Awards for individual parcels within the *ahupua‘a* of Pa‘ala‘a were subsequently granted in 1850. These Land Commission Awards (LCAs) were presented to tenants—native Hawaiians, naturalized foreigners, non-Hawaiians born in the islands, or long-term resident foreigners—who could prove occupancy on the parcels before 1845. Of the Kuleana Claims made in Waialua District only “the people of Kawailoa and Pa‘ala‘a saw through their claims before the Commission” (Kirch and Sahlins 1992:18). There were 77 claims made for Pa‘ala‘a; 64 of these were awarded. Locations of the Pa‘ala‘a Land Commission Awards (LCAs) are shown on two historic maps, one made in 1883 (Figure 9) and one made in 1900 1 presents data in the LCA records for Pa‘ala‘a awardees.

As the map indicates, the Pa‘ala‘a and Kawailoa kuleana parcels form a broad cluster around the present Project area. Information from Māhele documents presented in Table 3 indicates that the majority of parcels in the Pa‘ala‘a-Kawailoa coastal taro lands comprise taro *lo‘i* (irrigated fields) with associated house lots. Figure 10 highligts three parcels—LCA 2907 to Keawe, LCA 7408 to Kawahamana and portions of LCA 9951 to Laanui—located adjacent to the present Project area. The three parcels may not accurately reflect the pre-contact population and land usage within this particular portion of Pa‘ala‘a Ahupua‘a. However, documents associated with

the three awards may give clues to the character of land use nearby the present Project area in the mid-1850s.

In records for LCA 2907 to Keawe, the area is described as consisting of nine *lo‘i,* a water course and the site of his house. His property was at Ou in Kawiloa Kai. He also had a *lo‘i* and a *pali wauke* at Kawailoa waena. In Native Register records for LCA 7408 to Kawahamana, the lands that he claims is traced back to three previous occupiers. Kawahamana was given the land by his makua, previous to that Kekauwa had these lands who had received it from Kahalau. In addition to the lands traced through these previous occupiers, Kawahamana expresses a desire to combine the *lo‘i* from Kekauwa which is bound on the north side of the lands.

In LCA 9951 to Laanui, he claims the *ahupua‘a* of Kawailoa and well as eight *‘apana*: two in Pa‘ala‘a and six in Kamananui. In Native Register .494-496v4 Laanui’s claim to the Land Commissioner is as follows: ‘Apana1, 4 and 6 are visble in and are within the OHA boundries of Pa‘ala‘a but are listed by La‘anui as being within Kamananui. Laanui states that, “the right was to be mine and the two ‘ili and Paalaa and the six ‘ili and Kamananui, also, Ukoa and Lokoea are included in Kawailoa” (Native Register .494-496v4).
Apana 1. Ili o Kalaopa ma Kamananui.
Apana 2. Ili o Kalehunui.
Apana 3, Ili o Kamahu 1.
Apana 4, Ili o Kamahu 2.
Apana 5. Ili o Kamahu 3.
Apana 6. Ili o Kuanopili.
Apana 7. Ili o Laukihaa ma Paalaa.
Apana 8. Ili o Waikaalulu ma Paalaa.
Apana 9. Ahupuaa o Kawailoa. (Native Register .494-496v4).
Laanui was awarded the eight *‘apana* that he petitioned for to the Land Commission. In Royal Patent 6296, he was not awarded *‘apana* 9, the Ahupua‘a of Kawailoa. There appears to be descrepencies between the LCA Registers and the Royal Patent Awards as to the specific locations of each *‘apana*. *‘Apana* 1 and 4 appear to be located in Kawailoa not Kamananui; however, the illegibility of the Royal Patent makes the specific place names for each claim uncertain.

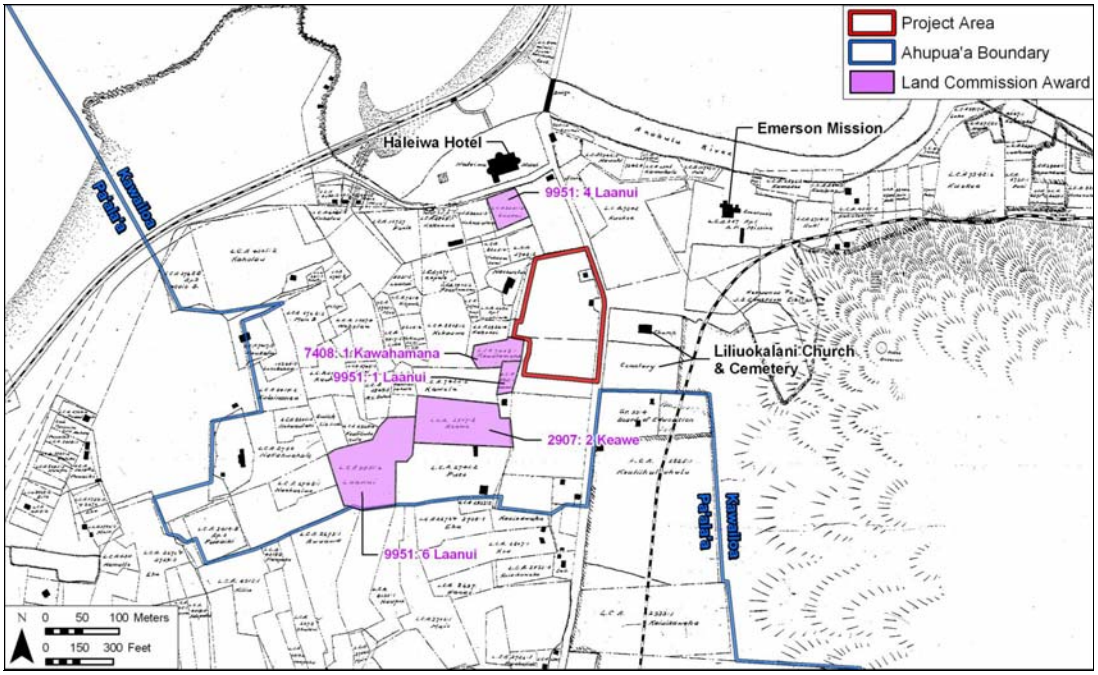

Figure 10. 1900 Waialua Agricultural Company Map of Lands at Paalaa by W.A. Wall, showing Land Commission Awards in the Vicinity of Present Project Area (Registered Map No. 2055, Hawai‘i Land Survey Division)

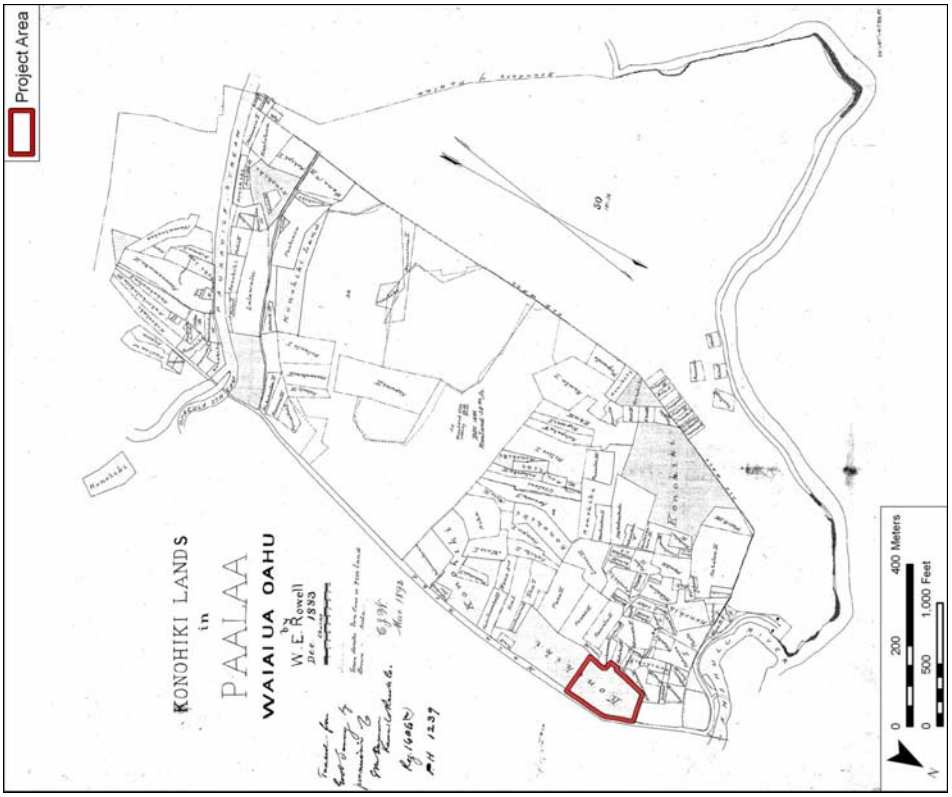

Figure 9. 1883 map of Pa‘ala‘a Lands by W. E. Rowell, depicting Project area within lands for the *konohiki* (land manager) for the Victoria Kamāmālu estate

Claim #	Claimant	*‘Ili*	*Ahupua‘a*	Land Use/ Landscape feature(s)	Amount Awarded (n.a.=not awarded)
				salt *ko‘ele*	
2807	Koa	Aakala Hanauewa	Pa‘ala‘a	15 *lo‘i*	2 *‘āp.*; 1.79 Acs.
2862	Kamano no Kaopukonahua	Kealapi‘i	Pa‘ala‘a		3 ‘āp.; 0.77 Acs.
2907	Keawe	Keokea, Ukoa, Ou	Kawailoa, Kawailoa waena	9 *lo‘i* by a watercourse, one houselot, 1 *pali wauke*	6 *‘āpana*; 3.4 Acs.
2925	Keliihuluhulu	Poopohaku, Haehae, Hanaewa, Aakala, Aeikala	Kawailoa, Pa‘ala‘a	Land, house lot, 6 *lo‘i* stream, watercourse, *muliwai*	2 *‘āp.*; .69 Ac. 1 ‘*āp.*; 9.06 Acs. 1 *‘āp.*; .69 Ac. .46 Ac.
2926	Kahakai	Ukoa, Koheo, Oio, Ainaiki, Keae, Pahui	Kawailoa	5 *lo‘i,* 1 *kula*, *loko ‘ai* (pond) for taro and fish, 1 houslot, claim to sweet potatoes in communal lot, 1 *wauke pali*, one *mala* (garden) for gourd, one *mala* for sweet potatoes, fishing rights to ‘*o‘opu* (gobies), *‘opae*	4 *‘āpana*; 3.15 Acs.

Table 3. Land Commission Awards on the Pa‘ala‘a and Kawailoa Boundry near Project Area

Claim #	Claimant	*‘Ili*	*Ahupua‘a*	Land Use/ Landscape feature(s)	Amount Awarded (n.a.=not awarded)
2673	Awaawa	Kapaaloa	Pa‘ala‘a	7 *lo‘i* (40 *lo‘i*),house lot Gov’t road, road	2 *‘āp.*; 3.51 Acs.
2676	Ehu	Hanauewa Aakala	Pa‘ala‘a	7 *lo‘i*, 1 *lo‘i*, *kula* watercourse	3 *‘āp*; 5.08 Acs.
2692	Luahiwa	Anahulu, Kawailoa	Anahulu, Kawailoa	Claim to sweet potatoes on communal lot	4 *‘āpana*; 1.18 Acs.
2741	Pueo	Kalualepo, Konohikilau, Ukoa, Puana	Kawailoa		3 *‘āpana*; 6.51 Acs.
2748	Naahuelua	Kolea, Kapiheakamalii, Puaena	Kawailoa Kai	12 *lo‘i* & watercourse, *kula*, claim for sweet potatoes in communal lot, houselot at Puaena	4 *‘āpana*; 6.26 Acs.
2749	Nakahuahale	Kaimakole	Kawailoa		1 *‘āpana*; 3 Acs.
2768-B	Maio Mooni, wife	Anahulu lalo, Koheo	Kawailoa, Anahulu	3 *lo‘i* & *kula* long *lo‘i* house site outside Pa‘ala‘a	3 *‘āp.*; 2.07 Acs. (see2768B Kawailoa land)

Claim #	Claimant	*‘Ili*	*Ahupua‘a*	Land Use/ Landscape feature(s)	Amount Awarded (n.a.=not awarded)
				80 l*o‘i* & *pali* road, ‘*auwai*,stream, *pali*	
7408	Kawahamana	Koheo	Kawailoa	2 *lo’i* near a watercourse, 1 houselot	2 *‘āpana*; 0.78 ac.
8095	Haupu	Aakala Kapaaloa	Pa‘ala‘a	1 *lo‘i, kula* house lot, stone wall	2 *‘āp*.; 1.47 Acs
9951	Laanui, Gideon	Kalaopa, Kalehunui, Kamahu 1, 2 & 3, Kuanopili, Laukihaa, Waikaalulu	Kawailoa, Pa‘ala‘a	*‘Ili*	(Kawailoa 8 *‘āp*.; 7.95 acs)

Claim #	Claimant	*‘Ili*	*Ahupua‘a*	Land Use/ Landscape feature(s)	Amount Awarded (n.a.=not awarded)
				(freshwater shrimp), *limu kala* (surgeonfish), and *‘anae* (mullet) at certain times of the year	
2933:1 & 2	Kaiakawaha	Aakala, Kuleana, Hanauewa	Pa‘ala‘a	5 *lo‘i*,4 *lo‘i*, house lot Watercourse, government road	3 *‘āp*.; 6.2 Acs.
3414B	Puaaiki	Kolea	Kawailoa, Pa‘ala‘a	house lot	2 *‘āp*.; .72 Acs. also awarded land in Kawailoa
3706	Maio		Pa‘ala‘a	house lot	n. a. See award 2768
4305	Kahalau	Niuula	Kawailoa		1 *‘āp*., 5.94 Acs.
4311	Kamalie	Kumaile, Keakahuna, Hanauewa	Pa‘ala‘a	1 *lo‘i*, house lot	1 *‘āp*..42 Acs.
4312	Kilioe	Hanauewa, Keone, Kahakahuna	Pa‘ala‘a	6 *lo‘i* in 2 *‘āpana*, house lot shore fishery	2 ap. 3.45 Acs.
4318	Kalapaku	Kapaaloa, Kapuai, Opaeula	Pa‘ala‘a, Pa‘ala‘a uka	4 *lo‘i* 3 *lo‘i*	5 *‘āp*.; 5.3 Acs

4.4 Economic Shifts – Whaling, Railroads, Agriculture

In 1850, the first road from Honolulu to Waialua was built. This facilitated changes to the economic, social, and environmental landscapes.

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 focused primarily on supplying whale ships during their long layovers in the islands. With the dwindling of ship arrivals during the 1860s, the populaces 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, Pa‘ala‘a and Kawailoa Ahupua‘a. In 1853 a total of 1,126 persons was recorded in Waialua. Nineteen years later, in 1872, the total district population had dropped to 851 (Schmitt 1977: 12-13).

Following the death of Victoria Kamāmalu in 1866, Pa‘ala‘a Ahupua‘a, along with her many other land holdings, was passed on to successive members of the *ali‘i*, ending up being part of the Princess Bernice Pauahi Bishop Estate (i.e. Kamehameha Schools):

> [Kamāmalu’s] entire estate was inherited by her father, Kekūnao‘a. He died two years later and the estate went to Kekūnao‘a’s son Lota Kapuāiwa, who by that time reigned as Kamehameha V...Kapuāiwa died intestate in 1872, whereupon Ruta Ke‘elikōlani, Kapuāiwa’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 diaries of Robert C. Perkins, an entomologist and ornithologist, who collected specimens in the Waialua District in 1892-1893, reveal aspects of life in the area 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 there after fulfilling their contracts with the sugar plantations that had brought them to the Hawaiian Island (the first 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, 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...

> 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. (Coulter and Chun 1937: 11)

By 1892 there were 180 acres under cultivation of rice in the Waialua District (Coulter and Chun, 1937: 21). A map of rice farming areas of O‘ahu in 1892 shows the Waialua rice fields extended from Kamananui Ahupua‘a, across Pa‘ala‘a Ahupua‘a, to Kawailoa Ahupua‘a (Coulter and Chun, 1937:12). The map indicates that the present study area was probably part of the Pa‘ala‘a rice fields.

In addition to agricultural changes, western entrepreneurial interests would also alter the Pa‘ala‘a landscape. The Oahu Railway and Land (O.R.&L.) Company, organized by Benjamin Dillingham in 1889, connected outlying areas of O‘ahu to Honolulu. During the last decade of the 19th 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).

Capitalizing on the increasing numbers of visitors to the north shore of O‘ahu who journeyed on his railroad, Dillingham opened the two-story Haleiwa Hotel at Waialua Bay in Pa‘ala‘a Ahupua‘a, in 1899. The hotel was built at a cost of more than $50,000 on land leased from the Bernice Pauahi Bishop Estate. The hotel’s name—Hale‘iwa—eventually identified the area above the bay and the “town” there, which then comprised only the hotel, a church and a courthouse. The Hale‘iwa Hotel continued to operate in the first decades of the 20th century. It was taken over by the U.S. Army in the 1930s, serving as a center for recreational activities by military personnel in Hale‘iwa during World War II.

The development of a railroad system also spurred the development of large-scale sugar farming in Waialua. Sugarcane had been first cultivated at Waialua earlier in the century by the missionary John Emerson who constructed a small mill to produce sugar and molasses. During subsequent decades, other missionaries and western entrepreneurs continued expanding—though still on a small scale—sugar cultivation in the district. Benjamin 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.

Waialua Agricultural Company (later named Waialua Sugar Company) continued to expand during the first decades of the 20th century, eventually reaching more than 12,000 acres, including portions of Pa‘ala‘a Ahupua‘a which were leased from the Bernice Pauahi 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).

Into the 20th century, rice continued to be cultivated in Pa‘ala‘a and Kawailoa portions of the Waialua District and in other areas within the Hawaiian Islands. However:

> Rice farming went into a steady decline for several decades before phasing out almost completely just before the beginning of World War II. In 1921, Hawai‘i

> exported seven hundred thousand pounds of rice as compared to the ten million pounds produced at its height in 1890. In 1929 there were only twenty-five hundred acres of rice grown in Hawai‘i by less than seven hundred laborers, nearly five thousand laborers less than in 1903 when there were 5,643 rice planters. (Chong 1998:53)

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 developments 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 developments created the demand for labor, services, and associated constructions, which led to a further increase in population.

The war in the Pacific had been over less than a year when on April 1, 1946, an earthquake off the Aleutian Islands at about 2:00 a.m. (Hawaiian time) generated the tsunami (tidal wave) that reached the Hawaiian Islands about four hours later. The Hawaiian Islands were devastated; at least 150 people were killed, and more than $25 million in property damage was inflicted. 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).

In 1984 the City and County of Honolulu established the Haleiwa Historic, Scenic and Cultural District, mandating preservation rules and new construction constraints for Hale iwa Town. The present Project area was probably under sugar cultivation till residential use around the 1930s. Based on oral history information the Waialua Agricultural Company had this parcel, possibly with a "motor pool" type facility. The Ohama family used the parcel for a gas station and residential occupation till around 1954 (*per. comm.* Ms. Laura Takahashi, Fritz Johnson Architects). The parcel has been utilized as a residence, without the gas station operating, since 1954.

Section 5 Previous Archaeological Research

Twentieth century archaeological findings from inventory surveys, data recovery projects, and inadvertent finds during development are the main source of our knowledge about the archeological record in Pa‘ala‘a. Archaeological work in the last twenty years in Pa‘ala‘a has not been very extensive. This work has been mainly concentrated along the seaward margins of Pa‘ala‘a Kai. This is largely due to the fact that most of the *makai* portions of the *ahupua‘a* had been developed as housing prior to the implementation of State and Federal Historic Preservation Rules. For a detailed listing, see Archaeological Studies in Pa‘ala‘a Ahupua‘a and Hale‘iwa in Appendix E

A number of archaeological investigations have been conducted in the general vicinity of the Project area: McAllister (1933), Beggerly and Yent (1977), Yent (1981), Mitchell (1985; 1995), Frankhauser (1987), Simons (1988), Moore et al. (1993), Dagher (1999), Hammatt and Shideler (2001), McDermott et. al. (2001), and Tulchin et al. (see Table 2 and Figure 5).

In the 1930s, Gilbert McAllister (1933) undertook the first comprehensive survey of archaeological sites on O‘ahu. He identified 13 sites in the Pa‘ala‘a area including major *heiau*, Pōhaku Lanai, Mo‘o stones, the Akua stone, as well as other significant features.

During the Beggerly and Yent (1977) project, ten core samples were taken at Kaiaka Bay Beach Park. The samples revealed no traces of any cultural material. Prior to 1900, the Project area had been modified for military and agriculture uses and could be a reason for such results. Also the area had been disturbed by artifact hunters (Mitchell 1985).

In 1979, Chiniago, Inc. conducted a cultural resources survey of the Kamehameha Highway Re-Alignment in Hale‘iwa, near the Anahulu River, on the *mauka* side of the present Kamehameha Highway. Four archaeological sites were recorded: Site 1439, a historic deposit; Site 1440, a wall remnant; Site 1441, a series of agricultural terraces; and Site 1443, an old church. Sites 1439 and 1440 were devoid of cultural materials, while Site 1441 was interpreted as a remnant of an old wetland taro terrace system.

In 1981, Martha Yent did an archaeological inspection of the lands adjacent to Kaiaka State Recreation Area. She noted an eroding cultural deposit along the northern coastline of the peninsula. Previous bulldozing damage had disturbed the deposit, which was mainly historical, dating back to the late 1800's and early 1900's (bottle glass, cut class, ceramics, and earthenware). The materials evident on the surface were the remains of plantation workers in the Waialua area around 1900.

In 1985, an archaeological subsurface and surface reconnaissance survey of Pōhaku Lana‘i (50-Oa-D5-6) took place at Kaiaka State Park on Kalaeoiupaoa Point (Mitchell 1985). Pōhaku Lana‘i is an oval coralline stone that rests upon a foundation of coralline rock forming a sort of overhang.

A reconnaissance survey was done of the Helemano upland region in 1987 by the Bishop Museum for a proposed sewer trunk line (Frankhauser 1987). The survey included subsurface testing of eight areas of Helemano. No significant prehistoric archaeological sites were found, but an earth oven was found immediately outside the survey area. Any surface sites along the Project area were destroyed by either cultivation of pineapples or road building.

In 1988, the Bishop Museum (Simons) undertook an archaeological testing and monitoring project for the Hale‘iwa McDonalds, which led to the discovery of two rock shelters, a historic mango tree, and historic wall feature. All of these features were located outside the Project area and no subsequent research was done.

The most extensive and significant archaeology that has been done in the Waialua region was organized by Kirch and Sahlins (1992) in what was called the “Anahulu Valley Research Project” (Anahulu, the valley directly bordering Pa‘ala‘a Kai). In 1971, Marshal Sahlins and several staff members of the Bishop Museum began investigating local Hawaiian Society and Economy in the late prehistoric and early historic periods. Archaeological investigations in the Anahulu Valley were first undertaken in 1974 and 1976. In 1979, Kirch surveyed the Anahulu Valley archaeological remains and excavated two significant habitation sites and in 1974 and 1976, eight more archaeological sites were identified and described, including two burial caves, five overhanging rock shelters, and a terraced habitation complex. Kirch and Sahlins defined the proto-historic settlement pattern in Waialua District as follows:

> Four main zones of taro irrigation had been developed on these alluvial lands [of Waialua] Handy (1940:85) refers to “large terrace areas along the flatlands between the junction of Helemano and Poamoho Streams and the flatland west of Poamoho.” One of these zones has been totally obliterated by the Waialua Agriculture Company mill and town (Handy and Handy 1972:465). This was the pond field system water by site 208, described by McAllister as “the longest irrigation ditch of which there is any memory” (1933:133; see also Handy 1940:85-86). This ditch or canal, which evidently tapped Kaukonohua Stream about 3 km inland, was later cemented in and used for many years by the plantation. In addition to the main irrigation complexes shown in figure 1.7, there were smaller pond field systems adjacent to the streams as they followed their incised valley courses inland. (Kirch and Sahlins 1992:17)

In 1995, Rudy Mitchell authored a report discussing the significance of Kapukapuākea Heiau, which was thought by some to have located at Kaiaka State Park, at the coastal area of Pa‘ala‘a Kai. Mitchell recognized the apparent similarities between names from the Kapukapuākea Heiau (one in Pa‘ala‘a Kai and another on Molokai) with Taputapuātea Mārae on Ra‘iātea in the Society Islands. (Other possible locations for Kapukapuākea Heiau have also been proposed and there is no definitive evidence for its location.)

In 1999, Cathleen Dagher a Staff Archaeologist at SHPD responded to the inadvertent discovery of isolated human skeletal remains on Bishop Estate Land in Hale‘iwa, very near the current Project area. The remains consisted of an isolated cranium on the surface of a sand pile. The sand fill consisted of bits of rusted metal, coral, marine shell, and organic materials, but no other skeletal remains were present. There was no archaeological context for the deposit, however the cranium was identified to be “possible native Hawaiian” and of female gender, over fifty years at the time of death.

