DRAFT ENVIRONMENTAL ASSESSMENT

FOR

MEYER RESIDENCE
SHORELINE IMPROVEMENT PROJECT

Kahaluʻu, Koʻolaupoko, Oʻahu

May 2009

PREPARED FOR OWNER:

Joseph Meyer
P.O. Box 1325
Kāneʻohe, Hawaiʻi 96744

PREPARED BY:

SSFM INTERNATIONAL
501 Sumner Street, Suite 620
Honolulu, Hawaiʻi 96817

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INTRODUCTION

1.1 PROJECT SUMMARY INFORMATION

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Applicant/Owner:	Mr. Joseph Meyer P.O. Box 1325 Kāneʻohe, HI 96744
Approving Agency:	City and County of Honolulu Department of Planning and Permitting (DPP) Land Use Approval Branch
Agent/ EA Preparation:	SSFM International 501 Sumner Street Honolulu, HI 96817 Contact: Mr. Jared Chang Phone: 531-1308
Project Description:	The project involves the construction of structures within the Shoreline Setback Area associated with residential use of the property.
Location:	The parcel is situated along Kāneʻohe Bay's shoreline at 47-83 Kamehameha Highway, Kahaluʻu, Oʻahu, Hawaiʻi. Figure 1.1 shows the projects general location.
Tax Map Key:	(1) 4-7-019: 082
Land Area:	0.6 acre
State Land Use Designation:	Urban
Koʻolaupoko Sustainable Communities Plan:	Low Density Residential and within Rural Community Boundary
Zoning:	R-10 Residential
Special Management Area:	Within SMA
40-Foot Shoreline Setback Area:	A copy of the certified shoreline map is included in Appendix F.
Lot Buildable Area	43,560 SF (0.34 acres)


AERIAL PHOTO
MAP KEY
Project Site
FIGURE 1.1
0 125 250 500 750 1,000 Feet
N
PROJECT SITE

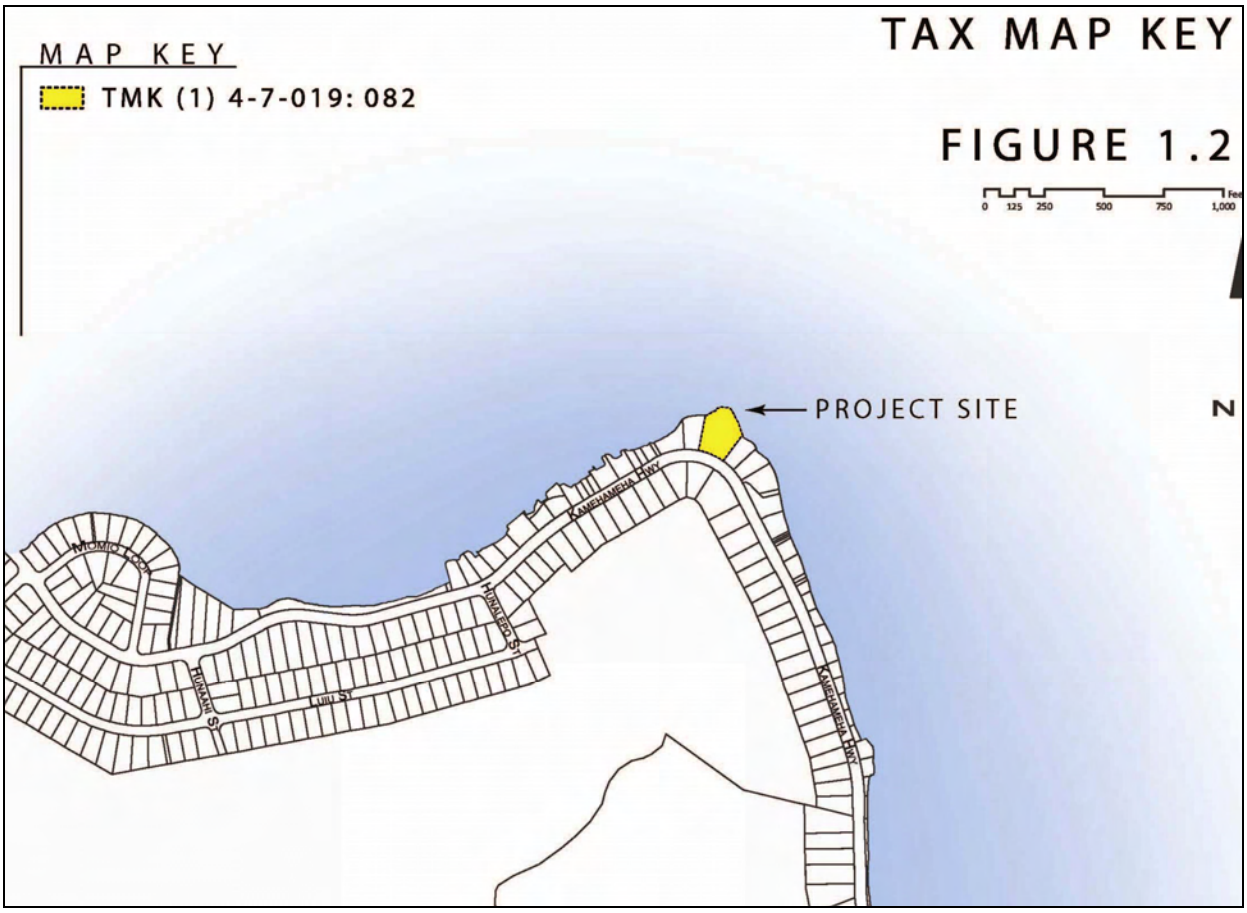
1.2 PURPOSE FOR ENVIRONMENTAL ASSESSMENT