In 2000, CSH conducted an archaeological inventory survey and limited subsurface testing of a 5-acre shoreline parcel of Hale‘iwa Ali‘i Beach Park, during which Site 50-80-04-5850 was identified (McDermott et al. 2001). Site 50-80-04-5850, a subsurface cultural layer, is a buried sand A-horizon containing traditional Hawaiian habitation remains such as charcoal, food

remains, artifacts, a human burial, and combustion features such as earth ovens. Based on recovered artifacts, food remains, and C^{14}-dating results, this habitation dates to the prehistoric period between A.D. 1430 and 1680. In addition to Site -5850, preliminary historic background research revealed that at least one historic property was located in the current Project area. Site 50-80-04-5791, the right-of-way for the former O.R.&L. railroad, is believed to lie in the immediate vicinity. This railroad was constructed in the last decade of the 19th century and continued operations until World War II.

CSH completed a burial treatment plan and presentation for the Native Hawaiian burial and cultural layer (Hammatt and Shideler 2001), Site 50-80-04-5850, located on the southwest side of Hale‘iwa Ali‘i Beach Park. Following the directions of the SHPD Burials Program, all skeletal remains were returned to the immediate vicinity of the burial pit, and the trench was backfilled and monitoring was recommended for any subsurface construction activity.

In 2003, CSH conducted an archaeological assessment of a 0.6-acre portion of Hale‘iwa Ali‘i Beach Park (Tulchin et al. 2003). No surface historic properties were identified and monitoring was recommended for any subsurface construction activity.

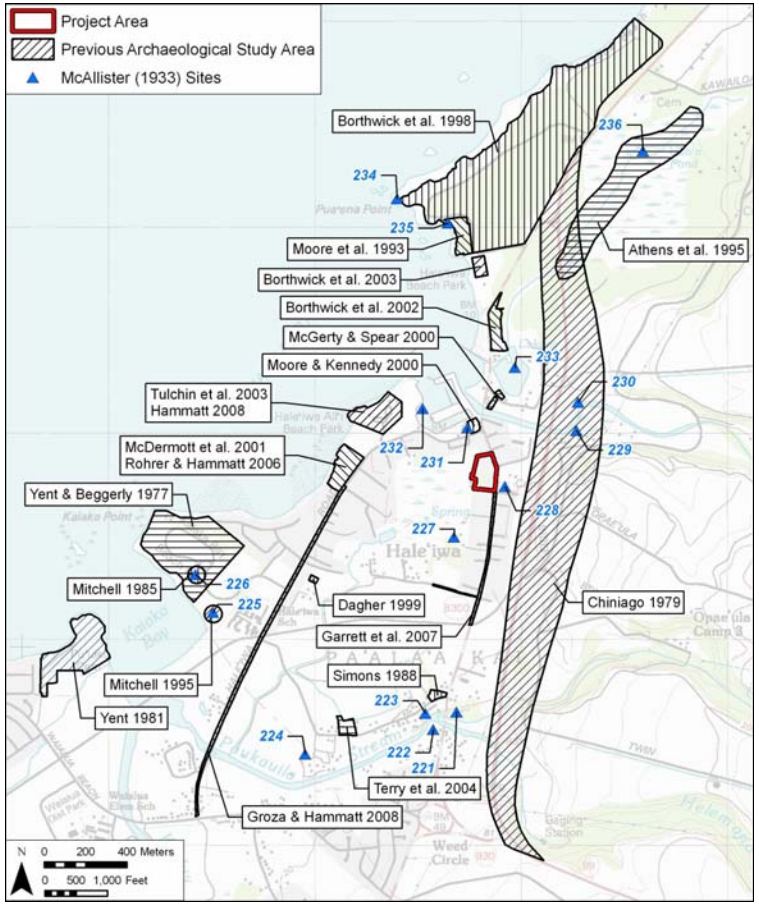

Figure 11 Previous archaeological study areas, with sites identified by McAllister (1933), in Pa‘ala‘a and the Hale‘iwa vicinity (base map. 2009 U.S.G.S., Haleiwa Quadrangle)

Section 6 Previous Oral History Research

In 1976, the Ethnic Studies Program at the University of Hawaii 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:vi). Wailua and Haleiwa 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 Manabu Nonaka, Sam Nishimura, and Lucy Robello. Their personal stories add detail to the cultural and historical background of the area and they compliment the information provided by living *kūpuna* and *kama‘āina* who were recently interviewed by CSH (detailed in Section 8). Their memories help us understand commercial and tourist activities in proximity to the Project area decades ago.

6.1 Manabu Nonaka

About 200 feet (south) of Kewalo Lane (the border of the project footprint) is the location where Manabu Nonaka’s family businesses operated in the 1930. Manabu Nonaka (MN) was born in Honolulu on June 4, 1915. His father was a taxi driver in Wailua 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. His family also ran a trucking business from the shop’s location. 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:

MN Well, we had one of the few stores in Haleiwa…

HM What did you guys sell at the store?

MN Well, we sell general merchandise. You name it, we got it. We had candy, dry goods, hardware. We had everything.

HN Where was that located?

MN Right in the heart of Haleiwa. It’s close to…M. Yoshida store, now, which is still standing [at the time of the interview in 1976]. Tht is 66-150 Kam Highway.

HN So, actually, you guys lived there for real long time? When did you guys move there, across the streed?

MN Yeah, we had to move there, because the party that lease the place to us said he was going to make subdivision in there, so we had to move out from there. That was about 15, twenty years back.

HN What do you mean, 15, twenty years back?

MN 1939. Somewhere around there.

HN Then you guys moved across the street? Is that it?

MN The last remember we moved to here.

HN And what about the place where you have your trucking next to Sato Barbershop? What about that place?

MN No, our truckers operated from the place that we had the store, because I used to put my truck inside that garage, remember? And that truck, all of us went in the back of that place. So, I think, we lived there thirty to forty years. My lifetime.

HN Can you describe that place a little bit?

MN Well, that place was right on Kam Highway. In those days, our store was pretty big. And later on, when I went inot trucking business, we made that as a garage. That place was kind of big compared to the other places that the other people had. (UH 1977:433)

Currently, there is a Long's Drugs at the address where his family's businesses once stood.

Mr. Nonaka also talked about growing up during the hay day of the Haleiwa Hotel.

MN …I remember those days that Haleiwa used to be a tourist town, because they had the Haleiwa Hotel, and we used to ask the tourist to drop a nickel. That means to throw money in the water, and we used to dive for 'em. They used to throw five cents, ten cents, 25¢. Sometime, half a dollar, but very rarely dollar. And we used to pick up pretty good. Those days money was something. You pick up twenty, 25¢; that's a hell of a lot of money compared to today.

HN What you used to do with the money?

MN Of course, that money was our money, so we spent it whatever we wanted to.

HN And what you guys used to do with it?

MN Well, they had a candy store. Actually, they had one, but things were so cheap. Actually, they had one, but things were so cheap. Anyway, money was worth so much before. You know, a can of sardine used to cost maybe four cents, which today I think you can buy for 25¢. And also, devil meat. We used top pick'em for two, three cents. Today, I guess you have to pay twenty cents for it.

HN That's the kind of stuff you used to buy with your 25¢? Buy candy, eh?

MN No, We used to buy candy, and also, sometime when we had a quite a bit of money, we used to go to the restaurant, order sandwich and take it up.

HN That used to be delicacy? Ordering sandwich?

MN Well, that's a real occasion.

HN Whose idea was to go dive for the money?

MN Well, no matter (where) you go, where you find tourist, you find kids asking for money. Naturally the tourist oblige.

HN So you guys was swimming in the water?

MN 'As right. You got to dive for the money.

HN Yeah. That's in Anahulu Stream?

MN That's right. They used to have a bridge going across Haleiwa Hotel. Tourist used to come by the train, and they have to go across the beach to get to the Haleiwa Hotel. So then, we stay in the water. We tell 'em, "Drop a nickel." And you know the deep place was about ten, 15 feet. Sometime we can't go down to get the money. But the older boys was good enough. They go way down to get the money. And, you know, the good divers, they make quite a bit of money, too. Some people used to make two dollars, three dollars.

And in those day, 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... (UH 1977:431)

MN …Haleiwa Hotel was a big outfit, then. Haleiwa used to be one of the biggest tourist town. Because they used to come from train, eh. From town. And those days, like I said, then, did not have too much cars. So transportation was mostly from train.

HN Can you remember how big the hotel was?

MN Oh, it was big hotel. In those days, let's say 1920, it was comparable to Royal Hawaiian, because Haleiwa used to be a tourist town.

HN Anything else about the hotel? You remember how it used to look?

MN Well, not exactly because we were not allowed to go in. Only we could see from far, but you could tell that it was a tourist place, because only the rich people could go in there and eat there. (UH 1977:432)

6.2 Sam Nishimura

Mr. Sam Nishimura (SN) was interviewed by Perry Hakayama (PN) on July 22, 1976 in Haleiwa. In 1899 Mr. Nishimura's father came from Japan to work as a contract laborer in Puunene. In about 1904, he moved to Haleiwa and started truck farming and soon married his wife, Mr. Nishimura's mother. He was born in Haleiwa. Mr. Nishimura also spoke about the Haleiwa Hotel and tourism.

PN Could you go into little about the growth of Haleiwa? How di dit grow over the years?

SN Well, at first, Waialua-Haleiwa was in the North Shore, so naturally to come from Honolulu, they had to come either on the buggies or automobile. Not too many automobile at that time. Or by train. All the honeymooners used to come on the train and stop at the Haleiwa Hotel. (UH 1977:413)

SN They stay about one week, swimming, golfing, horsebackriding in those days. Lots of tourists used to come to Haleiwa by train. Honeymooners Automobile started to come out; the taxi at that time cost $1.50 one way. So in other words three dollars round trip. Which was very expensive. But still, lot of them used to go in town. Like in our case, maybe once a year. That's all. We used to go in town You cannot afford to pay three dollars for the trip just to play. There were maybe about six of them running taxis at that time. And they were making pretty good money, I think. I don't know.

PN When was this? What years?

SN About the '20s. And then, gradually, the people didn't ride on the trains too much to go to town. So they didn't get the business, and train business was getting slow. That, I do not know, but anyway, probably that was th reason why the Dillingham started to fade out in the train business. Then, down here used to be quiet and good place to take a rest, so , people used to come to Haleiwa and just take it easy. It started to grow when plantation started to expand all of the fields. They took lot of these fileds. Then they needed more peopl down here. So people started to come to Haleiwa and Waialua. (UH 1977:414)

6.3 Lucy Robello

Ms. Lucy Robello (LR) was interviewed by Chad Taniguich (CT) on July 20, 1976 in Waialua. Her parents immigrated from San Miguel, Portugal as children. Their parents came "Because they were dong very poorly over there and they heard of the new Sandwich Islands, the new country, and all that, and wanted to better themselves, and they did. They came on their own. But they were then, they came as immigrants. The plantations here paid for them to come over. And when they start working over here, they paid back the trip to the plantation" (UH 1977b:213). Evenutally, after he was married, Ms. Robello's father drove a stagecoach from Pearl City to Kahuku to deliver the mail and carry wealthy passengers (UH 1977b:214). Ms. Robello talked about the Haleiwa Hotel.

LR I remember the Haleiwa Hotel. Was very nice. Something really nice to see. And that's where like the royal people used to come and spend their time over there. They used to have some great dances and things over there. Really nice times. That was for the higher class people. Not like us. We never went. We only saw it from the outside (Laughs) Never inside, you know.

CT You remember any particular people who went there?

LR Queen Emma used to come. And at the same time, she used to go to that church then: Liliuokalani Church over there.

CT Was it more Hawaiian people who went?

LR The royal ones and then the richer *haoles* like the Bishop, what do you call…Castle and Cooke, the big Bishop Estate owner…

CT Not Charles Bishop?

LR Yeah, he was married to Bernice. SO they did those trips over here. That was for the high class people. (UH 1977b215)

Ms. Robello aslo talked of the commercial side of Haleiwa at that time.

LR …[The Chinese] had little stores. One was a butcher that I know. The other one had another. Was two little butchers. One in Haleiwa and one right down her eby Tanabe's Road, over there ahad anotehr little butcher. (UH 1977b:223)…Then we had that Achiu store right here. That was a grocery store. But he ahd a meat market there. The old Achiu. And then, afterwards, came Leong Hop. That was another Chinese. He started that store out in Otake Camp. Then we got little Shimamoto Store. The Japanese—the little Shimamoto Store. And Fujioka took over the plantation store when the plantation gave up. (UH 1977b:224)

Section 7 Community Consultation

7.1 Community Consultation Table

Table 4. Summary of Community Consultation Efforts

Name	Affiliation	Notes
Abrigo, Marlene	*Kama‘āina*	CSH sent letter by email 11/22/10 CSH sent letter by email 1/21/11
Asato, Joel	Haleiwa local	Interviewed on 1/11/11 with Mr. Henry Preece
Awai-Lennox, Gladys	*Kama‘āina*	CSH sent letter by mail 11/22/10 Interviewed on telephone 1/17/2011 CSH emailed interview summary for approval 1/24/11 CSH received approval and consent form 2/6/2011
Jan Becket	Kamehameha Schools teacher familiar cultural and historic sites on North Shore.	CSH sent letter by email 11/22/10 Mr. Jecket replied on 11/29/10 via email saying he does not have anything to offer the Project
Canon, Diane	*Kama‘āina*	CSH sent letter by mail 11/22/10 CSH resent letter by mail 1/21/11
Causey, Emmaline	*Kama‘āina*	CSH sent letter by mail 11/22/10 Interviewed in Haleiwa and signed authorization on 12/8/10 Mrs. Causey confirmed interview 2/6/11
Evans, Malia		Suggested by OHA but no contact info provided
Cayan, Phyllis “Coochie”	SHPD Cultural Specialist	CSH sent letter by email 11/22/10 Ms. Cayan responded in a letter dated 12/ 13/ 10
Harvest, Dino	ohana are from Hale‘iwa.	CSH sent letter by mail 11/22/10 CSH resent letter by mail 1/21/11

Name	Affiliation	Notes
Helemano, Butch	Caretaker of Pu'u o Mahuka heiau	CSH sent letter by email 11/22/10 Email returned 11/22/10 CSH resent letter by email 11/29/10 CSH resent letter by mail 1/21/11
Jenkins, Betty	Waimea Valley Center - Kupuna	CSH sent letter by email 11/22/10 CSH resent letter by email 1/21/11
Lenchanko, Thomas	*Kama‘āina*	CSH sent letter by mail 11/22/10 Interview scheduled for 2/5/11 but he cancelled.
McKeague, Mark Kawika	Oahu Island Burial Council	CSH sent letter by email 11/22/10 Mr. McKeague emailed reply on 11/23/10 explaining a CIA he completed for the Kawailoa Transfer Station, and suggesting CSH refer to the KS North Shore Plan. He also copied Leimaile Quitevis, OIBC Waialua moku representative, on the email.
Nāmu‘o, Clyde	Administrator, Office of Hawaiian Affairs	CSH sent letter by mail 11/22/10 responded with a letter dated 12/13/10
Nihipali, Kunani	Cultural lineal descendent	CSH sent letter by email 11/22/10 CSH resent letter by email 1/21/11
Preece, Henry	Surfing legend, Haleiwa local	CSH left phone message 12/21/10 Interviewed 1/11/11
Pua-Nichols, Cynthia	Wai‘alua Hawaiian Civic Club	CSH sent letter by mail 11/22/10 CSH resent letter by mail 1/21/11
Quiteves, Leimale	OIBC Waialua Rep	CSH sent letter by mail 1/21/11 CSH resent letter by email 1/24/11
Sensano, Paul	Haleiwa Harbor, Harbor Agent:	Referred by OHA CSH sent letter by email 1/21/11

Name	Affiliation	Notes
Shirai, Thomas	OHA-Native Hawaiian Historic Preservation Council, Past Member OIBC, Lineal Descendant, Cultural and Historical Traditions of Waialua	CSH sent letter by email 11/22/10 CSH resent letter by mail 1/21/11
Silva, Janell Chun	Haleiwa *Kama‘āina*	CSH sent letter by mail 11/22/10 CSH resent letter by mail 1/21/11
Topolinski, John R. Kaha`i	*Kama‘āina*	CSH sent letter by email 11/22/10 CSH resent letter by email 1/21/11

7.2 Written Responses

7.2.1 Office of Hawaiian Affairs (OHA) Response Letter

In a letter dated December 13, 2010 OHA advocates for a comprehensive community outreach.

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

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

HRD10/5393B

December 13, 2010

Heather McMillen, Researcher
Cultural Surveys Hawai'i, Inc.
P.O. Box 1114
Kailua, Hawai'i 96734

Re: **Pre- Cultural Impact Assessment Consultation**
Kamehameha Schools Hale'iwa Commercial Redevelopment Project
Hale'iwa, Waialua District, Island of O'ahu

Aloha e Heather McMillen,

The Office of Hawaiian Affairs is in receipt of your November 22, 2010 request for comments ahead of a cultural impact assessment (CIA) for the proposed redevelopment of commercial properties owned by the Kamehameha Schools in Hale'iwa.

Infrastructure installation, landscaping improvements and construction of a pedestrian walkway may require the use of the public right of way along Kamehameha Highway. The demolition of certain buildings and the construction of new storefronts and the preservation or renovation of certain historic buildings to be used for commercial purposes is proposed. At final build-out, the project will increase the gross leasable area within the 4.22 acre redevelopment area from 14,000 square feet to 30,000 square feet.

Many of the essential historical and cultural elements which provide Hale'iwa Town with a "sense of place" have been incorporated into the North Shore Sustainable Community Development Plan. OHA advocates that a comprehensive community outreach effort be conducted and that any thoughts or concerns shared with you are afforded appropriate consideration during preparation of the CIA.

OHA recommends consultation with the following individuals who may be willing to share their thoughts with you: Malia Evans, Thomas Shirai, Kalani Fronda, Paul Sensano and Leimaile Quitevis. The North Shore Neighborhood Board may also be an appropriate forum to seek input on the CIA.

Heather McMillen, Researcher
Cultural Surveys Hawai'i, Inc.
December 13, 2010
Page 2 of 2

Thank you for initiating consultation at this early stage and we look forward to reviewing to reviewing the CIA and providing additional comments at that time. Should you have any questions, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

Figure 12. OHA Response Letter, December 13, 2010

7.2.2 SHPD Response Letter

In a letter dated December 13, 2010, SHPD suggests a wide community outreach and expresses concern for the continued access to the cultural places in the wider *ahupua'a* for the public.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

GUY KAULUKUKUI
DEPUTY DIRECTOR

LENORE N. OHYE
ACTING DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 13, 2010

LOG NO: 2010.3548
DOC. NO: 1012PC001

TO: Heather McMillen and Mary-Lindsey Correa, CHS Cultural Researchers
Cultural Surveys Hawai'i, Inc. P.O. Box 1114, Kailua, Hawai'i 96734

FROM: Phyllis Coochie Cayan, SHPD History and Culture Branch Chief

Subject: PAALAA2: A Cultural Impact Assessment (CIA) for the redevelopment of some of Kamehameha Schools' commercial properties located in Hale'iwa. Pa'ala'a Ahupua'a, Waialua District, O'ahu Island.
TMK: [1] 6-6-004:013, 14,15,16, 17, 18, 19, 27, 28, and 32.

Mahalo for the opportunity to comment on a CIA for the redevelopment of some of Kamehameha Schools' commercial properties located in Hale'iwa, O'ahu.

As you all are aware, the general public has been vocal in what it thinks is appropriate use of public and private lands in Hale'iwa. That said, the SHPD supports your widest outreach in the community for comments as well as outreach to the core families of Hale'iwa (those 'ohana with three or more generations of living there and/or connections to the area). SHPD is also concerned with traditional cultural access to the cultural places and/or resources (both mauka and makai) in the general ahupua'a should also be considered as related to the proposed project area.

SHPD offers some referrals to some folks you may want to talk story with regarding Kamehameha Schools' plans in Hale'iwa:

- Thomas Shirai, kama'aina — kawaihapai@hawaii.rr.com
- Neighborhood Board for Hale'iwa-Waialua
- Ms. Leimaile Quiteves, OIBC Waialua Rep. — leimaile.q@gmail.com

You all may want to contact those groups recently publicized against development, to talk story with fisher folk at the harbor, to get referrals to other long-time families and/or na kupuna groups in the area for their mana'o and to survey the businesses in Hale'iwa and Waialua.

Any questions, please call me at 808-692-8015 or via email at Phyllis.L.Cayan@hawaii.gov

Figure 13. SHPD Letter, December 13, 2010

Section 8 Interviews

8.1 Overview

Kama‘āina and *kūpuna* with knowledge of the proposed Project and study area participated in semi-structured interviews for this CIA. Interviews for this study were conducted from December 2010 through January 2011. CSH attempted to contact 22 individuals for this CIA (see Table 4); nine individuals responded and four of these *kūpuna* and/or *kama‘āina* participated in interviews for more in-depth contributions to the CIA. At the present time, all interviews have been reviewed and approved by the participants for inclusion in this CIA; CSH initiated the interviews with questions from the following five broad categories: Resource Gathering and Hunting, Ritual and Ceremonial Practices, Freshwater and Marine Resources, Burials, Trails, and Cultural and Historic Properties. Brief backgrounds of participants' thoughts, memories, comments, and concerns about the proposed Project area are presented below.

8.2 Acknowledgements

The authors and researchers of this report extend our deep appreciation to everyone who took time to speak and share their *mana‘o* (thoughts, ideas, beliefs, opinions, theories) with CSH whether in interviews or brief consultations. We request that if these interviews are used in future documents, the words of contributors are reproduced accurately and not in any way altered, and that if large excerpts from interviews are used, report preparers obtain the express written consent of the interviewee/s.

8.3 Gladys Awai-Lennox

Mrs. Gladys Awai-Lennox was interviewed on January 17, 2011 on the telephone. She was previously interviewed by CSH in 2010 for a project on Kawailoa and the interview summary that follows incorporates information from both interviews when she shared her recollections of the Hale'iwa area during the 1930s and 1940s.

In 1929, Mrs. Gladys Awai-Lennox was the second of four children born to George Elama Ka'ele'makule Awai and Beatrice Chung-Hoon Awai in Honolulu. Her mother was from the Liliha area at School Street. Her father was a 1910 graduate of Kamehameha Schools and passed away in 1981 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 kuleana land in Hale'iwa where she now resides full-time.

8.3.1 Family Kuleana in Hale'iwa

You can find their family *kuleana* (small piece of property, as within an ahupua‘a) by following Hale'iwa road, past Ali‘i Beach park, past the Japanese temple and school, near where Kamehameha School has their preschool, you can see a green house with a big front lawn, and that is their family house. It has ten bedrooms and was rebuilt in 1930. Mrs. Awai-Lennox lives near the taro in the agricultural lot behind the house and her cousin, Amy Kalili Asano, still lives in the big family home. The land was granted to her father's grandfather at the time of the Great

Mahele and her family has been in the area ever since. Their *kuleana* is in TMK 66-0807 and her father also acquired some land in TMK 660519 at a later date.

Her father told her stories of their ancestors helping the early missionaries travel (circa 1830) because, "in those days, they knew about the currents, so they could get them to and from North Shore to Kauai‘i." Since her father worked in Honolulu, their family's time was divided between town and Hale'iwa, yet her father ensured they religiously went back on weekends to return to the *aina* and tend their taro.

She explains that they had their taro lands, breadfruit, and bananas, which still exist to some extent but their supplies have diminished. She points out that although they still have many coconuts, little taro is available. Tending and eating taro was central to their life. "We never bought *poi* for over fifty years!" she reminisces. They always harvested their own taro and prepared *pa'i'ai* (hard, pounded but undiluted taro). They would line the bowl with a *tī* leaf and, as needed, mix it with water to make *poi*, which was their staple. When her family needed a large quantity for a *pā‘ina (*party with dinner), her father would take their taro to Mr. Matson's mill behind Kawaiha‘o church in Honolulu to prepare the *poi*.

8.3.2 Childhood Influences

Important influences during her development included her family, the Congregational church they attended, education, Hawaiian language and culture, living off the land, and living off the ocean. Her mother was a teacher at Kawailoa elementary school and her uncle, James Awai, was a principal there, too. Her father worked for the Land Office and he was bilingual, fluent in his native Hawaiian and in English. One of his strengths was translating documents such as deeds, which were all in Hawaiian. Mrs. Awai-Lennox still possesses some historical documents from her father that were signed by Charles Bishop, husband of Bernice Pauahi Bishop. Although she did not grow up speaking Hawaiian, her father was fluent and he created Hawaiian lessons for Mrs. Awai-Lennox and her siblings. They began with single words, then phrases, and then sentences. Music was another very important way they learned Hawaiian. Her father played music at the Hale'iwa Hotel with his brother and sister and they also were involved in music through their church. Memorizing Bible verses in Hawaiian also contributed to Mrs. Awai-Lennox's Hawaiian language development. "When I think back now, he was wanting us to retain our culture, not lose it. Mother was very supportive, too, you know, typical school teacher." Mrs. Awai-Lennox reflects that this was important for developing their self-esteem.

8.3.3 Project area and vicinity then and now

Mrs. Awai-Lennox is intimately knowledgeable about the Project area and has spent her much of life in the area surrounding it. Her home is a ten-minute walk through in the grasslands to Matsumoto's Shave Ice. She describes the Project area and vicinity as consisting of wetlands and grasslands explains that although it is still classified as wetlands, it has changed and what was cultivated in past is not cultivated there anymore as it has become overgrown with grass. Still, she says, "If you look hard enough, you'll still see some Hawaiian plants: *honohono* grass, *pōpolo*—which was occasionally used medicinally. There's a creeping water violet and a clover, a large clover leaf, that is found only around wetlands."

Mrs. Awai-Lennox explains how the landscape and land use in the area has changed since she was young. As a child they had taro and rice growing on their property and in the area between their property and the Project area. “We had leased to an old Chinese family to do rice and they used water buffalo [to plow],” she recalls. To ward off the birds from eating the rice, the Chinese farmers also strung cords with old cans to rattle and scare the birds away. When she was growing up, Mrs. Awai-Lennox and her siblings followed the paths in-between these rice paddies to get from their home to the Haleiwa Theater (currently McDonalds).

Beyond rice, other plants were introduced and became common. For example, she names the lotus, or *hasu* (Japanese), which she describes as having white or pale pink blossoms that are sometimes used in dried floral arrangements, but she points out that the lotus is primarily grown for its edible root. She says it grows voraciously. “I can see why the Egyptians revered it!”

Mrs. Awai-Lennox also explains how the wetlands were fed by *auwai* and had cultural and historic significance as a place where *ali’i* were known to have bathed in the fresh water fed by area springs. Speaking of the larger environs surrounding the Project footprint she says, “We are certain the *ali‘i* enjoyed the balmy weather and abundance of food [in the area],” explaining that Queen Lili‘uokalani had a home near Anahulu stream. In fact, as children, she and her siblings swam in Ananhulu Stream. “Back then, the water was clean and the men would throw us pineapples from the [O.R.&L.] train and we loved that! I know the waters were clean because the military who were stationed in Kawailoa would throw coins in the stream and we could see them all the way at the bottom and, we’d go dive for them!”

Finally, the area was also used for recreation. Mrs. Awai-Lennox remembers her father talking about a race track, somewhere near their home in the wetlands and grasslands area. She estimates it may have been during Lili‘uokalani’s time in Hale‘iwa. Hunting (for birds and pigs) and fishing were other recreational activities that were popular in the area at that time.

8.3.4 Natural and Cultural Resource Use

“Even though we weren’t considered poor, we lived off the uplands and oceans. This was before [talk about] sustainability,” she remarks. Although her family primarily fished in the ocean, she also knows about freshwater resources in the area.

8.3.4.1.1 Freshwater resource gathering

“This area [including the Project area] has vegetation and animal life of its own that’s unique to the wetlands. At one time when the waters were clean there were *‘o‘opu* and freshwater shrimp—*‘ōpae*, lots of crayfish like they have in Florida, and now there are lots of dark tilapia, the inedible ones,” she recalls. “I loved the ‘ōpae that Aunty Matlida prepared. She would clean it, then *pa‘akai* (salt), and *lomi* (rub with fingers) it around. If there was an abundance of it she’d cook and dry it,” she explains. Otherwise they ate it raw. She also recalls, “two types of clams: one like a half moon, the other conical.” Unfortunately, Mrs. Awai-Lennox says these delicacies are hardly available at all now and those that are left are not safe to eat due to pollution.

8.3.4.1.2 Terrestrial Plant Cultivation and Gathering

In addition to growing *taro* and other vegetables on their property, her family also cultivated breadfruit, banana, and coconut trees. For special holidays such as New Year’s and birthdays it was her family’s tradition to prepare *kūlolo* (coconut pudding made of baked or steamed grated

taro and coconut cream), *haupia* (pudding made of arrowroot, or *pia*, and coconut cream). Mrs. Awai-Lennox and her siblings also utilized the uplands for fruit. She recalls gathering guava and passion fruit which they used to make juice. Some would be stored in freezers for later use.

Another plant they collected was the *kiawe.* Mrs. Awai-Lennox and her siblings collected the seed pods or beans as one of their chores. *Kiawe* was used for fodder for the cattle and pigs kept by her father’s youngest sister who lived above Waiamea Bay. Other plants her family valued for their aesthetic qualities including gingers (especially white but also red and yellow) and *hala* (pandanus). Their *hala* tree, which sadly died later, was particularly loved by Mrs. Awai-Lennox as she recounts how her father would make *hala* leis on special occasions for family members. The red *hala* lei [made from the pandanus fruit parts or phalanges] was very special, she recalls. She recently spoke with a *kapuna* from Kahuku, Roy Benham, who is in his late 80s, and he told her of the saying “you never leave Kahuku without a *hala* lei.” The sentiment rings true for her and she adds, “same for us. We would make a red *hala* and it was very special.” For celebrations they gathered other special flowers such as the *kukuna-o-ka-lā* for lei. This literally means ray of the sun and refers to the stiff yellow to red calyxes, or outer parts of the flower, resemble the sun’s rays and grow on mangroves (Pukui and Elbert1986:178).

8.3.4.1.3 Birds

Mrs. Awai-Lennox relays multiple examples of how birds have been and continue to be important in the area. Perhaps most relevant is the *‘alae ‘ula* (Common Hawaiian Moorhen), an endemic water bird. It was present when she was growing up and, she still sees them daily in the wetlands near their home in direct proximity to the Project area. When it flew close to their family home and cried, they believed it meant that someone would pass away. Her cousin who is about 90 years old also remembers that. Her younger son who was a dedicated practitioner of *lua* (Hawaiian martial arts) did research on their genealogy, and learned that Ke‘u, a family name, is an onomonopia for the call of the *‘alae ‘ula* call. Their family feels connected to the bird. “We still have them here in the area,” she added. Another native water bird she sees regularly in the area is the Hawaiian stilt. Mrs. Awai-Lennox also mentions the stories her father told about retrieving plover for Prince Kūhio, who was fond of hunting them, and about the lights on Mount Ka‘ala at night, which were from people hunting for wild turkeys. Peacocks and wild turkeys are abundant there, she explains.

8.3.5 Burials

Mrs. Awai-Lennox does not know of any burials in the area, aside from the graveyard at Liliuokalani church.

8.3.6 Recommendation

Mrs. Awai-Lennox supports the Project and Kamehameha Schools’ efforts in the area generally. Her father was a 1910 graduate and he had a lot of aloha for Kamehameha Schools. She carries that sentiment as well.

8.4 Emmaline Causey

CSH interviewed Mrs. Emmaline Causey on December 8, 2010 around Hale‘iwa town as she pointed out important places from her past. Previously in 2010, CSH interviewed her at home at Diamond C. Ranch, LLC in Hale‘iwa for a project on Kawailoa and the interview summary that follows incorporates information from both interviews.

Mrs. Causey was born in 1943 in Hale‘iwa to Juliet (maiden name Souza) and Henry K. Plemer. Both of her parents came from large families who have lived in Hale‘iwa for a long time and are well known as her family has been in Hale‘iwa for generations. Her maternal grandfather, Mr. Souza, came from Madero, Portugal to Hale‘iwa . He used to lease land where Jameson’s By the Sea Restaurant now stands in Hale‘iwa town up to Kawailoa Road nearby where she now lives. Mr. Souza was a chauffeur for the manager of Waialua Sugar. He was also a horse jockey. Mrs. Causey’s maternal grandmother, Ms. Edith Achiu, was Hawaiian-Chinese 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 Lokoea 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.

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 *āholehole*, something that is no longer possible as the marsh is now managed by the Department of Land and Natural Resources 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 *mauka* of 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.

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 andher other neighbors got to ride the rail on its last trip. (See

Figure 20 for a historic photograph from that time.)

8.4.2 Important sites around Hale‘iwa

On December 8, 2010 Mrs. Causey toured CSH around Hale‘iwa town and pointed out important places from her past. These include Jerry’s Sweet Shop, which is no longer standing but used to be next to present day Jameson’s By the Sea Restaurant. She recalls how they used to sell five burgers for one dollar. Next to Jerry’s Sweet Shop, her uncle used to have an appliance shop (but it is no longer standing), and across Kamehameha Road on the Waimea side of Jameson’s By the Sea Restaurant, she pointed out the location of the old “Long House” (no longer standing), which used to be rented out for parties and food was provided by Sea View Inn (currently Jameson’s By the Sea Restaurant).

On Kamehameha Road, she pointed out the location of the “original shave ice” place, which was *not* Matsumoto’s she emphasizes. On the same road, Mrs. Causey pointed out Mrs. Aoki’s sewing school, which is now a candle shop next to Aoki’s Shave Ice (Figure 14).

In 1959 when she was a high school student, Mrs. Causey took sewing lessons there. Later in the 1980s, Mrs. Causey worked at Aoki’s Shave Ice. Mrs. Causey and her family used to buy crack seed from Matsumoto’s and she recalls eating it after church services at Lili‘uokolani Church, which is another important site she identified (Figure 15). She describes how Queen Lili‘uokalani was given a clock in 1892 at the Queens’ Jubilee in England, which she gifted to the church in Hale‘iwa. She pointed out where an old filling station used to be located in the parking lot adjacent to Matsumoto’s (Figure 16), the current Project site. The Yoshida buildings (Figure 17), currently occupied by Haleiwa Eats and Global Creations Interiors, used to be a dry goods store and the family lived in the back of the store, Mrs. Causey recalls. She also pointed out the court house (Figure 18) where her great grand-father was a judge and explained that the jail used to be located in the basement. The present day post office is the site of the old Haleiwa garage that was owned by the Takenaka family. As a youngster, she recalls buying candy and fountain drinks from Yamada Restaurant (no longer standing) and, although her family did not go to the cinema often, she also pointed out where both Kuga Theater and Haleiwa Theater once showed films.

Figure 14. Kamehameha Road, Candleshop (previously Aoki's Sewing School), CSH December 8, 2010

Figure 15. Queen Lili‘uokalani Church on Kamehameha Road directly across from Project area, CSH December 8, 2010

Figure 16. Parking lot in Project area, previously a filling station, CSH December 8, 2010

Figure 17. Yoshida buildings, CSH December 8, 2010

Figure 18. Waialua Court House, CSH December 8, 2010

8.4.3 Waialua Sugar Plantation Camp

About a ten minute walk from where she now lives was the Kawailoa 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 Wialua 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, Mrs. Causey rode go-carts there. She also recalls that people gathered seaweed there, at what is known as Police Beach. Mrs. Causey notes how, these days people do not cut seaweed as they should; they uproot and destroy it completely so it cannot continue to grow.

8.4.5 Conclusions

Mrs. Causey does not think there are any burials in the area. She has no objections to the Project.

Figure 19. Old airfield at Puaena Point where Mrs. Causey rode go-carts as a child, CSH December 8, 2010

Figure 20. Historic photograph of Waialua Sugar plantation treating its workers to a farewell train ride when it converted from railroad to tracks to haul sugar cane (Hawai‘i State Archives)

8.5 Joel Asato and Henry Preece

CSH interviewed Mr. Joel Asato and Mr. Henry Preece, well-known as Uncle Henry, in Haleiwa Town on January 11, 2011. Mr. Asato was born in Kukea near Puiki in Waialua in 1945. He grew up in Waialua and attended Waialua High. His mother was Marion (Murayama) Asato and his father Shigeo Asato. His father was a retired clerk for the City and County of Honolulu in Haleiwa and his mother was a clerk and Haleiwa Supermarket.

Uncle Henry Preece was born in the Waikele, Waipahu area in 1929. His father was John Quintin Preece and his mother was Alvina Ha‘ea Kapepa. Mrs. Kapepa worked many different types of jobs to support her family but her passion was music. She was the lead singer for the choir at Kawaiha‘o Church and her father was the choir director. Uncle Henry moved out to Haleiwa in 1953 when he was 24 years old. He was living at Ali‘i beach, where the Harbor is now. He was living off the land catching fish, gathering *limu* and surfing. Only the locals knew about this spot because it was covered by *hau* trees. Uncle Henry lived there for 3½ years before he met his second and current wife, Puanani, at a Christmas party. Puanani Preece was born and raised in Haleiwa. They have lived in Haleiwa their entire married life.

8.5.1 Growing Up in Waialua

Mr. Asato recalls growing up in Waialua was simple and country. Everybody knew each other. In the summertime everyone worked in the fields picking pineapple. He remembers riding his bike down to the baseball field and stopping at the river to check out the fish. “Back then, the river was so clean and abundant with fish. The rivers were full of mullet, and there would be people gathering *limu ‘ele‘ele*.”

Mr. Asato fondly remembers Jerry’s Restaurant where you could get five hamburgers for $1. He would often go there with his family for dinner or with his friends after school. The restaurant was also open 24-hours so it was the place to hang out for the high school kids. There were three theatres in the area. Both Uncle Henry and Mr. Asato remember when the theatre was only $0.15. Now there are no theatre houses in Hale‘iwa. Not very many of the people had television either. Everyone would gather at one person’s house to watch TV, usually one of the young kids would have to go on the roof and fix the antenna, even with that there was still a fuzzy picture, not like the clear ones we get today.

Mr. Asato is one of the few of his friends that still live in Waialua. Now most of his friends and family have moved out of Waialua to areas like Mililani and other places.

8.5.2 The Anahulu River and Waialua Bay

Uncle Henry and Mr. Asato remember the boats in the harbor being tied up to the *hau* trees. The Anahulu River would come straight into the bay. The river was clean and full of fish, especially mullet and *‘ōpae*. During certain seasons fish would run in that area, the *halalū* and akule would come in and people would be all along the coast. They still come in today but not the way they used to. Another fish that would run along this coast was the *‘āweoweo*. Uncle Henry remembers them coming in by the thousands, where the ocean would turn red because there was so much fish. Since the construction of the harbor the fish don’t seem to be as plentiful and don’t come in shore the same way that they did then. The sand has also changed. The shore

line had more sand that it does today. Today, the coast line is rocky in spots that were full of sand. Even though sand is often brought in from other areas, it doesn’t help. The coast line doesn’t look the same anymore. There was also a lot of *limu* in this area, particularly *‘ele‘ele* and *manauea*. People would come down to Ali’i Beach to gather *manauea* for family parties because it was so plentiful.

The Anahulu River was used as an unspoken boundary during the old days to separate the local residents from new comers. Mr. Asato and Uncle Henry remember when Waialua was majority local family from the plantations. But soon there were large influxes of residents from the mainland. The majority of the people came for surfing and usually with the shirt on their backs. Although they mainly stayed near Sunset area, they would come to Haleiwa town because the there were bars, shops and restaurants. At that time Sunset was the popular place to be in the surfing world. However, the custom at the time was that *haoles* (foreigners, whites) could not pass the Anahulu Bridge.

8.5.3 Kaiaka Beach Park

When Mr. Asato was young, Kaiaka Beach Park was owned by Palama Settlement. The cabins and camping sites there were managed by his grandparents. Today it is used as a camping site under the City and County of Honolulu. He remembers Roosevelt High School coming down to run their summer camps. There was also a fishing village near the ocean. He remembers fisherman standing on the *pōhaku*, called Pohaku o Lanai. To his knowledge the fisherman would stand on the rock to watch for fish and strike the rock when fish were sighted to let fisherman know that the schools were running.

The recalls that there was a tidal wave in 1957 or 1960 that damaged the cabins and they were never rebuilt. The small farms in that area were also destroyed. Mr. Astao remembers Ige Farms and Asato Farms. The railroad would come right through that area.

8.5.4 He‘enalu (Surfing) Traditions

Waialua is famous for its ocean and surf. Uncle Henry is a part of the ocean traditions in Hawai‘i and is well known thought out the islands and around the world. He started to surf at about 15 or 16 years old and grew up surfing on the south and west side of the island. He began surfing in Waialua and the north shore after he moved to Hale‘iwa in 1953. One of the things that he values the most about surfing in Waialua is the number of breaks that are there and are good. “Some beaches have really good waves but only have one or two surf breaks, but that is what’s good about this coast, there are lots of breaks so it doesn’t have to get competitive or crowded.” He has surfed just about every surf break on this side of the island including, Laniakea, Puena, Pipeline, Ali‘i Beach, Alligators and Chun’s Reef among others. When he first began surfing in this area, no one would surf the outside breaks which would often get to 10-15 feet. The locals would stay to the inside because the outside breaks could get pretty rough under certain conditions. The surf was also blocked by *hau* trees, so if you were not from Hale‘iwa area you would not know the surf breaks were there. Uncle Henry was the first surfer of that time to start surfing the outside breaks, soon after the other locals began to join him and the word soon spread. As a result, surfers from Waikiki and other parts of the island started coming to Waialua. It was not until the State of Hawai‘i cleared that area for the current Boat harbor in the 1960’s that more people began to come.

One of Uncle Henry’s famous surfing *mo`olelo* is his account of surfing at what he and his friends call Avalanche. This surf break is unique because you need certain swell conditions for the waves to break. On this particular day the waves were between 20-25+ feet (40-50+ foot faces). The pioneering surf film maker Bud Browne was in Hawai‘i during that time and asked Uncle Henry if he and two other surfers would go out and surf Avalanche and he would film them. Uncle Henry said that they were very hesitant because the extreme conditions. He said that the waves outside of Ali’i Beach were different than other places because they formed walls rather than peaks, like Waimea for instance. These conditions made it even more dangerous, but they decided to try it anyway. When they got out there, they started to paddle for a wave. Uncle Henry realized that he wouldn’t be able to make the wave and tried to bail out but couldn’t. He went down the face of the wave and then got crushed by the waters. The three men got separated and didn’t know the fate of the other. It took Uncle Henry two hours to swim in, past the second reef then the first reef. Fortunately all three men lived to tell the story, but the cameras did not. When they arrived on shore Dan Browne and the crew had to tell them that the cameras couldn’t pick up anything because they were so far from shore.

8.5.5 Recommendations:

Mr. Asato knows that this area has specific zoning in regards to building type and style, which is “fishing commercial” and with in the guidelines of the Haleiwa Special District design controls. He is glad to hear that Kamehameah Schools plans to build while keeping rural scale and character of the area and asks that they also follow the sanctions of this special design district.

Both Mr. Sato and Uncle Henry recommend that rather than the conventional raised curbed sidewalks, the project consider non-elevated sidewalks without curbs be added for the safety of pedestrians while also accommodating local drivers. There are many tourists that come into Hale‘iwa town daily and because there are no sidewalks they often wonder into the streets causing near collisions and traffic. The interviewees remember that the issue of constructing conventional sidewalks has been proposed in previous years and has always been opposed by the community because it would cause inconveniences with easy access to shops and restaurants as well as street parking. They propose non-elevated side walks without curbs to remedy both the safety and access issues. They would also like to see some cross walks put in for safety reasons as well.

Queen Lili‘uokalani had a residence in Pa‘ala‘a near the Project area, on the Anahulu River. Mr. Asato remembers his *kūpuna* telling him about her visits to Pa‘ala‘a and the clock that is in the church there. He recently went down to that area to do a clean up and was hurt by the condition and state that this area was in. Mr. Asato recommends that the Kamehameha Schools plans regular maintenance of this area with community involvement.

Section 9 Cultural Landscape

9.1 Overview

The cultural landscape of the entire *moku* of Waialua has been modified acutely during the past two centuries, primarily because of the clearing and plowing of coastal land and sloping uplands between gulches for sugarcane cultivation with the Waialua Agricultural Company (Sahlins 1992:17). Still, archaeological sites documented in the early twentieth century (McAllister 1933; Thrum 1906), combined with collected *mo‘olelo*, indicate patterns of ancient habitation and subsistence as well as numerous *wahi pana*, for the coastal areas of the *ahupua‘a* of Kawailoa and Pa‘ala‘a. Today’s *kama‘āina* and *kūpuna* see the area as a place rich in Hawaiian history; a place that was known for taro cultivation and important natural and cultural sites; a place that had abundant freshwater and marine resources (that are now severely diminished); and a place that is valued for recreational activities. They are nostalgic about Hale‘iwa town and its character.

9.2 Wahi Pana and Mo‘olelo

The district of Waialua is rich in legends, stories, proverbs, and myths. According to one tradition, Waialua means “two waters” which refers to two large stream drainages (Anahulu and Helemano-Poamoho-Kaukonahua) that once irrigated extensive taro fields in the *ahupua‘a* of Kamananui, Pa‘ala‘a and Kawailoa, the more populous *ahupua‘a* on the eastern side of the district. Mary Kawena Puku‘i translated another meaning for the moku of Waialua:

> Waia, grandson of Wakea was said to be a cruel chief. He cared nothing of the gods or of doing good. He had men and women killed for the fun of killing them. When he saw a maiden with shapely legs, he ordered them cut off and if a man or a woman had beautiful tatooing [sic] he was put to death. Because of this he was driven away by the people. In the legend of Hiiaka, it was said that Waia lived and practiced evil deeds at Waialua, The people suffered so much there that the place was named for him Waia-lua (Doubly disgraceful). (Pukui synopsis of Hoku o Hawaii, March 12, 1928, cited in Sterling and Summers 1978:88)

The significance of the *moku* of Waialua in the consciousness of Native Hawaiians—and in particular, those old families native to O‘ahu—is suggested in the numerous traditions associated with Waialua. 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:

> 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 chiefly rank Lo is also associated with this moku, known as the chiefs of Lihue, Wahiawa and Halemano on Oahu, they were called Lo chiefs or *po‘e Lo Ali‘i* {“people from whom to obtain a chief”}.” (Kamakau, 1964:5) The Lo chiefs, were a line of chiefs worthy and sought out by other chiefly lines. They were known to live in the mountain areas and were admired for their strict adherence to the kapus associated with their rank.

> The men had kapus, and the women had kapus, and when they joined their kapus and children were born, the children preserved their kapus. The lived in the mountains (*i kuahiwi*); and if a kingdom was without a chief, there in the mountains could be found a high chief (*ali‘i nui*) for the kingdom. Or if a chief was without a wife, there one could be found one from chiefly ancestors. Kauakai‘ailani, Ma‘ilikukahi, Kalona, Piliwale, Kukaniloko, Pa‘akakanilea {Pa‘akanilea}, Ka‘akauualani, Ka‘au, Lale, Paoakalani, Pakapakakuaua, Nononui, Kokoloea, and a great many others were Lo chiefs. (Kamakau, 1964:5)

The Lo chiefs are also decendants “from Ulu and Nanaulu, sons of Ki‘i, twelfth in succession from Wakea and Papa, all high chief families count descent. . . the important Meweke family is , according to Kamakau, the first of that line form whom men today trace ancestry.”(Beckwith, 1970: 352) “The coming of Maweke and his sons to the Hawaiian group is dated sometime between the eleventh and twelfth centuries; Their descendents are supposed to have occupied the whole of Oahu and spread to the island of Kauai, Maui and Molokai, and hence some say, the differences in speech and custom between these islands and Hawaii.” Maweke had three sons who each inherited his lands on the island of Oahu. Mulieleali‘i received the lands on the south side, Keaunui settled the western end and Kalehenui the northern end. Mulielealii has three sons, Kumuhonua the eldest, Moikeha and Olopana. Kumuhonu establishes the line of ruling chiefs on Oahu until Haka, then the Moikeha line begins with Ma‘ilikukahi. (Beckwith, 1970: 352-353)

Ma‘ilikūkahi was the son of Pua‘a-a-Kahuoi and Nononui, he was born at the sacred site of Kūkaniloko, Waialua (Site 218; McAllister 1933:134–137), one of two famous birthing places in the Hawaiian archipelago (the other is in Kaua‘i) for the highest ranking chiefs, the *ali‘i kapu* (sacred chiefs) “an *ali‘i*, an *akua*, a *wela*—a chief, a god, a blaze of heat” (Kamakau 1991:38). Kūkaniloko is located near what some people consider the *piko* (navel or center) of O‘ahu (Becket and Singer 1999:64) It is considered a very sacred place; Ho‘olono-pahu was also a very sacred and consecrated place. “It was the waihau heiau where the navel cords of the chiefs were cut. There the ancient *pahu* drum Hāwea, which had been brought from the land of Kahiki, was sounded to announce the birth of a chief and the cutting of the navel cord.” (Kamakau, 1991: 136). After Ma‘ilikūkahi became mō‘ī, he was taken to Waikīkī to establish his court. Prior to that “the chiefs had lived in Wai‘alua and ‘Ewa”. (Kamakau, 1991: 54)

The Project site is in proximity to Kaiaka (“shadowed sea”) Point on Kaiaka Bay toward the western side of Waialua Bay. Kaiaka Point was the site for a large balancing rock, or *pōhaku*, called Pohaku o Lana‘i. The point near the northern coastal boundary of Pa‘ala‘a was called Kūpaoa (“strong, permeating fragrance”), which may have referenced jasmine, or night cestrum, which was used to scent kapa (Pukui and Elbert 1986:185).