This Draft Environmental Assessment (Draft EA) was prepared in conformance to the regulatory requirements prescribed under Chapter 343, Environmental Impact Statements, Hawai'i Revised Statutes (HRS), and Title 11, Chapter 200 (Environmental Impact Statement Rules) of the State Department of Health's Administrative Rules (HAR).

Actions which "trigger" the requirement for environmental review of a project are prescribed by State law. This project triggers the State environmental review process because it proposes a use within the City's shoreline setback area. Subsequently, the Final EA will be included with an Application for a Shoreline Setback Variance in accordance with the Revised Ordinances of Honolulu (ROH), Chapter 23, Shoreline Setbacks.

1.3 PROJECT LOCATION AND OWNER

The project is located at 47-83 Kamehameha Highway in the Kahalu'u community on the Island of O'ahu. The 0.6 acre property is owned by Joseph Meyer and identified as Tax Map Key (TMK) (1) 4-7-019: 082. Figure 1.2 below (🡻) shows the TMK boundaries for the site and surrounding parcels.



1.4 EXISTING LAND USE DESIGNATIONS

State Land Use District

Under Chapter 205, HRS, all lands in the State of Hawai'i are classified into four major land use districts (State Land Use Districts) which are Urban, Rural, Agricultural, and Conservation districts (State of Hawai'i, 2000). The project site is classified as "Urban District" on the State's Land Use District Boundary Map. Figure 1.3 shows the project area's State Land Use designation.

Jurisdiction over land uses and activities conducted within the O'ahu's State Urban District generally falls under the City and County of Honolulu. The coastal waters adjacent to the project are located within the Conservation District. A certified shoreline map has been completed for the property and all proposed improvements will be located mauka (landward) of the certified shoreline. Thus, there are no improvements or uses being proposed within the State Conservation District.

City and County Development/Sustainable Communities Plans

The City's Development or Sustainable Communities Plans (SCP), consists of conceptual schemes for implementing the development or sustainable objectives and policies of the City's General Plan. The project site is designated "Low Density Residential" on the Ko'olaupoko Sustainable Communities Plan's Urban Land Use Map (City, 2000). Surrounding areas immediately are also designated "Low Density Residential." The project site is also located within the plan's "Rural Community Boundary