Other important features include the *loko pu‘uone* of Hale‘iwa, ‘Uko‘a Pond and Loko Ea. Beginning in pre-Contact times, these have been a valuable aquacultural resource, as is discussed in 8.4. These ponds were controlled by *ali‘i* and were associated with three *‘aumakua* (gods,

deified ancestors) who protected the ponds, produced generous amounts of fish, and took care of the health and well-being of the *‘ohana* of Wailua. They are Niukala the shark god, Puhi‘ula the eel god, and the most well-known is Laniwahine, the *mo‘o* whose forms include lizard and woman.

> Laniwahine was the guardian (kia'i) of 'Uko'a at Waialua, and 'Uko'a was regarded as the long house (hale hālau) where she lives. She was a native of 'Uko'a and all her deeds centered about that place. The "native sons" (keiki kama'aina) of 'Uko'a never failed to recognize her deeds, but few of her descendants are now left or perhaps none. 'Uko'a was a very strange fishpond in which lived extraordinary fishes. A fish might be a kumu fish on one side and on the other side a mullet; or on one side weke pueo, and on the other mullet; or on one side might be a silver white like a white cock; when scaled, the skin might be stripped and variegated inside. It was clear to all her descendants that these strange fish belong to Laniwahine and it was not right to eat them. But the mullet of 'Uko'a were full of fat, when, as in all such pond, the native guardian of the pond was remembered. (Kamakau 1991:84)

9.3 Historic and Cultural Properties

The area surrounding the Project site is rich with cultural features, which indicate that the *ahupua‘a* were significant in pre-contact O‘ahu. In the 1930s, Gerald McAllister of the Bishop Museum, recorded thirteen sites in Pa‘ala‘a, comprised of the *heiau* of Kamani, Kapukapuākea, Lonoakeahu, Pu‘upilo, and Hekili, the altars of Punakai and Kumailia unu, the *ko‘a* (fishing shrine) of Ka‘ohe, the Pōhaku Lanai at Kaiaka Point, Kūpaoa Point, a kahuna’s (priest) residence called Punakai, the site of the Halemano cannibal feasts at the Pā‘aikana enclosure, and Laukī‘aha Spring.

Mrs. Awai-Lennox describes the Project area and environs as having cultural and historic significance. The wetlands were fed by *auwai* and *ali‘i* were known to have bathed in the fresh water fed by area springs. Speaking of the larger environs surrounding the Project footprint she says, “We are certain the *ali‘i* enjoyed the balmy weather and abundance of food [in the area],” explaining that Queen Lili‘uokalani had a home near Anahulu stream.

9.4 Marine and Freshwater Resources Including Fish

The Project area includes multiple water resources including the ocean, Anahulu River, and the wetlands. Uncle Henry, Mrs. Awai-Lennox, Mr. Asato, and Mrs. Causey all comment on how their memories of the waters in the area are that it was clean and abundant with fish. Mr. Asato recalls that the rivers were full of *‘ōpae and* mullet and people gathered *limu ‘ele‘ele*. Uncle Henry adds that *limu* used to be particularly abundant in this area, especially *‘ele‘ele* and *manauea*, which people would gather Ali’i Beach because it had sufficient amounts for family parties.

In the 1950s, Uncle Henry lived off the land at Ali‘i Beach, catching fish, gathering *limu* and surfing. Other plentyiful fish include, *‘āweoweo, halalū* and *akule*, during certain seasons that would draw fishers all along the coast. Uncle Henry also remembers the *‘āweoweo* coming in by

the thousands, where the ocean would turn red because there was so much fish. Mr. Asato describes how fisherman used to stand on Pohaku o Lanai at Kaiaka Beach Park to watch for fish. They would strike the rock when fish were sighted to let other fisherman know that the schools were running. Since the harbor was built, and the area has been developed more and more, fish are less abundant and the water quality is poorer.

Mrs. Awai-Lennox expands on the wetlands near the Project area. “This area [including the Project area] has vegetation and animal life of its own that’s unique to the wetlands. At one time when the waters were clean there were *‘o‘opu* and freshwater shrimp—*‘ōpae*, lots of crayfish like they have in Florida, and now there are lots of dark tilapia, the inedible ones,” she recalls. “I loved the ‘ōpae that Aunty Matlida prepared. She would clean it, then *pa‘akai* (salt), and *lomi* (rub with fingers) it around. If there was an abundance of it she’d cook and dry it,” she explains. Otherwise they ate it raw. She also recalls, “two types of clams: one like a half moon, the other conical.” Unfortunately, Mrs. Awai-Lennox says these delicacies are hardly available at all now and those that are left are not safe to eat due to pollution.

In pre-Contact times, *loko pu‘uone* were controlled by *ali‘i* and were associated with three *‘aumakua* (gods, deified ancestors) who protected the ponds, produced generous amounts of fish, and took care of the health and well-being of the *‘ohana* of Wailua. They are Niukala the shark god, Puhi‘ula the eel god, and the most well-known is Laniwahine, the *mo‘o* whose forms include lizard and woman. Cultivated fish include *‘ama‘ama, āholehole, ‘o‘opu,* and *moi* among others (Wyban 1992:27-40). The unique ecosystem the ponds form has also been home to waterbirds such as the *‘alae ‘ula* (Hawaiian mudhen) and *‘alae ke‘oke‘o* (Hawaiian coot), *‘auku‘u* (black-crowned night heron) (Wyban 1992:26).

These fishponds continue to be important features of the cultural landscape. Mrs. Causey relays stories of how her 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 in Kawaialoa. (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 *āholehole*.

9.5 Cultivation and Gathering of Terrestrial Plants

The rich taro lands of the Waialua District were located near the coast in the *ahupua‘a* of Pa‘ala‘a and Kawailoa. The one closest to the Project area is the largest, by far. It was centered on the Anahulu River/Kawailoa Gulch system that feeds into Waialua Bay, and includes the extensive wetlands and fishponds at ‘Uko‘a and Lokoea. In pre-Contact times, this system likely supported several thousands of families including many chiefs and high-status individuals. Kirch’s (1992) archaeological study of the Anahulu Stream demonstrated clearly that cultivation of this drainage extended several miles into the interior. In the upper reaches of the Anahulu, swidden planting practices, supported by seasonal or temporary habitation sites, were replaced by the later eighteenth to early nineteenth centuries with more intensive modification of the landscape (e.g., formal artificial terracing and irrigation ditches) and more permanent settlement in response to increasing population pressures in the lowlands. Recent archaeological surveys provide further support. For example, Chiniago (1979) interpreted Site 1441(located in Hale‘iwa, near the Anahulu River, on the *mauka* side of the present Kamehameha Highway) as a remnant of an old wetland taro terrace system.

The other major wet-taro cultivation and settlement center, to the northeast of the Project area, was Waimea Valley, which being much smaller than the agricultural heart of Waialua Moku, likely supported on the order of one or two hundred (rather than thousands of) families. The details of this arrangement are beyond the scope of this CIA.

It seems clear, based on physiographic characteristics, archaeological data, and ethno-historical information that the vicinity of the Project area has been used for cultivation of foodstuffs such as taro, breadfruit, and that fishing was also important.

Mrs. Awai-Lennox (whose family has lived as early as the Mahele on kuleana land near the Project area) explains that they had their taro lands, breadfruit, coconuts, and bananas. Tending and eating taro was central to their life. “We never bought *poi* for over fifty years!” she reminisces. During her childhood (in the 1930s and 1940s) they had taro and rice growing on their property and in the area between their property and the Project area. “We had leased to an old Chinese family to do rice and they used water buffalo [to plow],” she recalls.

Beyond cultivation, Mrs. Awai-Lennox and her siblings also utilized the uplands for fruit. She recalls gathering guava and passion fruit which they used to make juice. Some would be stored in freezers for later use. Another plant they collected was the *kiawe.* Mrs. Awai-Lennox and her siblings collected the seed pods or beans as one of their chores. *Kiawe* was used for fodder for the cattle and pigs kept by her father’s youngest sister who lived above Waiamea Bay. Other plants her family valued for their aesthetic qualities including gingers (especially white but also red and yellow) and *hala.* For celebrations they gathered other special flowers such as the *kukuna-o-ka-lā* for lei. [This literally means ray of the sun and refers to the stiff yellow to red calyxes, or outer parts of the flower, resemble the sun’s rays and grow on mangroves (Pukui and Elbert1986:178).]

As children, Mrs. Causey and her friends used to collect Ganduli beans for their sap so they could make homemade stilts by walking on old cans of Carnation evaporated milk. The sticky Ganduli Bean sap made them adhere to their feet. Mrs. Causey also recalls that people gathered seaweed at Police Beach, at what is known as Police Beach.

9.6 Birds (Manu)

Mrs. Awai-Lennox relays multiple examples of how birds have been and continue to be important in the area. Perhaps most relevant is the *‘alae ‘ula* (Common Hawaiian Moorhen), an endemic water bird. It was present when she was growing up and, she still sees them daily in the wetlands near their home in direct proximity to the Project area. When it flew close to their family home and cried, they believed it meant that someone would pass away. Her cousin who is about 90 years old also remembers that. Her younger son who was a dedicated practitioner of *lua* (Hawaiian martial arts) did research on their genealogy, and learned that Ke‘u, a family name, is an onomonopia for the call of the *‘alae ‘ula* call. Their family feels connected to the bird. “We still have here them in the area,” she added. Another native water bird she sees regularly in the area is the Hawaiian stilt. Mrs. Awai-Lennox also mentions the stories her father told about retrieving plover for Prince Kūhio, who was fond of hunting them, and about the lights on Mount Ka‘ala at night, which were from people hunting for wild turkeys. Peacocks and wild turkeys are abundant there, she explains.

The loko pu‘uone in Hale‘iwa have been a habitat for waterbirds such as the ‘alae ‘ula (Hawaiian mudhen) and ‘alae ke‘oke‘o (Hawaiian coot), ‘auku‘u (black-crowned night heron) (Wyban 1992:26), although their presence today is certainly less obvious than in past decades.

9.7 Hale‘iwa Town

Kama‘āina and *kūpuna* are nostalgic about growing up and living in and near Hale‘iwa Town. Jerry’s Restaurant, where hamburgers were five for one dollar, the movie theaters, and world class surfing are prominent memories described by community participants. Hale‘iwa Hotel is another important facet of the area where prominent people stayed. In the twentieth century, the Hale‘iwa Hotel was an attraction for wealthy and high status visitors. It continued to operate in the first decades of the 20th century. Manabu Nonaka exclaimed, “Oh, it was big hotel. In those days, let’s say 1920, it was comparable to Royal Hawaiian, because Haleiwa used to be a tourist town…you could tell that it [Haleiwa Hotel] was a tourist place, because only the rich people could go in there and eat there.” (UH 1977:432) Sam Nishimura recalled, “All the honeymooners used to come on the train and stop at the Haleiwa Hotel” (UH 1977:413). Lucy Robello said, “I remember the Haleiwa Hotel. Was very nice. Something really nice to see. And that’s where like the royal people used to come and spend their time over there. They used to have some great dances and things over there. Really nice times. That was for the higher class people…. Queen Emma used to come…,the royal ones [Hawaiians] and then the richer *haoles* like the Bishops, what do you call…Castle and Cooke, the big Bishop Estate owner…” (UH 1977b215). The Hotel was taken over by the U.S. Army in the 1930s, serving as a center for recreational activities by military personnel in Hale‘iwa during World War II.

In 1984 the City and County of Honolulu established the Haleiwa Historic, Scenic and Cultural District, mandating preservation rules and new construction constraints for Haleiwa Town. The present Project area falls into this District.

9.8 Surfing

Waialua is famous for its ocean and surf. Uncle Henry is a part of the ocean traditions in Hawai‘i and is well known throughout the islands and around the world. He has surfed just about every surf break on this side of the island including, Laniakea, Puena, Pipeline, Ali’i Beach, Alligators and Chun’s Reef among others. One of the things that he values the most about surfing in Waialua is the number of breaks that are there and are good. “Some beaches have really good waves but only have one or two surf breaks, but that is what’s good about this coast, there are lots of breaks so it doesn’t have to get competitive or crowded.” The North Shore is world famous for its surf competitions, many of which are in direct proximity to the Project area.

9.9 Burials

Based on archeological evidence and community consultation, there are no identified burials in the Project area

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Section 10 Summary and Recommendations

10.1 Results of Background Research

Background research for this Project yielded the following results (presented in approximate chronological order):

1. The Project is located in Waialua district’s Hale‘iwa Town which is divided between Kawailoa Ahupua‘a and Pa‘ala‘a Ahupua‘a. The Project footprint is within the *makai* (seaward) portion of Kawailoa Ahupua‘a and in direct proximity to the *makai* (seaward) portion of Pa‘ala‘a Ahupua‘a. This area was part of the rich taro lands that were located near the coast in the *ahupua‘a* (land division usually extending from the uplands to the sea) of Pa‘ala‘a and Kawailoa, on the eastern end of Waialua district. Unlike most *ahupua‘a*, the boundary between these two areas does not follow the contours of the land, but rather seems to have been drawn to share the rich taro lands between these *ahupua‘a*. In historic maps, the boundaries of the Project site are designated in Pa‘ala‘a. For example, in and 1883 map entitled the “Konohiki Lands in Paalaa” (Figure 9), the former taro lands west of the Anahulu River (which appears to include the Project aera) are designated as part of “Pa‘ala‘a Lands.” In 1915 “Pa‘ala‘a Kai Subdivision” was built in this area (Podmore 1915), and the surrounding area today (including the Project area) is often referred to by the same name, although it is within the *ahupua‘a* of Kawailoa according to both OHA and USGS current *ahupua‘a* boudaries. Even though the Project area is within the boundaries of Kawailoa Ahupua‘a, much of the history of the Project area is more closely aligned with the sense of place in Pa‘ala‘a and the town of Haleiwa. For these reasons, the background section of this report includes aspects of both Pa‘ala‘a and Kawailoa Ahupua‘a.

2. The district of Waialua is rich in legends, stories, proverbs, and myths. According to one tradition, Waialua means “two waters” which refers to two large stream drainages (Anahulu and Helemano-Poamoho-Kaukonahua) that once irrigated extensive taro fields in the *ahupua‘a* of Kamananui, Pa‘ala‘a, and Kawailoa.

3. The area surrounding the Project site is rich with cultural features, which indicate that the Kawailoa and Pa‘ala‘a Ahupua‘a were significant in pre-Contact O‘ahu. In the 1930s, Gerald McAllister of the Bishop Museum, recorded sites in Pa‘ala‘a, comprised of the heiau (place of worship) of Kamani, Kapukapuākea, Lonoakeahu, Pu‘upilo, Kepuwai, and Hekili, the altars of Punakai and Kumailia unu, the ko‘a (fishing shrine) of Ka‘ohe, the Pōhaku Lana‘i at Kaiaka Point, Kūpaoa Point, a kahuna’s (priest) residence called Punakai, the site of Pā‘aikana enclosure in Halemano, and Laukī‘aha Spring (McAllister: 1933, 132-43).

4. Well-known traditional accounts associated with the area include the chief Lo-Lale and his wife Kelea. Lo-Lale was the brother of the high chief of O‘ahu Piliwale, whose court was established at Waialua. Piliwale desired that his brother marry in order to strengthen

their court. Kalonaiki, their mother had married Kikinui and “thus infused into the family the native and aristocratic blood of Maweke, of the ancient line of Nanaula”. (Kalakaua, 1990: 232) Lo-Lale’s cousin Kalamakua embarked on a quest to find a wife, he returned with Kelea, sister to the Kawao Mō‘ī of Māui. Although this union did not last the couple had three children, one of whom Kaholi married his cousin, Kohipa, the daughter of Piliwale and sister to his successor Kukaniloko. Kelea married Kalamakua the aforementioned cousin of Lo-Lale. Together they had one daughter Laielohelohe who later became the wife of Piilani. (Kalakaua, 1990:228-246) Another account associated with the area include the cannibal chief ‘Aikanaka (lit. “cannibal”, “man-eater”) of Pa‘ala‘a Ahupua‘a. The many sources for this story attest to its notoriety. The gist of the story relates that (perhaps circa A.D. 1750), a powerful wrestler and boxer, often said to have been a foreigner, retired with a few followers in the uplands of Pa‘ala‘a where they dined on the flesh of hapless travelers until the leader was killed by the brother of a victim. McAllister (1933) placed the area known as the Pā ‘Aikanaka (“Man-eater’s enclosure”) eight miles east of Hale‘iwa but noted that nothing remained. Another well-known *mo'olelo* (story) is that of Laniwahine, who took various forms as a *mo'o* (lizard) and a woman as the guardian of 'Uko'a Pond at Waialua.

5. The Project site is in proximity to Kaiaka (“shadowed sea”) Point on Kaiaka Bay toward the western side of Waialua Bay. Kaiaka Point was the site for a large balancing rock, or pōhaku, called Pohaku o Lanai. The point near the northern coastal boundary of Pa‘ala‘a was called Kūpaoa (“strong, permeating fragrance”), which may have referenced jasmine, or night cestrum, which was used to scent kapa (Pukui and Elbert 1986:185).

6. The history of Pa‘ala‘a Ahupua‘a must also be viewed in the wider context of the Waialua District. 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 Hawaiian Islands.

7. In approximately A.D. 1310 (a time estimate based on an average length of generational intervals in chiefly geneaologies), Maweke partitioned O'ahu into three districts: Kona, the 'Ewa, Wai'anae, and Waialua region, and the windward Ko'olau region. Then, in approximately A.D. 1490, the 'aha ali'i (council of chiefs) chose Ma'ilikukahi, an ali'i kapu who was born at Kukaniloko, to be the new ali'i nui (paramount chief) of O'ahu. After his paramountship was installed at the heiau of Kapukapuakea (Site 225; McAllister 1933:140) in central Waialua, Ma'ilikukahi instituted an explicit land division and administration structure: O'ahu was divided into six moku (districts): Kona, 'Ewa, Wai'anae, Waialua, Ko'olauloa, and Ko'olaupoko-that were further divided into 86 ahupua'a and smaller territorial units (Kirch 2010:84-90).

8. The chiefly rank Lo is known as the chiefs of Lihue, Wahiawa and Halemano on Oahu, they were called Lo chiefs or po‘e Lo Ali‘i {“people from whom to obtain a chief”}.They were known to live in the mountain areas and were admired for their strict adherence to the kapus associated with their rank. “. . if a kingdom was without a chief, there in the mountains could be found a high chief (ali‘i nui) for the kingdom. Of if a chief was without a wife, there one could be found-one from chiefly ancestors”. Ancestors of the

Lo chiefs include, “Kauakai‘ailani, Ma‘ilikukahi, Kalona, Piliwale, Kukaniloko, Pa‘akakanilea {Pa‘akanilea}, Ka‘akauualani, Ka‘au, Lale, Paoakalani, Pakapakakuaua, Nononui, Kokoloea, and a great many others”. (Kamakau, 1964:5)

9. The Lo chiefs are also decendants “from Ulu and Nanaulu, sons of Ki‘i, twelfth in succession from Wakea and Papa, all high chief families count descent. . . the important Meweke family is , according to Kamakau, the first of that line form whom men today trace ancestry.”(Beckwith, 1970: 352) “The coming of Maweke and his sons to the Hawaiian group is dated sometime between the eleventh and twelfth centuries; Their descendents are supposed to have occupied the whole of Oahu and spread to the island of Kauai, Maui and Molokai, and hence some say, the differences in speech and custom between these islands and Hawaii.” Maweke had three sons who each inherited his lands on the island of Oahu. Mulieleali‘i received the lands on the south side, Keaunui settled the western end and Kalehenui the northern end. Mulielealii has three sons, Kumuhonua the eldest, Moikeha and Olopana. Kumuhonu establishes the line of ruling chiefs on Oahu until Haka, then the Moikeha line begins with Ma‘ilikukahi. (Beckwith, 1970: 352-353)

10. In Hale‘iwa, are two spring-fed loko pu'uone (brackish, sand banked ponds near the shore connected to the sea by a stream or ditch). Beginning in pre-Contact times, ‘Uko‘a Pond and Loko Ea have been used to cultivate fish including ‘ama‘ama (mullet), āholehole (young Hawaiian flagtail), ‘o‘opu (goby), and moi (threadfish) among others (Wyban 1992:27-40). The ponds have also been home to waterbirds such as the ‘alae ‘ula (Hawaiian mudhen) and ‘alae ke‘oke‘o (Hawaiian coot), ‘auku‘u (black-crowned night heron) (Wyban 1992:26). In pre-Contact times, these ponds were controlled by ali‘i and were associated with three ‘aumakua who protected the ponds, produced generous amounts of fish, and took care of the health and well-being of the ‘ohana of Wailua. The most well-known is Laniwahine, the mo‘o whose forms include lizard and woman.

11. Beginning in the early 1800s, the sandalwood trade initiated economic and cultural transformations in Waialua Moku. It was the strict monopoly of the ali‘i (chief) beginning with Kamehameha. The demands put on the maka‘āinana (commoners) to harvest wood for trade caused many taro fields to become fallow. These were later used by Chinese immigrants for rice farming. As the sandalwood trade collapsed in the 1830s, Protestant missionaries were establishing their presence in Waialua.

12. During this time, whaling enterprises were emerging to fill the void and activity at Waialua. The islands became a victual and layover base in the mid-Pacific. From the 1840s into the early 1860s the Hawaiian economy focused on supplying whale ships during their long layovers. With the dwindling of ship arrivals during the 1860s, many people in districts like Waialua which had been dependent on the victualing trade migrated to Honolulu and other parts of O‘ahu.

13. Following the death of Victoria Kamāmalu in 1866, Pa‘ala‘a Ahupua‘a, along with her many other land holdings, was passed on to successive members of the ali‘i, ending up being part of the Princess Bernice Pauahi Bishop Estate (i.e. Kamehameha Schools).

14. 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. These rice growers had settled after fulfilling their contracts with the sugar plantations. Into the 20th century, rice continued to be cultivated in the Waialua District (including Pa‘ala‘a), and other areas within the Hawaiian Islands. However, it declined steadily during the decades leading up to World War II.

15. The Hale‘iwa Hotel continued to operate in the first decades of the 20th century. It was taken over by the U.S. Army in the 1930s, serving as a center for recreational activities by military personnel in Hale‘iwa during World War II.

16. 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 Manabu Nonaka and Lucy Robello (from Portugual) convey the value of natural resources to local diets (e.g. fish and semi-wild fruit trees), in children’s play, and in creating a sense of place. Through their stories, we also learn that the water in Anahulu Stream and Hale‘iwa Bay were clearer and more productive; and we hear about early interactions between locals and tourists on the North Shore; the social activity that centered around Haleiwa Hotel and it prestigious guests, including Queen Emma and Charles Bishop; and the commercial side of Haleiwa town in the early 1900s.

17. In 1984 the City and County of Honolulu established the Haleiwa Historic, Scenic and Cultural District, mandating preservation rules and new construction constraints for Haleiwa Town. The present Project area was probably under sugar cultivation till residential use around the 1930s. Based on oral histories, the Waialua Agricultural Company had this parcel, possibly with a “motor pool” type facility. The Ohama family used the parcel for a gas station and residential occupation untill around 1954 (per. comm. Ms. Laura Takahashi, Fritz Johnson Architects). The parcel has been utilized as a residence, without the gas station operating, since 1954.

10.2 Results of Community Consultation

CSH attempted to contact 22 community members and government agency and community organization representatives. Of the nine individuals that responded, four of these kūpuna and/or kama‘āina participated in interviews for more in-depth contributions to the CIA. At the present time, all interviews have been reviewed and approved by the participants for inclusion in this CIA. This community consultation indicates:

1. Kama‘āina view the Project area as part of a storied landscape populated by ali‘i and cultural resources. Mrs. Awai-Lennox describes the environs as having cultural and historic significance. The wetlands were fed by auwai and ali’i were known to have bathed in the fresh water fed by area springs. Speaking of the larger environs surrounding the Project footprint she says, “We are certain the ali‘i enjoyed the balmy weather and abundance of food [in the area],” explaining that Queen Lili‘uokalani had a home near Anahulu stream.

2. Kama‘āina maintain a strong connection to the environs surrounding the Project area by lived experiences with its freshwater resources. Mrs. Awai-Lennox describes how at one time when the waters were clean there were ‘o‘opu (goby, see Appendix B. Common and Scientific Names for Plants and Animals Mentioned by Community Members for a complete listing from the report), freshwater shrimp—‘ōpae, two types of clams, and crayfish. She says the water quality has declined, these delicacies are hardly available at all now, and the water is populated with inedible dark tilapia. Mr. Asato also recalls the Anahulu River being clean and full of fish, especially mullet and ‘opae. People could be found along the river mouth gathering limu ‘ele‘ele. Times have changed according to Mr. Asato and these fish and limu are scarce today.

3. Mrs. Awai-Lennox explains how the landscape looks and how the land is being used has changed since she was young. As a child, she and her family had taro and rice growing on their property and in the area between their property and the Project area. “We had leased to an old Chinese family to do rice and they used water buffalo [to plow],” she recalls. Beyond rice, other plants were introduced and became common. For example, she names the lotus, or hasu (Japanese). Now she says the area is overgrown and not tended.

4. The area has been valued as a recreational site by all ages. In addition to the ocean recreation activities, as children, she and her siblings swam in Ananhulu Stream. “Back then, the water was clean!” she recalls. Mrs. Awai-Lennox also remembers her father talking about a race track, somewhere near their home in the wetlands and grasslands area. She estimates it may have existed during Liliuokalani’s time in Hale‘iwa. Hunting (for birds and pigs) and fishing were other recreational activities that were popular in the area at that time.

5. The Waialua coast is well known for its surfing traditions. Today the he‘enalu areas or (surfing spots) are known by various names including Laniakea, Puena, Ali‘i Beach and more. Mr. Henry Preece, or Unlce Henry, has been influential in the surfing traditions in the Wailua area and throughout the world. He has passed down histories of this area and inspired future generations of ocean men and women. Today surfing has grown exponentially since Uncle Henry moved to Haleiwa from Waikele/Waipahu area in 1953.

6. The Project area and environs are sources of plants that are valuable resources for food, medicine, ornamental and other uses. Mrs. Awai-Lennox recounts how she and her siblings collected kiawe (mesquite) seed pods for fodder and they gathered guava and passion fruit for juice. For special occasions her family gathered hala (pandandus) and kukuna-o-ka-lā (mangrove flowers) for lei. In proximity to the Project area, Mrs. Awai-Lennox says that although the wetlands aer overgrown now, “If you look hard enough, you’ll still see some Hawaiian plants: honohono grass, pōpolo—which was occasionally used medicinally. There’s a creeping water violet and a clover, a large clover leaf that is found only around wetlands.” In terms of cultivated plants, she explains that they had their taro lands, breadfruit, and bananas, which still exist to some extent but their supplies have diminished. She points out that although they still have many coconuts, little taro is available on their property compared to the past.

7. The Project area and ocean environs are also valuable resources for food, medicine, ornamental and other uses. Mr. Asato remembers fisherman standing on the pohaku (rock), called Pohaku o Lanai. To his knowledge the fisherman would stand on the rock to watch for fish and strike the rock when fish were sighted to let fisherman know that the schools were running. During certain seasons fish would run in that area, the halalū and akule would come in and people would be all along the coast. They still come in today but not the way they used to. Another fish that would run along this coast was the ‘āweoweo, a red fish. Uncle Henry remembers them coming in by the thousands, turning the ocean red. Since the construction of the harbor he has observed that the fish do not seem to be as plentiful or come in shore as they used to regularly.

8. Birds are another important cultural resource in the area. Mrs. Awai-Lennox relays multiple examples of how birds have been and continue to be important in the area. Perhaps most relevant is the ‘alae ‘ula, an endemic water bird, which is rare but still found very near the Project area in freshwater marshy areas. It was present when she was growing up and, she still sees them daily in the wetlands near their home in direct proximity to the Project area. Mrs. Awai-Lennox describes peacocks and wild turkeys as abundant and hunted.

9. Community members have a number of recommendations for the Project. Both Mr. Sato and Uncle Henry recommend that rather than the conventional raised curbed sidewalks, the Project consider non-elevated sidewalks without curbs. They suggest these will provide safety for pedestrians while also accommodating local drivers who do not want to see street parking diminished. They would also like to see cross walks put in for safety reasons as well.

10.3 Recommendations

Based on the information gathered for the cultural and historic background and community consultation detailed in this CIA report, CSH foresees no 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. However, CSH foresees the following potential impacts on cultural, historic, and natural resources, and makes the following recommendation:

1. Based on background information, pre- and post- contact cultural resources, including evidence of habitation, agricultural sediments and burials have been documented within the vicinity of the Project Area. Thus, should cultural materials including burial sites, artifacts, and subsurface cultural layers be identified during ground disturbance, all work in the immediate area should cease and the appropriate agencies pursuant to applicable law should be notified.

2. There are a significant number of important cultural and environmental resources in the vicinity of the Project area. The Anahulu River has been documented as an important resource for the community. CSH recommends that Kamehameha Schools work with the

community to raise awareness of these sites and resources. Kamehameha encouraged both commoners and ali`i to farm and fish and “he himself would fish and continue his laborious efforts at carrying rock or timber” (McKeague, 2002: 23). He worked to restore Kawailoa’s Uko`a pond, and Kamehameha II (Liholiho) subsequently visited the ponds. As a result, it can be concluded that these areas have been recognized not only as natural resources, but also as cultural resources. KS should continue to mālama (care for) these resources and related ones in the area due to their importance to Hawaiian culture and the unique biodiversity of the area that has supported by Hawaiian cultural activities such as aquaculture and taro cultivation. KS should also consider attending to environmental concerns and relationships to adjacent wetland areas, such as those in direct proximity to the Project area where ali‘i are known to have frequented and where native flora and fauna have thrived.

3. Haleiwa is a Special District with unique design controls, it is recommended that the developer stay with in the state guidelines for this district. It is important to members of the community that the rural scale and character of the area be considered during design conception and development. Haleiwa town provides a historical encounter with a rural commercial setting and as a result attracts *kama‘aina* and numerous tourist to this area. Padestrian safety should be a priority as well, including cross walks and the adoption of non-elevated sidewalks without curbs, rather than the conventional raised curbed sidewalks is recommended. This will provide needed increased safety for pedestrians while also accommodating parking for local drivers.

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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.

Hawaiian Word	English Translation
āholehole	Young Hawaiian flagtail
ahupua‘a	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 (pua‘a), or because a pig or other tribute was laid on the altar as tax to the chief.
‘alae ke‘oke‘o	Hawaiian coot
‘alae ‘ula	Hawaiian mudhen
ala hele	Pathway, route, road, way to go, itinerary, trail, highway, means of transportation
ali‘i	Chief, chiefess, officer, ruler, monarch, peer, headman, noble, aristocrat, king, queen, commander.
‘ama‘ama	Mullet
‘auku‘u	Black-crowned night heron
he‘enalu	Surfing
heiau	Pre-Christian place of worship, shrine; some heiau were elaborately constructed stone platforms, others simple earth terraces. Many are preserved today.
‘ili	Land section, next in importance to *ahupua‘a* and usually a subdivision of an *ahupua‘a*.
ilina	Grave, tomb, sepulcher, cemetery, mausoleum, plot in a cemetery.
iwi kūpuna	Ancestral bone remains (common).

Hawaiian Word	English Translation
kahuna	Priest, sorcerer, magician, wizard, minister, expert in any profession. Kāhuna—plural of kahuna
kama‘āina	Native-born, one born in a place, host; native plant; acquainted, familiar, *Lit.*, land child.
kuleana	Right, privilege, concern, responsibility, title, business, property, estate, portion, jurisdiction, authority, liability, interest, claim, ownership, tenure, affair, province; small piece of property, as within an ahupua‘a;
kupuna	Grandparent, ancestor, relative or close friend of the grandparent's generation, grandaunt, granduncle. Kūpuna—plural of kupuna.
lo‘i	Irrigated terrace, especially for taro, but also for rice; paddy.
loko i‘a	Fishpond (common).
loko pu‘uone	Brackish, sand banked ponds near the shore connected to the sea by a stream or ditch
makai	Ocean.
makana	Gift, present.
mauka	Inland.
mele	Song, anthem, or chant of any kind; poem, poetry; to sing, chant.
moi	‘threadfish
moku	District, island, islet, section
mo‘olelo	Story, tale, myth, history, tradition, literature, legend, journal, log, yarn, fable, essay, chronicle, record, article; minutes, as of a meeting. (From mo‘o ‘ōlelo, succession of talk; all stories were oral, not written).
nā	Plural definite article. Nā lani, the chiefs.
‘ōlelo no‘eau	Proverb, wise saying, traditional saying.
oli	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.

Hawaiian Word	English Translation
o‘opu	goby
wahi pana	Storied place (common). Legendary place.

Appendix B Common and Scientific Names for Plants and Animals Mentioned by Community Participants

Common Names		Possible Scientific Names		Source
Hawaiian	**Other**	**Genus**	**Species**	
āholehole	juvenile *āhole* (Hawaiian flagtail)	*Kuhlia*	*xenura*	Hoover 2003
akule	big-eyed scad	*Selar*	*crumenophthalmus*	Hoover 2003
‘alae‘ula	Hawaiian common moorhen	*Gallinula*	*chloropus*	Pukui and Elbert 1986
‘āweoweo	bigeye	*Heteropriacanthus*	*cruentatus*	Hoover 2003
‘āweoweo	bigeye	*Priacanthus*	*meeki*	Hoover 2003
guava		*Psidium*	*guajava*	Wagner et al. 1999
hala		*Pandanus*	spp.*	Wagner et al. 1999
halalū	6-7 inch juvenile akule	*Selar*	*crumenophthalmus*	Hoover 1993
hasu (Japanese)	lotus	*Nelumbo*	*nucifera*	Imada et al. 2005
hau	beach hibiscus	*Hibiscus*	*tiliaceus*	Wagner et al. 1999
honohono	grass	*Commelina*	spp.	Imada et al. 2005
honohono	grass	*Oplismenus*	*hirtellus*	Imada et al. 2005
kalo	taro	*Colocasia*	*esculenta*	Wagner et al. 1999
kiawe	mesquite	*Prosopis*	*pallida*	Wagner et al. 1999
kukuna-o-ka-lā	mangrove	*Bruguiera*	*gymnorrhiza*	Imada et al. 2005
limu ‘ele‘ele	seaweed, algae	*Entermorpha*	*prolifera*	Abbott and Williamson 1974

Common Names		Possible Scientific Names		Source
Hawaiian	**Other**	**Genus**	**Species**	
limu manauea	seaweed, algae	*Gracilaria*	*coronopifolia*	Abbott and Williamson 1974
‘o‘opu	goby, blennie	general name for fresh and salt water fishes included in the families Eleotridae, Gobiidae, Blennidae, Microdesmidae		Hoover 1993
‘ōpae	shrimp	general name for shrimp		Pukui and Elbert 1986
pia	arrowroot	*Tacca*	*leontopetaloides*	Imada et al. 2005
pōpolo	glossy nightshade	*Solanum*	*americanum*	Wagner et al. 1999
tī		*Cordyline*	*fruticosa*	Wagner et al. 1999
	banana	*Musa*	spp.*	Wagner et al. 1999
	breadfruit	*Artocarpus*	*altilis*	Imada et al. 2005
	coconut	*Cocos*	*nucifera*	Wagner et al. 1999
	Hawaiian stilt	*Himantopus*	*mexicanus knudseni*	Hawaii DLNR 2005a
	Ganduli bean			
	tilapia	*Sarotherodon*	spp.	
	turkey	*Meleagris*	spp.	
	guava	*Psidium*	*guajava*	Wagner et al. 1999
	mango	*Mangifera*	*indica*	Wagner et al. 1999
	mullet	*Mugil*	*cephalus*	Hoover 1993
	passion fruit	*Passiflora*	*edulis*	Wagner et al. 1999

Common Names		Possible Scientific Names		Source
Hawaiian	**Other**	**Genus**	**Species**	
	peacock	*Pavo*	spp.	
	plover	*Pluvialis*	*fulva*	Hawaii DLNR 2005b

Appendix C Place Names of Kawailoa and Pa‘ala‘a Ahupua‘a

Kawailoa Place Names

Place Name	*Type*	Meaning	Comments
--	*akua* [god] *stone*		“Site 232. Akua stone, Anahulu river, Waialua. A stone which formerly blocked the entrance of the Anahulu River and was side to be sacred. This stone was just beneath the water and was said to be occasionally exposed. Some years ago when it was removed in order that the glass-bottomed boat and sampans might use the river, much anxiety was shown by the Hawaiians, for fear of evil effects.” (McAllister 1933:141)
--	*akua stone*		Site 233. “Site 232 [*sic*, should be Site 233]. Akua stone, Anahulu River, Waialua. A small fresh-water pond covering 2.5 acres, still in use. The present pond is divided from a small stream, into which its outlets (*makaha*) open by a stone and earth embankment. Its other sides are formed by the natural contours of the land.” McAllister 1933:141)
--	stone		“Site 235. Stone with curative powers, near Puaena Point... a smooth, oval-shaped stone about 2 feet high and 4 feet long which represents a woman known as Puaena who came in the following of Pele from Tahiti. For its curative powers the stone was famous and Hawaiians came to visit it from all parts of Oahu.” (McAllister 1933:142).
Anahulu (Kamani)	*heiau*	*kamani* - a large tree (*Calophyllum inophyllum*) (Pukui & Elbert 1986)	“Site 231. Anahulu heiau, Kamani, at the location of the present [1933] Haleiwa Hotel. When the hotel was being built the heiau was destroyed. This, according to the Hawaiian, accounts for the failure of the hotel. According to Thrum [who

Place Name	*Type*	Meaning	Comments
			called the heiau ‘Kamini’]... it was an ‘Unpaved heiau of large size with lime stone walls, of luakini class (McAllister 1933:141)
Kamani (Anahulu)	*heiau*		See Anahulu
Kawaipū‘olo	*spring*	bundle of water (McAllister 1933:141)	“Site 229. Kawaipuolo spring. . . When strangers passed here and asked for water, it was given to them in a taro-leaf cup; therefore . . .‘Bundle-of-water.’ . . . the spring suddenly disappeared at one time. After long search . . . it was discovered by the seer (*kilo*) at Makaula, near Kaena Point, on the hilltop now of the same name, Kawaipuolo. From here it was conveyed in one night by the menehunes in bundles of ti and taro leaves; hence the name, ‘The-bundled-water.’” (McAllister 1933:141)
Kepūwai	*heiau*	the sentinel's call of alarm, a trumpet call, as in war (Pukui & Elbert 1986)	“Site 228. The cemetery beside the church in Waialua marks the site of the heiau once known as Kepuwai. It has been completely destroyed [by 1933].” (McAllister 1933:141)
Maeaea	point	smelly (Pukui & Elbert)	See Pua‘ena Point
Puaena Point	point	issue hot, to glow brightly (Pukui et al. 1974)	“Site 234. At the death of Elani, who was greatly beloved by his people, his body was placed on a ledge of rocks near Puaena Point, where it was allowed to decompose. The place became known as Kahakakau Kanaka. As the odor came to the sands at Haleiwa they became known as Maeaea; the pond on the other side became known as Kupava [*sic*; should be Kūpaoa in Pa‘ala‘a].” McAllister 1933:141-142.

Place Name	*Type*	Meaning	Comments
Po‘o o Mo‘o, Wāwae o Mo‘o	stones	Head of the *mo‘o*, foot of the *mo‘o* (Pukui & Elbert)	“Site 230. Two stones known as moo [supernatural creatures], on either side of the Anahulu Stream above the old Haleiwa Seminary. One was named Poo o Moo and the other was known as Wawae o Moo. They are in no way different from ordinary stones, and can not be distinguished from other stones in the vicinity unless pointed out by one of the Hawaiians.” (McAllister 1933:141)
Pu‘upilo	*heiau*	hill [of the] swampy odor, or *pilo* [*Coprosma* spp.] plant hill (Pukui et al. 1974)	“Site 227. Puupilo heiau, seaward of the Haleiwa Courthouse, Paalaa. A slight elevation of land with an old coconut palm on the side is all that remains of this heiau.” (McAllister 1933:141)
‘Uko‘a	*loko*, fishpond		Site 236. “It is a long narrow fresh-water pond, approximately a mile in length. . . Laniwahine was the goddess (*moo*) of Ukoa and lived there with her brother Puhiula. Between the pond and the sea was a tunnel though which Laniwahine passed when she wished to bathe in the ocean. Offerings were left for her on a stone.” (McAllister 1933:142)

Pa‘ala‘a Place Names

Place Name	Type	Meaning	Comments
Pa‘ala‘a	*ahupua‘a*	sacred firmness (Pukui et al. 1974)	Recorded in Land Commission Award testimony
‘Ili ‘Āina (Subdivision of land smaller than ahupua‘a)			
A‘akala	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Hānau‘ewa	*‘ili ‘āina*	possibly, premature birth (Pukui & Elbert 1986)	Recorded in Land Commission Award testimony
Helemano / Halemanu	*‘ili ‘āina*	many snared or many going (Pukui et al. 1974)	Recorded in Land Commission Award testimony
‘Īna‘ikumu	*‘ili ‘āina*		Recorded in Land Commission Award

Place Name	Type	Meaning	Comments
			testimony
Kalie	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Kealapi‘i	*‘ili ‘āina*	the ascending road (Pukui & Elbert 1986)	Recorded in Land Commission Award testimony
Kūmalie	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Laukī‘ha‘a	*‘ili ‘āina*	low *laukī* shrub [*Cassia leschenaultiana*] (Pukui & Elbert 1986)	Recorded in Land Commission Award testimony
‘Ōpae‘ula	*‘ili ‘āina*	red shrimp (Pukui et al. 1974)	Recorded in Land Commission Award testimony
Waikaalulu	*‘ili ‘āina*		Recorded in Land Commission Award testimony
Wahi Pana (place names)			
Alamuki	stream	now called Opaeula	Land Commission Award testimony
Hale‘iwa	town	house [of] frigate bird (Pukui et al. 1974)	Named by early missionary
Halemano / Helemano	place	many houses (Pukui et al. 1974)	Upland Pa‘ala‘a

Place Name	Type	Meaning	Comments
Hekili	*heiau, pu‘uhonua*	thunder (Pukui et al. 1974)	Site 223. Hekili heiau, Pa[a]laa-uka, on the sea side of the twin bridges at Waialua. The site is said to be occupied by the Buddhist temple (TMK 6617:10). Thrum was told that the heiau was of luakini class and a place of refuge. Near the heiau was a fishing shrine known as Kaohe, according to Hookala (McAllister 1933:140)
Helemano	stream	many snared, or many going (Pukui et al. 1974)	Rises at about 2640 ft. elevation, joins Opaeula Stream at <20 ft. to form Paukauila Stream.
Kaiaka	point	PEM: shadowed sea. Said to be named for a person.	East point of Kaiaka Bay
Kalaeo‘iupaoa	point		Point on the east side of Kaiaka Bay, site of Pohaku Lanai (q.v.). (McAllister 1933:140)
Kamani	*heiau*	a large tree (*Calophyllum inophyllum*) (Pukui & Elbert 1986)	Site 231. Anahulu heiau, Kamani, at the location of the present [1932] Haleiwa Hotel. When the hotel was being built the heiau was destroyed. This, according to the Hawaiians, accounts for the failure of the hotel. According to Thrum it was an "Unpaved heiau of large size with limestone walls, of luakini class" (McAllister 1933:141).
Ka‘ohe	*ko‘a*	the bamboo (Pukui et al. 1974)	Site 223. Hekili heiau, Pa[a]laa-uka... Near the heiau was a fishing shrine (ko‘a) known as Kaohe... (McAllister 1933:140)."
Kapukapuākea	*heiau*		Site 225. Kapukapuakea heiau, Paalaa-kai, east end of Kaiaka Bay, on the sea side of the railroad track. The site is still remembered and pointed out, but nothing remains of the heiau. Thrum has this information: "A medium sized heiau of traditional menehune construction of kauila wood" (McAllister 1933:140).

Place Name	Type	Meaning	Comments
Kuaikua	place		"Kuaikua is located up in Halemano. It has a sacred spring and only those related to the supernatural ones who made and hid it, are allowed to bathe in it" (Sterling and Summers 1978:112).
Kukui‘ula	altar	red light (Pukui et al. 1974)	Site 224. “Punakai, Waialua... There is also said to have been an unu here by the name of Kukuiula." (McAllister 1933:140).
Kūmalie	stream		LCA 2879 bounded on the east by Kumalie muliwai
Kumailiaunu	altar		Site 222. Kumailia-unu was located on the sea side of the road just before [south of] the twin bridges in going toward Waialua. Truck gardens occupy the site." (McAllister 1933:140).
Kūpaoa	point	overwhelming smell (Pukui & Elbert 1986)	"Site 234.... As the odor [of decomposing bodies at Kahakakau Kanaka] came to the sands of Haleiwa they became known as Maeaea; the point on the other side became known as Kupaoa." (McAllister 1933:141-142).
Lā‘aukalakala	*pali* (cliff)		LCA 2802 bound on east by pali; LCA 2922:1 bound on west by pali
Laukī‘aha	spring		"Site 221. Laukiaha, the name of a spring once flowing near the present [1932] Waialua Soda Works into the Opaeula stream, on the mountain side of the twin bridges at Waialua." (McAllister 1933:140).
Laukī‘ha‘a (Paukauila)	stream	low laukī shrub, *Cassia leschenaultiana* (Pukui & Elbert 1986)	LCA 8826 bound on mauka and makai side by the stream; formed by the junction of Opaeula Stream and Helemano Stream, joined by Kiikii Stream near the mouth.

Place Name	Type	Meaning	Comments
Lonoakeahu	heiau		"Sites not located. 17. Lonoakeahu heiau, Keehu. Listed by Thrum: "A heiau of small size destroyed years ago; site now planted to cane." McAllister 1933:197.
Mamalio (Helemano)	stream		The "muliwai o Mamalio" adjoins claims no. 2859B by Kaluhia and no. 2856:1,2,3,4 by Kea. Now called Helemano Stream on USGS.
‘Ōpae‘ula	stream	red shrimp (Pukui et al. 1974)	Rises at about 2720 ft. elevation, joins Helemano Stream at <20 ft. to form Paukauila Stream.
Pā‘aikanaka	residence	man-eating enclosure (Pukui & Elbert 1986)	"Site 220. Pa Aikanaka, Halemano (Helemano or Halemanu), Paalaa, the site of the famous cannibal feasts of a chief on Oahu, located 8 miles east of Haleiwa in the mountains of Haupu" (McAllister 1933:137; Sterling and Summers 1978:107-112).
Pa‘ala‘a Kai	place	seaward Pa‘ala‘a (Pukui & Elbert 1986)	USGS 1953
Pa‘ala‘a Uka	place	seaward Pa‘ala‘a (Pukui & Elbert 1986)	USGS 1953
Paukauila	stream	the lightning ceases (Pukui et al. 1974)	Seaward portion of stream
Pohaku Lanai	stone		"Site 226. Pohaku Lanai, a large balancing stone on Kalaeoiupaoa Point. A large oval-shaped stone 18 feet across is balanced on a smaller base, standing about 10 feet high in all. This is said to have been used as a lookout by fishermen in the region. When fish were sighted, the stone was beaten with a wooden mallet, and the resulting hollow sound was sufficient to gather together the fishermen of the village." (McAllister 1933:140) "The Hawaiians say it was a stone which floated from Kahiki." (Sterling and Summers 1978:113)

Place Name	Type	Meaning	Comments
Punakai	residence		Site 224. “Punakai, Waialua. A kahuna named Puukane lived at this place, which was known as Punakai. Whenever Puukane chanted, the poi would overflow any vessel in which it had been placed. There is also said to have been an unu here by the name of Kukuiula" (McAllister 1933:140).
Punamoe	*loko* (pond)		LCA 7372:2
Pu‘upilo	heiau	hill [of the] swampy odor or pilo plant hill (Pukui et al. 1974)	"Site 227. Puupilo heiau, seaward of the Haleiwa Courthouse, Paalaa. A slight elevation of land with an old coconut palm on the side is all that remains of this heiau."

Appendix D Land Commission Awards in the Vicinity

No. 2907, Keawe, wahine, Waialua, January 5, 1848
N.R. 688v3

To the Land Commissioners, Greetings: I hereby state my claim at Ou, Kawailoa kai. This claim of mine was from Kaoo. There are nine lo`i and also a watercourse, and my house is on this land The boundaries are as follows: north, Kawelu's lo`is, east, Helumoa, south, Kalua-lepo, west, Kalualepo and the lo`is of Kahakai and of Kalua. I also have some lo`is and a pali wauke at Kawailoa waena, bounded as follows: north; a pali, east, Kuokoa, south, Lohi's /land/, west, Kaaeawa's /land/.

I desire to have an award document to protect these lands.
KEAWE X

F.T.519v11
No. 2907, Keawe Wahine

Ua hoohikiia o L. Kuokoa, Ua ike au elua apana aina aia m aka ili o Ou ma Kawailoa

Eha loi a me kahi kula
Mauka, Helumoa loi
Waianae, aina o Pueo
Makai, aina o Keliihuluhulu
Koolauloa, aina o Kawelu

Apana 2. Ainaiki moa moo 2 loi
Mauka, aina o Kahulupueo o Ou ka inoa
Waianae, aina o Pueo
Makai, aina o Koaiawa o Kaioulaula ka inoa
Koolauloa, kula o Kahakai

Ua loaa mai na makua mai a hooili mai ia ia ia Kamehameha I, aole mea keakea ia ia

Hoike 2. Kekahuna, Ua ike au e like me ko L. Kuokoa ike

F.T. 519v11
No. 2907 Keawe wahine /a woman/

L. Kuokoa sworn: I know of two apanas of land in the `ili of Ou, in Kawlailoa ahupua`a. There

are four lo`i and a kula.

Mauka, Helumoa lo`I
Waianae, land of Pueo
Makai, land of Keliihuluhulu
Koolaupoko, land of Kawelo.

Apana 2. Ainaiki mo`o, 2 lo`i.
Mauka, land of Kahulupue, named Ou
Waianae, land of Pueo
Makai, land of Kaaiawa, named Kaiaulaula
Koolaupoko, kula of Kahakai.

It was inherited from the parents in the time of Kamehameha I. No one has disputed her.

Witness 2. Kahuna, My knowledge of it is the same as L. Kuokoa's.

[Award 2907; R.P. 1460; Kawailoa Waialua; 1 ap.; 2 Acs; Keokea Kawailoa Waialua; 1 ap.; .52 Ac.; Ukoa Kawailoa Waialua; 1 ap.; .88 Ac.]

No. 7408, Kawahamana, Waialua, January 29, 1848
N.R. 327-328v5

A letter petitioning you, the Land Commissioners: I have a claim for land, from the time of Kahalau; my makuas had the land at that time. When Kahalau was finished on the land, it was transferred to Kekauwa, then my makuas were done occupying the land and it was transferred to me, until the present. Therefore I have the claim to this land at Kawailoa kai. It is bounded on the north and south by Kahakai's land, on the east by a house lot, on the west by Luahiwa's land.

Another claim is for one lo`i, from Kekauwa, therefore I desire to combine this lo`i with my land claim. It is bounded on the north by a weed-grown lo`i, on the east by a watercourse, on the south by Kalei's land, on the north by Kekauwa's land.
Therefore, I desire to have the Award Document from you,
KAWAHAMANA

F.T. 468v11
No. 7408, Kawahamana

Maaweiki, hoohikiia, Ua ike au i kona mau aina. Elua mau apana ma keia mau aina malalo nei, Kawailoa, Waialua, Oahu.

Apana 1. 1 loi moo Kapaula Ili o Koheo & pahale
Apana 2. 1 loi moo Kapaula Ili o Koheo.

Apana 1:
Mauka, loi o Helumoa
Waianae, Ili o Ou
Makai, aina o Kekaua
Koolaupoko, aina o Kahakai.

Apana 2:
Mauka, aina o Luahiwa
Waianae, aina o Kalei
Makai, aina o Kekauwa
Koolaupoko, aina o Kekauwa.

Mai na makua i ka wa o Kamehameha I. Aole mea keakea.

Nakahuahale, hoohikiia, Ua like ko maua ike me ko Maaweiki.

[Award 7408; R.P. 2642; Kawailoa Waialua, 2 ap.; .78 Ac.]

No. 9951, Laanui
N.R. 494-496v4

To the Honorable Land Commissioners: I, G. Laanui, am a claimant of land at Kawailoa, in Waialua on Oahu. Kawailoa is the name of my land, from the upland to the sea, from that side to this side, and two 'ili at Paalaa, and six 'ili at Kamananui. The names of the 'ili at Paalaa are Laukihaa and Waikaalulu, and at Kamananui they are Kalehunui, Kamahu, Kalaopa, Kamahu 2, Kamahu 3 and Kuanopill. These are my 'ilis in these Lands. Two lands, however, are mea kai /fisherles/, Kalaopa and Kalehunui. The origin of my right to the land in Waialua is from my wahine, Kuaipiia, and I have become a genuine kama'aina of this place, as though native-born of several generations of ancestors. When Kekuaipiia dwelt in Waialua, Ukoa was her original 'ili and at Kamananul she had the 'ili of Kalopa, she had the two. Kaahumanu asked Keeaumoku for Lokoea and Keeaumoku consented, and Piia gave me Ukoa and Lokoea and Kalopa in Kamananui. Keeaumoku died in 1824, and then Kaahumanu gave Waialua to Piia, from cape to cape, however, she truly controlled Kawailoa from the sea to the mountain and from this side to that side, yet, lt had no ku. Piia said to me, "Your land is Kawailoa, from the sea to the mountain, and from that side to this side; there is no ku within it"

The right was to be mine, and the two 'ili at Paalaa and the six 'ili at Kamananui, also, Ukoa and Lokoea are included within my Ahupua'a of Kawailoa. Thus said Piia to me. Kekuaipiia, my wahine who had settled me at Waialua, died in 1829, and Kaahumanu said to me, "Your wahine has died, and you are my kaikaina - you shall live in our house and my lands, which are yours from your wahine, shall be yours as in her bequest. Kaahumanu died in 1832, and Kinau said to me, "You return to Waialua to live - you shall be for me - you return as luna of the land you occupy - your lands from your wahines shall be yours." Thus said Kinau to me. Kinau died in 1839, and my lands have been held firmly from the three of them - two makuahine and one kaikamahine, and they are my right to the land and house lot, until this very time of Victoria Kamamalu, her kaikamahine - thus it has been, Therefore, I hereby request you, the Land Commissioners, to give me an award document for my lands and house lots.
G. LAANUI

F.T. 462-464v11
No. 9951, G. Laanui

L. Kuokoa, hoohikiia, Ua ike au i kona mau kuleana a pau ma keia mau ili of Waialua nei.

Apana 1. Ili o Kalaopa ma Kamananui.
Apana 2. Ili o Kalehunui.
Apana 3, Ili o Kamahu 1.
Apana 4, Ili o Kamahu 2.
Apana 5. Ili o Kamahu 3.
Apana 6. Ili o Kuanopili.
Apana 7. Ili o Laukihaa ma Paalaa.
Apana 8. Ili o Waikaalulu ma Paalaa.

Apana 9. Ahupuaa o Kawailoa.

Ua loaa mai keia mau kuleana ia ia maluna, mai a Piia, mai a Kaahumanu I, a mu Kinau, a e noho aku no malalo o Victoria Kamamalu. O kona mau kuleana ponoi maoli. Eia no.

Apana 1. Pahale a me ka loi 1.
Apana 2. 1 loi ma Kanenelu.
Apana 3. 1 loi, Kaaleo o Anahululuna.
Apana 4. Pahale o Poula ili o Koheo.
Apana 5. 1 loi o Kaluaokelea, Anahulu.
Apana 6. 1 loi o Kaoao ma Anahulu.
Apana 7. 2 loi o Kaluaakuawa, Kauhiwai ili.

Apana 1:
Mauka, loi koele, Kumukukui
Waianae, loi Kapiheakamalii
Makai, pahale o Hokuaulani
Koolaupoko, pa aina.

Apana 2:
Mauka, loi o Kahea
Waianae, alanui aupuni
Makai, loi koele, Keokea
Koolaupoko, loi o Kalauli.

Apana 3:
Mauka, Anahulu loi
Waianae, loi o Kahea
Makai, he mau loi, Kaipuakaiole
Koolaupoko, loi o Kuaipaihi.

Apana 4:
Mauka, loi o Helumoa
Waianae, Ili o Ou
Makai, loi o Koheoiki
Koolaupoko, pahale o Kalua.

Apana 5:
Mauka, loi o Kamahalo
Waianae, loi o Kuaipaihi
Makai, loi o Kuaipaihi
Koolaupoko, Muliwai o Anahulu.

Apana 6:
Mauka, loi o Kapuhi

Waianae, pahale o Puhi
Makai, Alanui aupuni
Koolaupoko, Muliwai o Anahulu.

Apana 7:
Mauka, moo o Hanakapuka
Waianae, Pali
Makai, 3 loi o Kahauhau
Koolaupoko, kahawai o Anahulu

Aole mea keakea i keia mau apana 7 mai a Piia mai a hiki i kona make ana. Mai kona make ana a hiki i anei. Ekolu malama.

F.T. 462-464v11 Translation
No. 9951, G. Laanui

L. Kuokoa, sworn, I know his entire claim in these 'ilis of Waialua.

Apana 1. 'Ili of Kalaopa in Kamananui.
Apana 2. 'Ili of Kalehunui.
Apana 3, 'Ili of Kamahu 1.
Apana 4, 'Ili of Kamahu 2.
Apana 5. 'Ili of Kamahu 3.
Apana 6. 'Ili of Kuanopili.
Apana 7. 'Ili of Laukihaa in Paalaa.
Apana 8. 'Ili of Waikaalulu in Paalaa.
Apana 9. Ahupua'a of Kawailoa.

He received these claims from Piia, from Kaahumanu I, and from Kinau, and is living under Victoria Kamamalu. These are his own genuine claims, as follows:

Apana 1. House lot and 1 lo'i.
Apana 2. 1 lo'i at Kanenelu.
Apana 3. 1 lo'i, Kaaleo, Anahululuna.
Apana 4. House lot of Poula, 'ili of Koheo.
Apana 5. 1 lo'i, Kaluaokelea, Anahulu.
Apana 6. 1 lo'i, Kaoao, at Anahulu.
Apana 7. 2 lo'i, Kaluaakuawa, Kauhiwai `ili.

Apana 1:
Mauka by lo'i ko'ele, Kumukukui
Waianae by lo'i Kapiheakamalii
Makai by House lot of Hokuaulani
Koolaupoko by Land boundary wall.

Apana 2:
Mauka lo'i of Kahea
Waianae by Government Road
Makai by lo'i ko'ele, Keokea
Koolaupoko by lo'i of Kalauli.

Apana 3:
Mauka by Anahulu lo'i
Waianae by lo'i of Kahea
Makai by some lo'is, Kaipuakaiole
Koolaupoko by lo'i of Kuaipaihi.

Apana 4:
Mauka by lo'i of Helumoa
Waianae by 'Ili of Ou
Makai by lo'i of Koheoiki
Koolaupoko by House lot of Kalua.

Apana 5:
Mauka by lo'i of Kamahalo
Waianae by lo'i of Kuaipaihi
Makai by lo'i of Kuaipaihi
Koolaupoko by Muliwai of Anahulu.

Apana 6:
Mauka by lo'i of Kapuhi
Waianae by house lot of Puhi
Makai by Government Road
Koolaupoko by Muliwai of Anahulu.

Apana 7:
Mauka by mo'o of Hanakapuka
Waianae by Pali, Makai by 3 lo'i of Kahauhau
Koolaupoko by Anahulu Stream.

These seven apana from Piia were undisputed until his death. From his death until now /it has been three months/.

[Award 9951; R.P. 6296; Kawailoa Waialua; 8 ap.; 8.0 A

Appendix E Archaeological Studies in Pa‘ala‘a Ahupua‘a and Hale‘iwa

Author(s)/ Date	Location	Nature of Work	Findings
McAllister 1933	Coastal Pa‘ala‘a kai	Island-wide survey	Identified 13 sites: 220 P~ Aikanaka Cannibal enclosure, 221 Laukiaha Spring; **222 Kumailia *Unu*;** 223 **Hekili Heiau**; 224 Punakai's house & **Kukuiula *Unu;*** 225 Kapukapuakea *Heiau*; 226 Pohaku Lanai; **227 Pu‘upilo *Heiau*; 228 Church cemetery and Kepuwai Heiau**; 229 Kawaipuolo Spring; **230 Mo‘o stone**, **231 Anahulu Heiau**; **232 Akua stone**
Beggerly (Martha Yent), 1977	Kaiaka State Recreation Area, coastal Pa‘ala‘akai	Surface Reconnaissance Survey & auger core testing	Coring results found no evidence of culture
Chiniago, Inc. 1979	Kamehameha Highway North of Anahulu Stream	Cultural Resource Survey	Identified 4 sites: Site 1439 (Historic Deposit), Site 1440 (Wall Remains), Site 1441 (Agricultural Terraces), and Site 1443 (an Old Church)
Yent, 1981	TMK 6-7-01:51 Across Kaiaka Bay from State Recreation Area, coastal Kamananui	Archaeological inspection	An eroding cultural deposit circa 1900 was noted
Mitchell, 1985	Pohaku Lanai, Kaiaka State Recreation Area, coastal Pa‘ala‘akai	Study of site 226 Pohaku Lanai	Mentions previous archaeological findings. Presents historical study. Site 50-Oa-D5-6

Author(s)/ Date	Location	Nature of Work	Findings
Frankhauser, 1987	TMK 6-4-04:3 Helemano Military Reservation *mauka* Pa‘ala‘akai	Reconnaissance survey with subsurface testing	Three minor historic sites were identified
Simons, 1988	TMK 6-6-17:29 McDonald's in Hale‘iwa, Pa‘ala‘a	Testing & Monitoring	1930 bottle in disturbed stratigraphy, comments on small rock shelters, Mango tree and walls in vicinity
Kirch and Sahlins 1992	Anahulu Valley	Anahulu Valley Research Project	Though no evidence of early occupation was found within mid or upper Anahulu Valley, Kirch suggests that because of the abundant marine resources at Waialua it is likely that initial Polynesian settlement of this area dates back to the developemental period
Moore, James R. *et al*. 1993	TMK 6-2-01:4,5,6 & 8 Hale‘iwa Beach Park Extension, Kawailoa	Archaeological Inventory Survey	Identified a historic house site, relocated site **235 - a stone said to have curative powers**. Sub-surface testing identified six burials, fire pits, post holes, midden and traditional and historic artifacts
Athens *et al.* 1995	‘Uko‘a Pond	Paleo-Environmental Research	Provides discussions on environmental changes for the past 8000 years as evidenced by pollen and diatom analysis, sediment accumulation rates, and charcoal particle counts
Mitchell, Rudy, 1995	Kapukapu-akea *Heiau* Kaiaka State Recreation Area, coastal Pa‘ala‘akai	Discussion of Site 225, Kapukapuakea *Heiau*	Nothing remains of the *heiau*. Large rock remains
Borthwick *et. al.* 1998	TMK 6-1-4:23, 58 and 6-2-1:1,10, Kawailoa	Archaeological Inventory Survey	World War II-era Structures and Bunkers, an Historic Trash Dump, a Buried Cultural Level, and one Pre-Contact Hawaiian Burial

Author(s)/ Date	Location	Nature of Work	Findings
Dagher, Cathleen 1999	TMK 6-6-12:002, Bishop Estate Lands in coastal Pa‘ala‘a kai	Inadvertent Isolated Human Skeletal Remains	Remains of one individual were identified in an imported sand pile - origin unclear
McGerty and Spear 2000	TMK 6-2-3:6 and 9, South of Loko‘ea Pond	Archaeological Inventory Survey	Identified 2 sites: Site 50-80-04-5795 (Charcoal Deposits), and Site 50-80-04-5839 (Stacked Basalat Boulder Wall)
McDermott et al. 2001	TMK 6-6-02: por. 01	Archaeological Inventory Survey of Hale‘iwa Ali‘i Beach Park	Identified 2 sites: Site 50-80-04-5791: the right-of-way for the former O.R. and L. railroad, Site 50-80-04-5850; subsurface cultural layer and burial
Hammatt and Shideler 2001	TMK 6-6-02: por. 01	Burial Treatment and Preservation Plan for Site 50-80-04-5850 at Hale‘iwa Ali‘i Beach Park	Site 50-80-04-5850; subsurface cultural layer and burial
Borthwick et al. 2002	TMK 6-2-3:17, 19, 20, 22 and 38, North Shore Skateboard Park, Kawailoa	Archaeological Inventory Survey	3 Sites identified including a segment of the O.R.&L. railroad right of way, a basalt boulder structure, and a subsurface cultural layer
Borthwick et al. 2003	TMK 6-2-1:por. 02, Hale‘iwa Beach Park	Archaeological Inventory Survey	No evidence of burials or subsurface cultural layers
Tulchin et al. 2003	Hale‘iwa Ali‘i Beach Park TMK 6-6-02: por. 01	Archaeological Assessment	No surface historic properties observed
Terry et al. 2004	TMK 6-6-16:16	Archaeological Inventory Survey	One historic trash pit: SIHP # 50-80-04-6693
Garrett, Carney and Hammatt 2007	For the Hale‘iwa Water Main Replacement, Portions of TMKs: (1) 6-02-005, 6-06-004, 6-06-009 & 6-06-010]	Archaeological Monitoring Report	No significant finds

Author(s)/ Date	Location	Nature of Work	Findings
Groza, and Hammatt 2008	for the Hale‘iwa Road Water System Improvements TMK: [1] 6-6-002: 2, 5, 6, 8, 12-15, 20, 21, 31	Archaeological Monitoring Report	Identified SIHP 50-80-04-7033, pre-contact subsurface cultural layer within the A-Horizon containing three pit features, marine shell fragments, coral, and some charcoal.

Appendix F Authorization and Release Form

Cultural Surveys Hawai‘i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

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

Job code:PAALAA2 hmcmillen@culturalsurveys.com mcorrea@culturalsurveys.com www.culturalsurveys.com

AUTHORIZATION AND RELEASE FORM

Cultural Surveys Hawai‘i (CSH) appreciates the generosity of the *kūpuna* and *kama‘āina* who are sharing their knowledge of cultural and historic properties, and experiences of past and present cultural practices for the Cultural Impact Assessment for the *ahupua‘a* of Pa‘ala‘a.

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 records.
4. You will be given a copy of this release form for your records.
5. You will be given any photographs taken of you during the interview.

For your 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 agree that the interview shall be made available to the public.
3. If a photograph is taken during the interview, you consent to the photograph being included in any report/s or publication/s generated by this cultural study.
4. If you have been interviewed previously by CHS, you consent for that interview to also be used for this report.

I, _____, agree to the procedures outlined above and, by my
(Please print your name here)
signature, give my consent and release for this interview to be used as specified.

_____
(Signature)

_____
(Date)

Community Consultation Letter

Cultural Surveys Hawai‘i, Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

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

Job code: PAALAA 2 hmcmillen@culturalsurveys.com mcorrea@culturalsurveys.com www.culturalsurveys.com

November 22, 2010

Aloha,

At the request of Group 70 International, Inc., Cultural Surveys Hawai‘i (CSH) is conducting a Cultural Impact Assessment (CIA) for the redevelopment of some of Kamehameha Schools’commercial properties located in Hale‘iwa. The 4.22-acre Project area is located in Pa‘ala‘a Ahupua‘a, Waialua District, O‘ahu Island ([1] 6-6-004:013, 14, 15, 16, 17, 18, 19, 27, 28, and 32).

Kamehameha Schools (KS) is proposing to redevelop its commercial properties located in Haleʻiwa along Kamehameha Highway from Mahaulu Lane to Kewalo Lane. These properties include the popular Matsumoto Shave Ice business. The Project site is bordered by retail stores to the north, Kamehameha Highway to the east, Hale‘iwa Town Center to the south, and agricultural lands to the west. The neighborhoods surrounding the project site consist primarily of low-rise residential and low-rise commercial uses.

The frontage of the project is currently zoned Residential District (R-5). This zoning reflects historic land use of storeowners who lived on the site. However, the residential zoning is nonconforming with the current and proposed commercial uses. The proposed action, therefore, involves consolidation and subdivision of parcels and change of zone to allow conforming uses. Parcels fronting Kamehameha Highway will require zone change from Urban Residential District (R-5) to Community Business District (B-2) and Neighborhood Business District (B-1) to Community Business District (B-2). Parcels located behind the commercial frontage will require zone change from General Agricultural District (AG-2) to Country District to allow parking uses.

The intent of this redevelopment Project is to revitalize existing businesses and provide essential infrastructure, while retaining the rural scale and plantation character of the Hale‘iwa Special District. The redevelopment will expand existing retail frontage with a combination of new in-line storefronts and preservation or reconstruction of selected historic buildings. The Project will also increase pedestrian pathways and safety, provide a central gathering place, and improve traffic flow with a newly constructed rear parking lot. The existing properties support approximately 14,000 SF of Gross Leasable Area (GLA), while the final build-out of the proposed redevelopment will provide up to 30,000 SF of GLA.

The construction of the new buildings will provide an opportunity for pedestrian walkway and landscape improvements along the Kamehameha Highway storefronts. These improvements will create buffer between pedestrians and vehicles, offering a safe and pedestrian friendly environment while enhancing the historic scenic view along the highway. The new asphalted parking area behind the commercial storefront will have two access points off existing roadways, which include Mahaulu Lane and Hale‘iwa Town Center driveway.

The purpose of the CIA is to gather information about the Project area and its surroundings through research and interviews with individuals that are knowledgeable about this area in order to assess potential impacts to the cultural resources, cultural practices and beliefs identified as a result of the planned Project. We are seeking your *kōkua* (assistance) and guidance regarding the following aspects of our study:

- **General history and present and past land use of the Project area**

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

In advance, we appreciate your assistance in our research effort. If you have any information you would like to share, we invite you to contact Heather McMillen at hmcmillen@culturalsurveys.com and/or Mary-Lindsey Correa at mcorrea@culturalsurveys.com or by phone at (808) 262-9972.

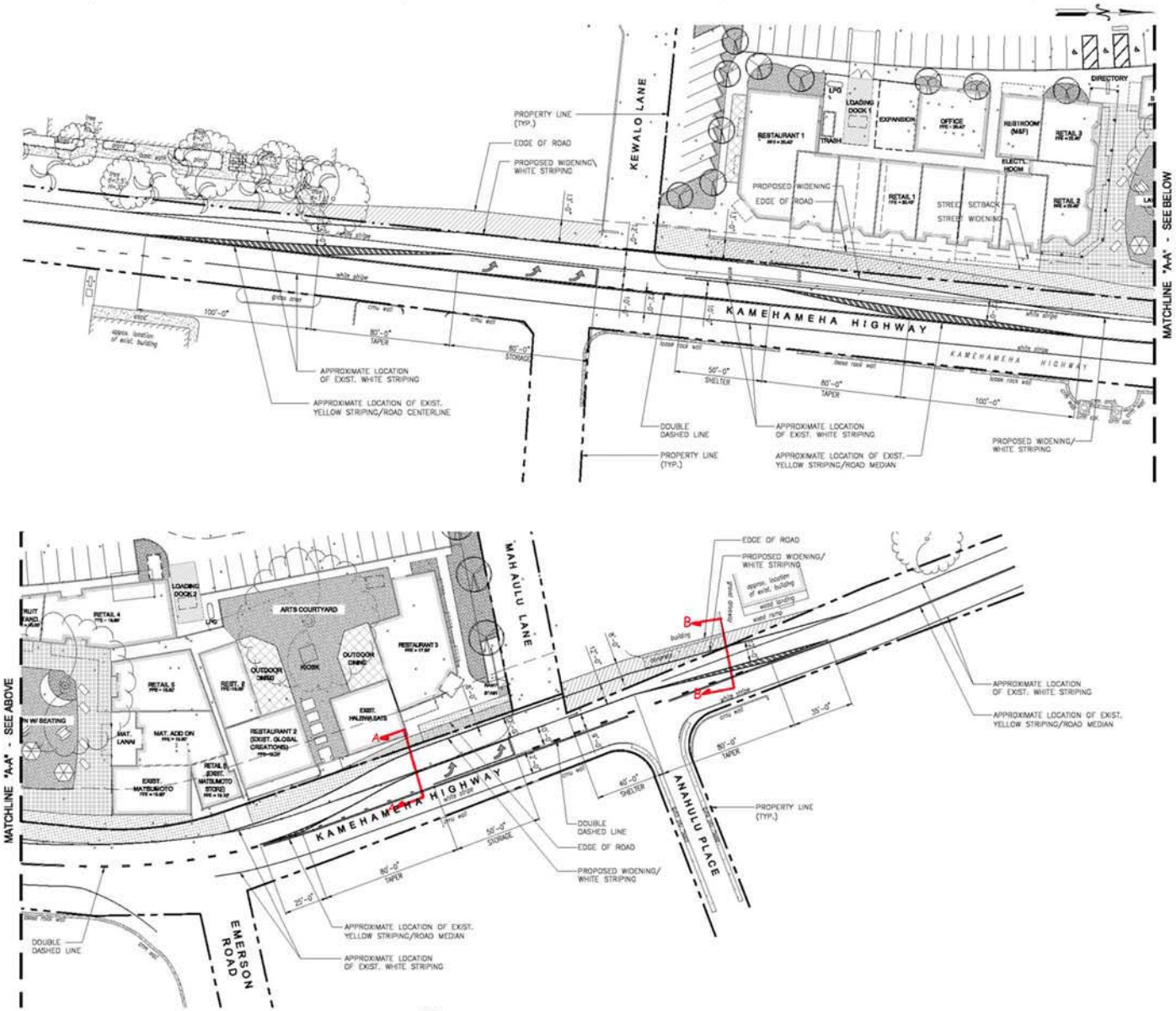
Mahalo nui,

Heather McMillen
CSH Cultural Researcher

Mary-Lindsey Correa
CSH Cultural Researcher

Appendix H

ROAD WIDENING IMPACTS TO HISTORIC STRUCTURES AND PEDESTRIAN SAFETY



1 PRELIMINARY ROAD MARKING PLAN (SCHEME 2)
SCALE: 1"=30'

GRAPHICAL SCALE
30' 0 30' 60' 90'
SCALE: 1"=30'

GROUP 70
INTERNATIONAL

Architecture Planning
Interior Design
Environmental Services

Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813-4307
Phone (808) 523-5866
Fax (808) 523-5874

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Supervision and Observation of this project is as defined in Section 13 of the Hawaii Administrative Rules Title 16, Chapter 115, Professional Engineers, Architects, Land Surveyors, and Landscape Architects.

04/09/12
Expiration Date of the License

REVISIONS

No./Date	Description

PROJECT TITLE

Hale'iwa Commercial Redevelopment

FILENAME:

DRAWING TITLE

PRELIMINARY
ROAD MARKING PLAN (SCHEME 2)

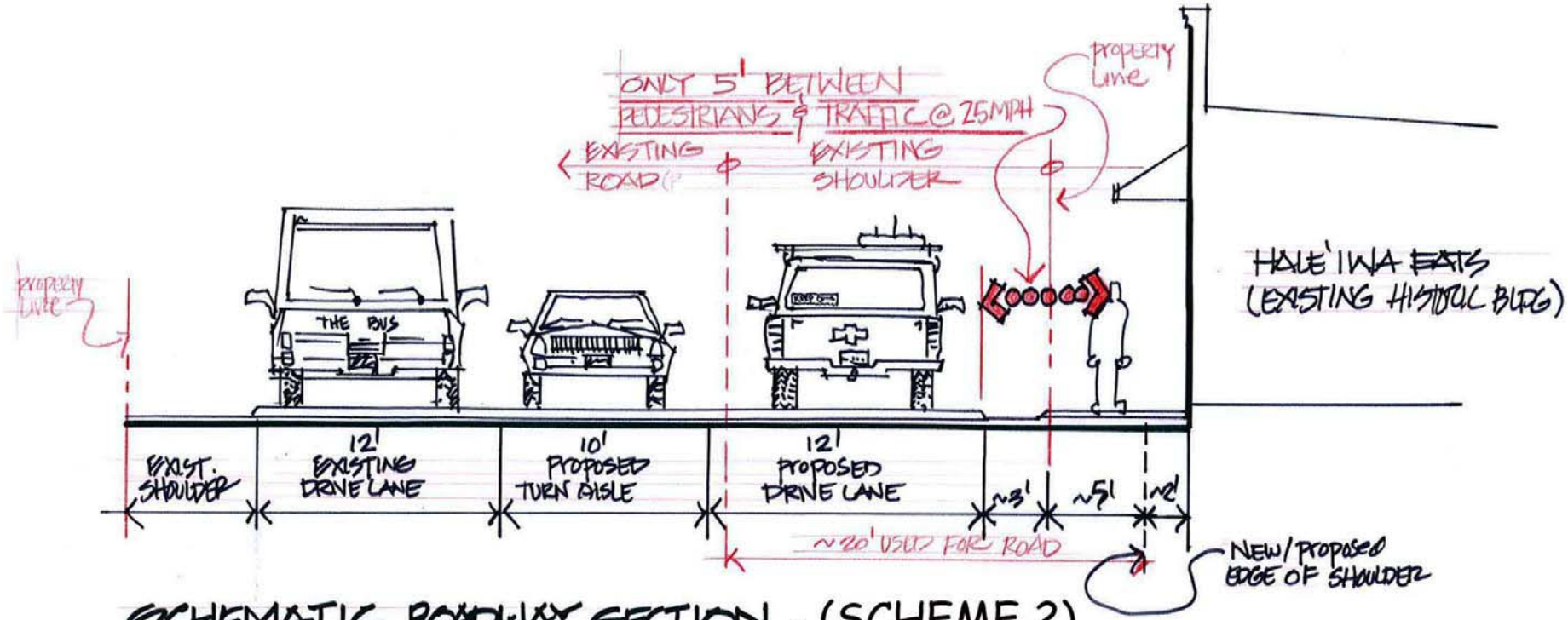
SCALE:

DRAWN BY: CHECKED BY:

PROJECT NO. DRAWING NO.

DATE:

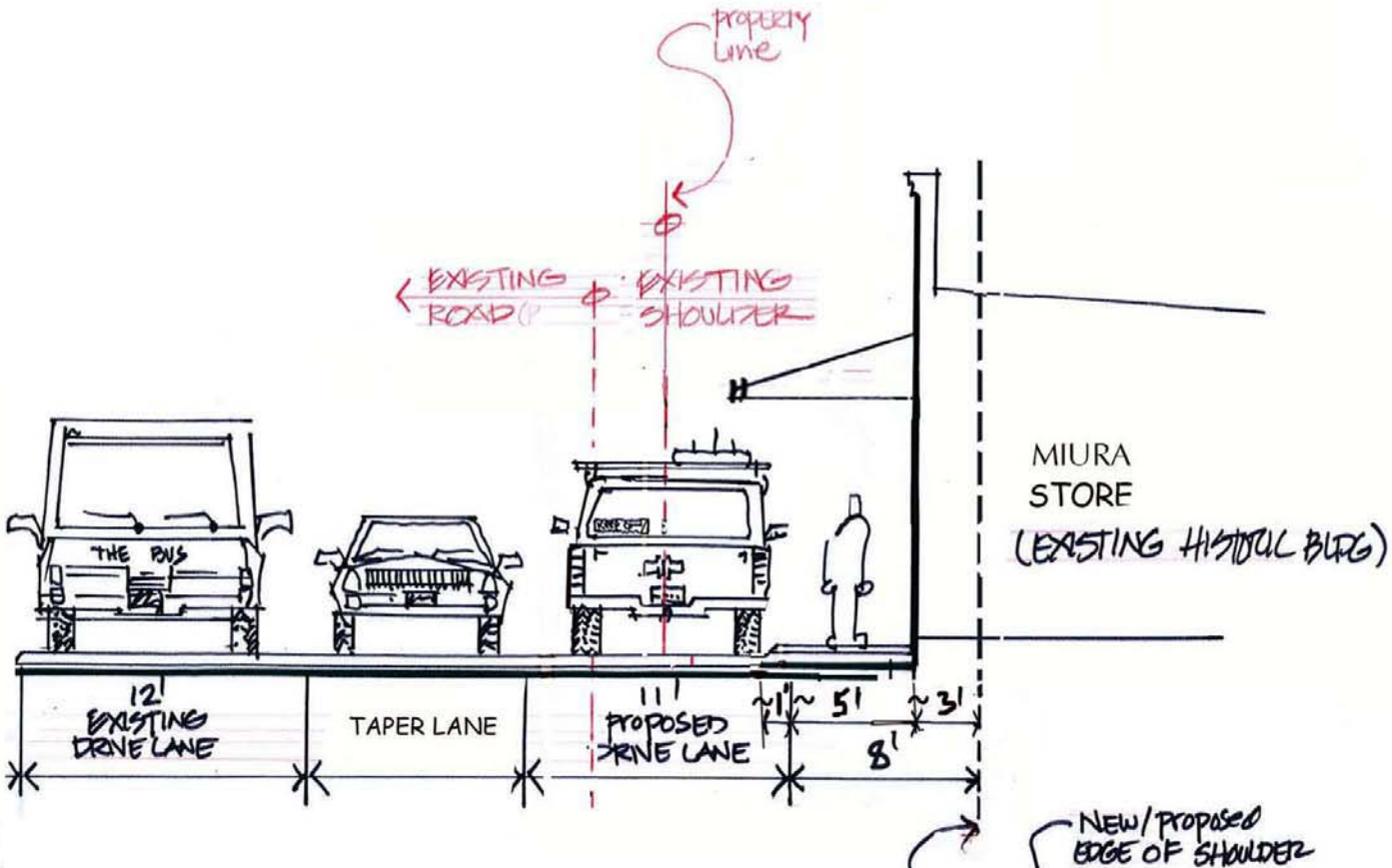
FIGURE 3-2



SCHEMATIC ROADWAY SECTION - (SCHEME 2)

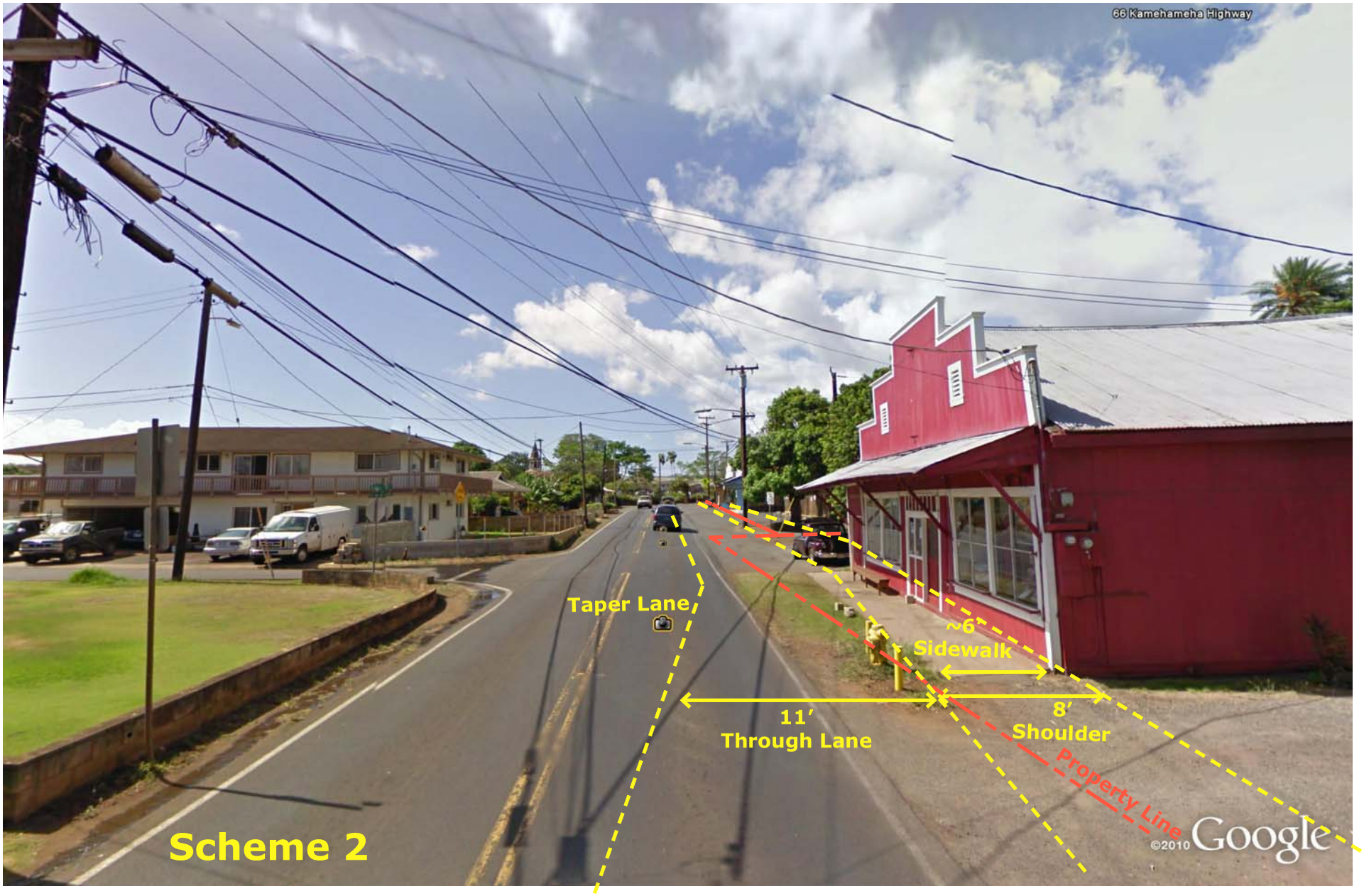
SECTION A-A

MIYOSHIDA
5' From Walkway
8' Shoulder
Property Line
12' Through Lane
10' Turn Lane
Scheme 2



SCHEMATIC ROADWAY SECTION - (SCHEME 2)

SECTION B-B


66 Kamehameha Highway
Taper Lane
~6'
Sidewalk
11'
Through Lane
8'
Shoulder
Property Line
©2010 Google
Scheme 2

Appendix I
COMMENT LETTERS AND RESPONSES

PRE-CONSULTATION COMMENTS AND RESPONSES

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

PETER B. CARLISLE, MAYOR

RANDALL Y. S. CHUNG, Chairman
ANTHONY R. GUERRERO, JR.
WILLIAM K. MAHOE
THERESIA C. McMURDO
ADAM C. WONG

GEORGE "KEOKI" MIYAMOTO, Ex-Officio
MICHAEL D. FORMBY, Ex-Officio

WAYNE M. HASHIRO, P.E.
Manager and Chief Engineer

DEAN A. NAKANO
Deputy Manager

November 29, 2010

RECEIVED
NOV 29 2010

Mr. Jeffrey H. Overton, AICP, LEED AP
Group 70 International, Incorporated
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Your Letter Dated November 12, 2010 on the Pre-Assessment Consultation Draft Environmental Assessment for Kamehameha Schools Haleiwa Commercial Redevelopment Project, TMK: 6-6-4:13, 14, 15, 16, 17, 18, 19, 27, 28, 32

Thank you for the opportunity to comment on the proposed redevelopment.

The existing water system is presently adequate to accommodate the proposed redevelopment. However, please be advised that this information is based upon current data and, therefore, the Board of Water Supply reserves the right to change any position or information stated herein up until the final approval of your building permit application. The final decision on the availability of water will be confirmed when the building permit application is submitted for approval.

When water is made available, the applicant will be required to pay our Water System Facilities Charges for resource development, transmission and daily storage.

The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

If you have any questions, please contact Robert Chun at 748-5443.

Very truly yours,

For PAUL S. KIKUCHI
Chief Financial Officer
Customer Care Division

GROUP 70 INTERNATIONAL

May 6, 2011

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
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Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
Ralph E. Portmore AICP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
George I. Atta AICP, LEED AP
Charles Y. Kaneshiro AIA, LEED AP
Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA

Mr. Paul S. Kikuchi, Chief Financial Officer
Board of Water Supply
630 South Beretania Street
Honolulu, HI 96843

Subject: **Pre-Consultation Comments for Draft Environmental Assessment Kamehameha Schools Haleiwa Commercial Redevelopment Project Haleiwa, O'ahu, Hawai'i TMK: (1) 6-6-004:013-19, 27-28, and 32**

Dear Mr. Kikuchi:

Thank you for your comment letter dated November 29, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

We acknowledge your comments that the existing water system is presently adequate to accommodate the proposed project, however, water availability will be confirmed when the building permit application is submitted for approval.

We will provide your office with a copy of the Draft EA for your review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

DEPARTMENT OF COMMUNITY SERVICES

CITY AND COUNTY OF HONOLULU

715 SOUTH KING STREET, SUITE 311 ● HONOLULU, HAWAII 96813 ● AREA CODE 808 ● PHONE: 768-7762 ● FAX: 768-7792

PETER B. CARLISLE
MAYOR

ERNEST Y. MARTIN
ACTING DIRECTOR

November 19, 2010

RECEIVED
NOV 22 2010
GROUP 70 INT'L

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Kamehameha Schools Hale'iwa Commercial Redevelopment Project
TMK (1) 6-6-004: 013, 14, 15, 16, 17, 18, 19, 27, 28, and 32
Waialua District, Island of O'ahu, Hawaii

We have received your letter dated November 12, 2010 regarding the subject project, and wish to thank you for providing the opportunity to comment on the proposal.

Our review of the material provided indicates that the proposed project will have no adverse impacts on any Department of Community Services' activities or projects in the area at this time. Thank you again for providing us this opportunity to comment on this matter.

Sincerely,

Ernest Y. Martin
Acting Director

EYM:sk

GROUP 70 INTERNATIONAL

PRINCIPALS

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Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA

May 6, 2011

Ernest Y. Martin, Acting Director
City and County of Honolulu Department of Community Services
715 South King Street, Suite 311
Honolulu, HI 96813

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Martin:

Thank you for your comment letter dated November 22, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

We acknowledge your comments that the proposed project is not anticipated to have adverse impacts on the department's activities or projects in the area at this time.

We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

DEPARTMENT OF FACILITY MAINTENANCE
CITY AND COUNTY OF HONOLULU
1000 Uluohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 768-3343 • Fax: (808) 768-3381
Website: www.honolulu.gov

PETER B. CARLISLE
MAYOR

GEORGE "KEOKI" MIYAMOTO
ACTING DIRECTOR

IN REPLY REFER TO:
DRM 10-905

November 30, 2010

RECEIVED
DEC - 2 2010
GROUP 70 INT'L

Mr. Jeffrey H. Overton, AICP, LEED AP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment (DEA)
Kamehameha Schools Haleiwa Commercial Redevelopment Project
TMK (1) 6-6-004:013, 14, 15, 16, 17, 18, 19, 27, 28 and 37
Waialua District, Island of Oahu, Hawaii

Thank you for the opportunity to review and comment on the pre-assessment consultation for the DEA for the proposed redevelopment of commercial properties owned by Kamehameha Schools in Haleiwa, Oahu.

The majority of the redevelopment will be within privately-owned property. However, any improvements within the roadway right-of-way of abutting City-owned Kamehameha Highway should be in accordance with City and County of Honolulu Standard Details as approved by the Department of Planning and Permitting.

Should you have any questions, please call Charles Pignataro of the Division of Road Maintenance, at 768-3697.

Sincerely,

George "Keoki" Miyamoto
Acting Director

GROUP 70
INTERNATIONAL

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Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA

May 6, 2011

George "Keoki" Miyamoto, Acting Director
City and County of Honolulu Department of Facility Maintenance
1000 Uluohia Street, Suite 215
Kapolei, HI 96707

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Miyamoto:

Thank you for your comment letter dated December 2, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments, improvements within the roadway right-of-way of abutting City-owned Kamehameha Highway will address the City and County of Honolulu Standard Details. We will work with the Department of Planning and Permitting or as regulated by the City Council as part of the Zone Change approval conditions.

We will provide your office with a copy of the Draft EA for your review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

PETER B. CARLISLE
MAYOR

DAVID K. TANOUE
DIRECTOR

ROBERT M. SUMITOMO
DEPUTY DIRECTOR

RECEIVED
FEB - 1 2011
GROUP 70 INT'L

2010/ELOG-2481 (TH)

January 27, 2011

Mr. Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment (DEA), Kamehameha Schools Haleiwa Commercial Redevelopment Project, TMK: (1) 6-6-004:013, 014, 015, 016, 017, 018, 019, 027, 028, and 032, Haleiwa, Oahu

We have reviewed the subject project and offer the following comments.

1. The DEA should discuss the proposed project's consistency with government plans and policies including the Hawaii State Plan, Chapter 205, Hawaii Revised Statutes (HRS), Chapter 343, HRS, Title 11, Chapter 200 Hawaii Administrative Rules (HAR), the City's General Plan, the current North Shore Sustainable Communities Plan (SCP), and draft revised North Shore SCP that was published in September 2010.

   The project site is within the "Haleiwa Country Town District" of the North Shore SCP, which supports commercial development. The North Shore SCP is currently being updated. Therefore, the DEA should address the project's consistency with policies and guidelines in the current and proposed North Shore SCP (August 2010) for the Haleiwa Country Town District. The DEA should also discuss the applicability of other policies and guidelines of the current and proposed North Shore SCP if applicable.

2. The Department of Planning and Permitting's (DPP) long-term land use policy is to maintain Haleiwa's "small town" character through policies in the North Shore SCP, the Land Use Ordinance (LUO), and the Haleiwa Special District (Section 21-9.90 of the LUO).

   The applicant proposes to rezone several small lots along Kamehameha Highway from R-5 Residential District and B-1 Neighborhood Business District to B-2 Community Business District. B-2 zoning is primarily intended for urban and urban-fringe commercial districts and for areas with adequate infrastructure. Two of these lots are currently zoned B-1 Neighborhood Business District (TMK: 6-6-004:014 and 027 portion). Given the small lots involved, and that most other commercial lots along the

   commercial strip along Kamehameha Highway are zoned B-1, a more appropriate zoning for the proposed project, in a rural town center is B-1 Neighborhood Business District.

   Furthermore, B-1 and B-2 zoning are slightly different in their use and development controls. B-1 zoning has a standard 40-foot height limit and a Floor Area Ratio (FAR) of 1.0, which limits the total building area on the parcel to no more than the total lot area. However, under B-2 zoning, the maximum height limit is established through the zoning map. The maximum FAR varies between 2.5 and 3.5, depending on the size of the open space bonus earned. B-1 zoning also prohibits such uses as home improvement centers, self-storage facilities, automobile sales, night clubs, and taverns, which are permitted under B-2 zoning.

   As such, the DPP believes that the B-1 zoning is the more appropriate zoning for this mostly mixed-use area, because the development restrictions of B-1 are a better fit for the area. Additionally, B-1 zoning fits this spine area's existing pattern of business zoning, which except for the Haleiwa Town Center area south of the project site has only B-1 zoning. Therefore, the DEA should consider B-1 zoning as an alternative for B-2 zoning.

3. Kamehameha Highway has a road widening setback which ranges from 5 feet to 14 feet along the frontage of the subject parcels. As such, street frontage Improvements may be required in accordance with Article 21, Chapter 14 ROH.

   Due to the many businesses along Kamehameha Highway in Haleiwa, potential traffic impacts and pedestrian safety will be important considerations during the EA/EIS and zoning phases. Therefore, the EA should include a traffic study that emphasizes pedestrian safety. For more information, please contact our Traffic Review Branch at 768-8077.

4. The DEA should address storm water quality requirements in accordance with the prevailing requirement of the Rules Relating to Storm Drainage Standards, pending revisions to incorporate Low Impact Development (LID) methods of treating storm water runoff. For more information, please contact our Civil Engineering Branch at 768-8106.

5. The proposed project is not located within the municipal wastewater service area. Therefore, the DEA should address how wastewater service shall be provided.

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,

David K. Tanoue, Director
Department of Planning and Permitting

DKT:js
2010elog2481

GROUP 70
INTERNATIONAL

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Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA

May 6, 2011

David K. Tanoue, Director
City and County of Honolulu Department of Planning and Permitting
650 S. King Street, 7th Floor
Honolulu, HI 96813

Subject: **Pre-Consultation Comments for Draft Environmental Assessment (DEA)**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Tanoue:

Thank you for your comment letter dated January 27, 2011 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments

1. The DEA will discuss the project's consistency with government plans and policies including the Hawaii State Plan, Chapter 205, Hawaii Revised Statues (HRS), Chapter 343, HRS, Title 11, Chapter 200 Hawaii Administrative Rules (HAR), the City's General Plan, the current North Shore Sustainable Communities Plan (SCP), and recently adopted North Shore SCP that was published in September 2010.
2. The applicant agrees with your recommendation to rezone the commercial project parcels to B-1 Neighborhood Business District instead of B-2 Community Business District.
3. The applicant is working closely with the City and County of Honolulu Traffic Review Branch in regards to satisfying the street frontage improvements requirement in accordance with Article 21, Chapter 14 ROH. Increasing pedestrian safety is one of the main goals for the proposed commercial redevelopment. Pedestrian safety issues will be discussed in the DEA.
4. The DEA will discuss incorporation of Low Impact Development (LID) methods of treating storm water runoff.
5. A new onsite wastewater treatment and disposal system will be constructed as part of the proposed development. The system will be designed to the State Department of Health standards.

We will provide your office with a copy of the Draft EA. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 768-4730 • Internet: www.honolulu.gov

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PETER B. CARLISLE
MAYOR

WAYNE Y. YOSHIOKA
ACTING DIRECTOR

SHARON ANN THOM
DEPUTY DIRECTOR

KENNETH TORU HAMAYASU, P.E.
SECOND DEPUTY DIRECTOR

TP11/10-391851R
TP11/10-392030R

November 30, 2010

Mr. Jeffrey H. Overton, AICP, LEED AP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment (DEA); Kamehameha Schools Haleiwa Commercial Redevelopment Project; Tax Map Key (TMK): (1) 6-6-004:013, 14, 15, 16, 17, 18, 19, 27, 28, and 32; Waialua District, Oahu, Hawaii

This responds to your letters of November 12, 2010, to the Mayor and myself, requesting our comments concerning this proposed project.

Our Traffic Engineering Division (TED) has the following comment:

- The DEA should conduct a Traffic Impact Assessment Report (TIAR). The TIAR should discuss traffic and parking impacts of the project and proposed mitigative measures.

- Short-term traffic impacts and mitigation during construction should also be discussed. Should any proposed construction activities require the temporary closure of a traffic lane, parking, etc., on a local street, a street usage permit from DTS will be required.

Our Public Transit Division (PTD) has the following comments:

- The DEA should include a description of Public Transit that services the area and the impact of your project on our Public Transit system operations during construction and after completion. Basic information is available on our websites: www.thebus.org and www.honolulu.gov/dts. For more detail, you may contact our staff at 768-8370.

- Construction notes should include the following note concerning transit: "This project will affect bus routes, bus stops, and para-transit operations, therefore, the Contractor shall notify the Department of Transportation Services, Public Transit Division at 768-8396 and Oahu Transit Services, Inc. (bus operations: 848-4578 or 852-6016 and para-transit operations: 454-5041 or 454-5020) of the scope of work, location, proposed closure of any street, traffic lane, sidewalk, or bus stop and duration of project at least two weeks prior to construction."

We reserve any further comments pending the publication and review of the DEA.

Thank you for the opportunity to review this matter. Should you have any further questions, please contact Michael Murphy of my staff at 768-8359.

Very truly yours,

WAYNE Y. YOSHIOKA
Acting Director

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May 6, 2011

Wayne Y. Yoshioka, Director
City and County of Honolulu Department of Transportation Services
650 S. King Street, 3rd Floor
Honolulu, HI 96813

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Yoshioka:

Thank you for your comment letter dated November 30, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments

1. A Traffic Impact Assessment Report (TIAR) has been conducted for the proposed project. Traffic and parking impacts and mitigation measures will be discussed and evaluated in the Draft EA
2. Short-term traffic impacts and mitigation during construction will also be discussed in the Draft EA
3. A description of Public Transit and the impact of the project on Public Transit during construction and after completion will be included in the Draft EA
4. The recommended construction notes concerning transit will be included in the construction document

We will provide your office with a copy of the Draft. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

PETER B. CARLISLE
MAYOR

COLLINS D. LAM, P.E.
ACTING DIRECTOR

DEPUTY DIRECTOR

December 9, 2010

DEC 13 2010

Mr. Jeffrey H. Overton, AICP, LEED AP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813- 4307

Dear Mr. Overton:

Subject: Pre- Assessment Consultation for Draft Environmental Assessment Kamehameha Schools Haleiwa Commercial Redevelopment Project TMK: (1) 6-6-004:013, 14, 15,16,17,18,19,27,28 and 32

Thank you for inviting us to review the Draft Environmental Impact Statement. The Department of Design and Construction does not have any comments to offer at this time.

Should you have any questions, please contact me at 768-8471.

Very truly yours,

Collins D. Lam, P.E.
Acting Director

CL:pg(391886)

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Tom Young, MBA AIA

May 6, 2011

Collins D. Lam, P.E., Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Subject: Pre-Consultation Comments for Draft Environmental Assessment Kamehameha Schools Haleiwa Commercial Redevelopment Project Haleiwa, O'ahu, Hawai'i TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Lam:

Thank you for your comment letter dated December 9, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

We acknowledge that the Department of Design and Construction has no comments on the subject matter at this time.

Upon completion, we will be providing your office with a copy of the Draft EA for your review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

PETER B. CARLISLE
MAYOR

KENNETH G. SILVA
FIRE CHIEF

ROLLAND J. HARVEST
DEPUTY FIRE CHIEF

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GROUP 70 INT'L

November 22, 2010

Mr. Jeffrey Overton, AICP, LEED AP
Principal, Chief Environmental Planner
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Preassessment Consultation for Draft Environmental Assessment
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Tax Map Keys: 6-6-004: 013, 014, 015, 016, 017, 018, 019, 027, 028, and 32

In response to your letter of November 12, 2010, regarding the above-mentioned subject, the Honolulu Fire Department (HFD) reviewed the material provided and requires that the following be complied with:

1. Provide a fire apparatus access road for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction when any portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150 feet (45 720 mm) from a fire apparatus access road as measured by an approved route around the exterior of the building or facility. (1997 Uniform Fire Code, Section 902.2.1.)

2. Provide 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 hereafter constructed or moved into or within the county.

   On-site fire hydrants and mains capable of supplying the required fire flow shall be provided when any portion of the facility or building is in

excess of 150 feet (45 720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building. (1997 Uniform Fire Code, Section 903.2, as amended.)

3. Submit civil drawings to the HFD for review and approval.

Should you have any questions, please call Battalion Chief Socrates Bratakos of our Fire Prevention Bureau at 723-7151.

Sincerely,

KENNETH G. SILVA
Fire Chief

KGS/KM:bh

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Katherine M. MacNeil AIA, LEED AP

Tom Young, MBA AIA

May 6, 2011

Fire Chief Kenneth G. Silva
Honolulu Fire Department
636 South Street
Honolulu, HI 96813

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Chief Silva:

Thank you for your comment letter dated November 22, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments, the proposed project will comply with the applicable 1997 Uniform Fire Code and the City and County of Honolulu Building Ordinance. Civil drawings will be submitted to the Honolulu Fire Department for review and approval during building permitting period.

We will provide your office with a copy of the Draft EA for your review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

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POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

PETER B. CARLISLE
MAYOR

LOUIS M. KEALOHA
CHIEF

DELBERT T. TATSUYAMA
RANDAL K. MACADANGDANG
DEPUTY CHIEFS

OUR REFERENCE DMK-LKA

November 22, 2010

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Mr. Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

This is in response to your letter of November 12, 2010, requesting comments on a Pre-Assessment Consultation, Draft Environmental Assessment, for Kamehameha Schools in Haleiwa.

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

LOUIS M. KEALOHA
Chief of Police

By
DAVE M. KAJIHIRO
Assistant Chief of Police
Support Services Bureau

Serving and Protecting With Aloha

GROUP 70 INTERNATIONAL

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May 6, 2011

Louis M. Kealoha, Chief of Police
Honolulu Police Department
801 South Beretania Street
Honolulu, HI 96813

Subject: **Pre-Consultation Comments for Draft Environmental Assessment Kamehameha Schools Haleiwa Commercial Redevelopment Project Haleiwa, O'ahu, Hawai'i TMK: (1) 6-6-004:013-19, 27-28, and 32**

Dear Chief Kealoha:

Thank you for your comment letter dated November 22, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

We acknowledge your comments that after the construction period, the proposed project should not impact the facilities or operations of the Honolulu Police Department.

We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
2010-TA-0048

NOV 3 0 2010

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

Subject: Pre-Draft Environmental Assessment for the Haleiwa Commercial Redevelopment Project, Wailua District, Oahu

Dear Mr. Overton:

We received your letter on November 15, 2010, requesting input regarding the preparation of a Draft Environmental Assessment (DEA) for the redevelopment of commercial properties owned by Kamehameha Schools located in Haleiwa along Kamehameha Highway from Mahaulu Lane to Kewalo Lane. Our response is in accordance with the Endangered Species Act of 1973 (ESA) and the Migratory Bird Treaty Act (MBTA).

We have reviewed the information you provided as well as pertinent information from our files, including data compiled by the Hawaii Biodiversity and Mapping Program and the Hawaii GAP Program. Accordingly, the federally endangered Hawaiian coot (*Fulica alai*); Hawaiian duck (*Anas wyvilliana*); Hawaiian moorhen (*Gallinula chloropus sandvicensis*); Hawaiian stilt (*Himantopus mexicanus knudseni*); (collectively referred to as waterbirds) have been observed in wetland areas adjacent to your proposed project. The Hawaiian hoary bat (*Lasiurus cinereus semotus*) has also been observed in the vicinity, as has the MBTA-protected wedge-tailed shearwater (*Puffinus pacificus*).

The DEA should address any potential impacts to federally protected species. We have provided the following information to assist you in the development of your DEA:

- Given the project's proximity to a wetland, we recommend surveys be conducted by a qualified biologist to determine waterbird use of the nearby habitat. In addition, we have enclosed a list of Best Management Practices to help minimize project related siltation and sedimentation due to construction activities near a wetland.

- Hawaiian hoary bats roost in both exotic and native woody vegetation and leave their young unattended in "nursery" trees and shrubs when they forage. If trees or shrubs suitable for bat roosting are cleared during the bat breeding season (April to August)

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there is a risk that young bats could inadvertently be harmed or killed. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 4.6 meters (15 feet) tall should not be removed or trimmed during the bat birthing and pup rearing season (April 15 through August 15).

- Outdoor lighting, such as street lights, can adversely impact listed and migratory seabird species. Seabirds fly at night and are attracted to artificially-lighted areas which can result in disorientation and subsequent fallout due to exhaustion or collision with objects such as utility lines, guy wires, and towers that protrude above the vegetation layer. Once grounded, they are vulnerable to predators or often struck by vehicles along roadways. Any increase in the use of night-time lighting such as parking lot lights, particularly during each year's peak fallout period (September 15 through December 15), could result in additional seabird injury or mortality. Impacts to seabirds can be minimized by shielding outdoor lights associated with the project to the maximum extent possible, eliminating night-time construction, and providing all contractors and tenants with information about seabird fallout. All lights, including street lights, should be shielded so the bulb can only be seen from below and use the lowest wattage bulbs possible.

If you have any questions regarding this letter please contact Ian Bordenave, Fish and Wildlife Biologist (phone: 808-792-9400; fax: 808-792-9581). We hope this information assists you in your planning effort.

Sincerely,

for Loyal Mehrhoff
Field Supervisor

Enclosure

U.S. Fish and Wildlife Service
Recommended Standard Best Management Practices

The U.S. Fish and Wildlife Service recommends that the measures below be incorporated into projects to minimize the degradation of water quality and minimize the impacts to fish and wildlife resources.

1. Turbidity and siltation from project-related work shall be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.

2. Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.

3. Dredging and filling in the marine/aquatic environment shall be designed to avoid or minimize the loss special aquatic site habitat (beaches, coral reefs, wetlands, etc.) and the function of such habitat shall be replaced.

4. All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.

5. No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.) or on beach habitats.

6. All debris removed from the marine/aquatic environment shall be disposed of at an approved upland or ocean dumping site.

7. No contamination (trash or debris disposal, non-native species introductions, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities. This shall be accomplished by implementing a litter-control plan and developing a Hazard Analysis and Critical Control Point Plan (HACCP – see http://www.haccp-nrm.org/Wizard/default.asp) to prevent attraction and introduction of non-native species.

8. Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate the clean-up of accidental petroleum releases.

9. Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.

10. Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

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May 6, 2011

Loyal Mehrhoff, Field Supervisor
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, HI 96850

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Mehrhoff:

Thank you for your comment letter dated November 30, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

To address the concern of federally protected species due to the project's proximity to a wetland and the presence of Hawaiian hoary bats within the vicinity, a qualified biologist has conducted a survey of potential waterbird and Hawaiian hoary bats habitat within the project area. The findings are attached for your review.

Although, no hoary bats were found during the course of the survey, as a precautionary measure, woody plants greater than 4.6 meters tall will not be disturbed during the bat's breeding season (April through August).

To address the potential for seabird fall-out, the design of the facility lighting will utilize best practices for night lighting having full-cutoff dark night fixtures. All associated lighting will follow City and County of Honolulu lighting ordinance.

The Best Management Practices to help minimize the impacts of project sedimentation from construction activities near the wetland will also be incorporated.

We will provide your office with a copy of the Draft EA for your review. We appreciate your input and participation in the pre-consultation process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

LINDA LINGLE
GOVERNOR OF HAWAII

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GROUP 70 INT'L

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
DOH/CWB

12004PSW.10

December 1, 2010

Mr. Jeff Overton
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

SUBJECT: **Pre-Assessment Consultation for the Draft Environment Assessment**
Kamehameha Schools Hale'iwa Commercial Redevelopment Project
Waialua District, Island of Oahu, Hawaii
TMK: (1) 6-6-004: 013 through 019, 27, 28, and 32 (portions)

The Department of Health, Clean Water Branch (CWB), has reviewed the document received November 15, 2010 regarding the subject project and offers these comments. Please note that our review is based solely on the document for the subject project and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Anti-degradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

   a. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction

activities may be taking place at different times on different schedules under a larger common plan of development or sale. This includes areas used for a construction base yard and the storage of any construction related equipment, material, and waste products. An NPDES permit is required before the start of the construction activities.

   b. Hydrotesting water,

   c. Construction dewatering effluent.

   You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI forms may be picked up at our office or downloaded from our website at http://hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html

3. For other types of wastewater not listed in Item No. 2 above or wastewater discharging into Class 2 or Class AA waters, an NPDES individual permit will need to be obtained. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://hawaii.gov/health/environmental/water/cleanwater/forms/environmental/water/cleanwater/forms/indiv-index.html

4. Please call the Army corps of Engineers at (808) 438-9258 to determine which Department of the Army (DA) permit(s) shall be required for the subject project. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

5. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E. CHIEF
Clean Water Branch

SW:ml

c: DOH-EPO #I-3437 [via email only]

GROUP 70
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Christine Mendes Ruotola AICP, LEED AP
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Tom Young, MBA AIA

May 6, 2011

Alec Wong, P.E., Chief
Clean Water Branch
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Wong:

Thank you for your comment letter dated December 1, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments, the proposed project will comply with the Hawai'i Administrative Rules (HAR) Chapters 11-54 and 11-55. Nearest ocean waters off the project site are designated as Class A waters (Hale'iwa Small Boat Harbor). Therefore, a general National Pollution Discharge Elimination System (NPDES) permit for construction activities will be obtained from the State Department of Health. An individual NPDES permit will also be obtained for disposal of wastewater effluent into Class 2 State inland waters. We are working with the US Army Corps of Engineers to continue the determination that the Department of the Army (DA) permit is not required.

We will provide your office with a copy of the Draft EA for your review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

Neil Abercrombie
GOVERNOR OF HAWAII

Keith R. Ridley
Acting Director of Health

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

December 30, 2010

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

Dear Mr. Overton:

SUBJECT: PRE-ASSESSMENT CONSULTATION FOR DRAFT ENVIRONMENTAL ASSESSMENT, KAMEHAMEHA SCHOOLS HALE`IWA COMMERCIAL REDEVELOPMENT PROJECT
TMK: (1) 6-6-004:013-019, -027, -028 AND -032
WAIALUA DISTRICT, OAH`U, HAWAI`I

The Safe Drinking Water Branch has reviewed the Pre-Assessment Consultation Package for the Draft Environmental Assessment for the subject project and provides the following comments:

1. Please identify the source of drinking water for the subject project.

2. To assist in the preparation of the Draft Environmental Assessment, please review the SDWB's standard comments at the following website.
http://hawaii.gov/health/environmental/env-planning/landuse/SDWB-standardcomment.pdf

If there are any questions, please call Jennifer Nikaido at 586-4258.

Sincerely,

MICHAEL MIYAHIRA, P.E., ACTING CHIEF
Safe Drinking Water Branch
Environmental Management Division

JN:cb

GROUP 70 INTERNATIONAL

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May 6, 2011

Michael Miyahira, P.E., Acting Chief
Safe Drinking Water Branch
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Miyahira:

Thank you for your comment letter dated December 30, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments, Waialua Aquifer will be the source of drinking water for the project. An Underground Injection Control (UIC) permit will be obtained according to the Hawai`i Administrative Rules, Title 11, Chapter 11-23 for the proposed wastewater treatment system.

We will provide your office with a copy of the Draft EA for your review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

KEITH R. RIDLEY
ACTING DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File:

10-934A CAB

December 20, 2010

DEC 27 2010

Mr. Jeffrey H. Overton
AICP, LEED AP, Principal
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

SUBJECT: Draft Environmental Assessment for Kamehameha Schools Haleiwa Commercial Redevelopment Project

A significant potential for fugitive dust emissions exist during all phases of the construction. The proposed activities will occur in proximity to public areas and thoroughfares, thereby exacerbating potential dust problems.

We encourage the contractor to implement a dust control program as stated in the subject document and to comply with the provisions of the Hawaii Administrative Rules §11-60.1-33 on Fugitive Dust.

The dust control measures, some of which are mentioned in your document, include, but are not limited to, the following:

a) Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
b) Providing an adequate water source at the site prior to start-up of construction activities;
c) Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
d) Minimizing dust from shoulders and access roads;
e) Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
f) Controlling dust from debris being hauled away from the project site.

If you have any questions, please contact Mr. Barry Ching of the Clean Air Branch at 586-4200.

Sincerely,

WILFRED K. NAGAMINE
Manager, Clean Air Branch

BC:rg

GROUP 70
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Tom Young, MBA AIA

May 6, 2011

Wilfred K. Nagamine, Clean Air Branch Manager
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Nagamine:

Thank you for your comment letter dated December 27, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments, the dust control program during construction activities will be implemented in accordance with Hawaii Administrative Rules §11-60.1-33, "Fugitive Dust". The recommended dust control measures will be incorporated in the construction process.

A copy of the Draft EA will be submitted to your office for review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

Neil Abercrombie
GOVERNOR OF HAWAII

DEC 16 2010

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

Keith R. Ridley
Acting Director of Health

In reply, please refer to:
File:

PreAssmnt Kam Sch Haleiwa Re-Dev

December 13, 2010

Mr. Jeffrey H. Overton, AICP, LEED AP
Group 70 International
925 Bethel Street 5th Floor
Honolulu, Hawaii 96813-4307

Dear Mr. Overton:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment Kamehameha Schools Haleiwa Commercial Redevelopment Project
Mahaulu Lane to Kewalo Lane along Kamehameha Highway, Haleiwa 96712
TMK (1) 6-6-004: 013, 014, 015, 016, 017, 018, 019, 027, 028 and 032

Thank you for the opportunity to review the subject project for comments on the Pre-Assessment Consultation for Draft Environmental Assessment Kamehameha Schools Haleiwa Commercial Redevelopment Project. We have the following comments and information on the subject property:

The subject project is located in the critical wastewater disposal area as determined by the Oahu Wastewater Advisory Committee. It is also located in the Pass Zone. Domestic wastewater treatment and disposal have not been addressed in the document. Please be informed that the wastewater system designed for the subject project shall comply with the Department of Health's Administrative Rules, chapter 11-62, "Wastewater Systems."

Should you have any questions, please contact the Planning & Design Section of the Wastewater Branch at 586-4294 or fax to 586-4300.

Sincerely,

MARSHALL LUM, P.E., ACTING CHIEF
Wastewater Branch

LM:cle

c: DOH's Environmental Planning Office (EPO I-3437)
City & County of Honolulu, Dept. of Planning & Permitting

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May 6, 2011

Marshall Lum, P.E., Acting Chief
State of Hawaii Department of Health
P.O. Box 3378
Honolulu, HI 96801

Subject: Pre-Consultation Comments for Draft Environmental Assessment Kamehameha Schools Haleiwa Commercial Redevelopment Project Haleiwa, O'ahu, Hawai'i TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Lum:

Thank you for your comment letter dated December 13, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comments, the Draft EA will address the planned wastewater treatment and disposal system in compliance with the Department of Health's Administrative Rules, Chapter 11-62, "Wastewater Systems".

A copy of the Draft EA will be submitted to your office for review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

NEIL ABERCROMBIE
GOVERNOR

JEFFREY CHANG
ACTING DIRECTOR

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

IN REPLY REFER TO:
STP 8.0298

December 9, 2010

DEC 15 2010

Mr. Jeffrey H. Overton, AICP, LEED AP
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Overton:

Subject: Haleiwa Commercial Redevelopment Project
Pre-Assessment 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 the Kamehameha School is proposing to redevelop 4.22 acres of its properties in Haleiwa along Kamehameha Highway from Mahaulu Lane to Kewalo Lane. The intent of the Haleiwa Commercial Redevelopment Project is to revitalize existing businesses and provide essential infrastructure, while retaining the rural scale and plantation character of the Haleiwa Special District. A new parking area behind the commercial storefront will have two access points off existing roadways, which include Mahaulu Lane and Haleiwa Town Center Driveway.

DOT does not anticipate any significant adverse impacts to the state transportation facilities. However, the applicant should be informed that a permit to transport oversized and overweight equipment/loads within the State highway facilities is required from the DOT Highways Division.

DOT appreciates the opportunity to provide comments. If there are any questions, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,

JEFFREY CHANG
Acting Director of Transportation

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May 6, 2011

Jeffrey Chang, Acting Director of Transportation
State of Hawaii Department of Transportation
869 Punchbowl Street
Honolulu, HI 96813

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Chang:

Thank you for your comment letter dated December 15, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

We acknowledge your comments that the proposed project is not anticipated to have significant impacts to the state transportation facilities. A permit will be obtained from the DOT Highways Division for the transport of oversized equipment and materials on State highway facilities.

We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

LINDA LINGLE
Governor of Hawai'i

KATHERINE PUANA KEALOHA
Director

Telephone (808) 586-4185
Facsimile (808) 586-4186
Electronic Mail: oeqc@doh.hawaii.gov

STATE OF HAWAI'I
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Department of Health
235 South Beretania Street
Leiopapa A Kamehameha, Suite 702
Honolulu, Hawai'i 96813

RECEIVED
DEC - 2 2010
GROUP 70 INT'L

November 30, 2010

Jeffrey H. Overton
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawai'i 96813-4307

Subject: Pre-Assessment Consultation for Draft Environmental Assessment
Kamehameha Schools Hale'iwa Commercial Redevelopment Project
TMK (1) 6-6-004:013, 14, 15, 16, 17, 18, 19, 27, 28, and 32
Waialua District, Island of O'ahu, Hawai'i

Dear Mr. Overton:

Thank you for your letter on November 12, 2010. Your letter identified the trigger(s) of Chapter 343, Hawaii Revised Statutes, and the approving agency for the required environmental study.

Your letter states that you will be preparing a draft environmental assessment for the subject action on behalf of your client, Kamehameha Schools. Section 11-200-10, Hawaii Administrative Rules, requires that the environmental assessment shall contain, but not be limited to the following information:

A. Identification of applicant or proposing agency;
B. Identification of approving agency, if applicable;
C. Identification of agencies, citizen groups, and individuals consulted in making the assessment;
D. General description of the action's technical, economic, social, and environmental characteristics;
E. Summary description of the affected environment, including suitable and adequate regional, location and site maps such as Flood Insurance Rate Maps, Floodway Boundary Maps, or United States Geological Survey topographic maps;
F. Identification and summary of impacts and alternatives considered;
G. Proposed mitigation measures;
H. Agency determination or, for draft environmental assessments only, an anticipated determination;

I. Findings and reasons supporting the agency determination or anticipated determination;
J. Agencies to be consulted in the preparation of the EIS, if an EIS is to be prepared; List of all permits and approvals (State, federal, county) required; and
K. Written comments and responses to the comments under the early consultation provisions of sections 11-200-9(a)(1), 11-200-9(b)(1), or 11-200-15, and statutorily prescribed public review periods.

Once your environmental study is complete, please coordinate with the approving agency for determination of the proposed action and submittal requirements to the Office of Environmental Quality Control for publication on the Environmental Notice.

Please feel free to call me at (808) 586-4185 if you have further questions.

Sincerely,

Herman Tuiolosega
Planner

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Tom Young, MBA AIA

May 6, 2011

Herman Tuiolosega, Planner
State of Hawaii Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, HI 96813

Subject: **Pre-Consultation Comments for Draft Environmental Assessment**
Kamehameha Schools Haleiwa Commercial Redevelopment Project
Haleiwa, O'ahu, Hawai'i
TMK: (1) 6-6-004:013-19, 27-28, and 32

Dear Mr. Tuiolosega:

Thank you for your comment letter dated December 2, 2010 concerning the Draft EA for the Kamehameha Schools Commercial Redevelopment Project.

In response to your comment, the Draft Environmental Assessment contents will comply with Section 11-200-10, Hawaii administrative Rules.

A copy of the Draft EA will be submitted to your office for review. We appreciate your input and participation in the pre-consultation process.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Jeffrey H. Overton, AICP, LEED AP
Principal, Chief Environmental Planner

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PHONE (808) 594-1888

FAX (808) 594-1865

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

COPY

HRD010/5393

November 29, 2010

Jeffrey H. Overton, Principal/Chief Environmental Planner
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Re: **Pre- Draft Environmental Assessment Consultation**
Kamehameha Schools Hale'iwa Commercial Redevelopment Project
Hale'iwa, Waialua District, Island of O'ahu

Aloha e Jeffery Overton,

The Office of Hawaiian Affairs is in receipt of your November 12, 2010 request for comments ahead of a draft environmental assessment (DEA) for the proposed redevelopment of commercial properties owned by the Kamehameha Schools in Hale'iwa.

A "finding of no significant impact" determination is anticipated and the City and County of Honolulu-Department of Permitting and Planning (DPP) will be the accepting authority for the final environmental assessment. DPP "change in zone" approval to support current and proposed commercial uses and parking will be required. Infrastructure installation, landscaping improvements and construction of a pedestrian walkway may require the use of the public right of way along Kamehameha Highway. The demolition of certain buildings and the construction of new storefronts and the preservation or renovation of certain historic buildings to be used for commercial purposes is proposed. At final build-out, the project will increase the gross leasable area within the 4.22 acre redevelopment area from 14,000 square feet to 30,000 square feet.

OHA appreciates that Leadership in Energy and Environmental Design construction elements and the potential for incorporating renewable energy, recycled wastewater and energy efficient designs will be considered.

Many of the essential historical and cultural elements which provide Hale'iwa Town with a "sense of place" have been incorporated into the North Shore Sustainable Community Development Plan. OHA advocates that a comprehensive community outreach effort be conducted and that any thoughts or concerns shared with you are afforded appropriate consideration as redevelopment plans are being finalized.

Thank you for initiating consultation at this early stage and we look forward to reviewing to reviewing the DEA. Should you have any questions, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer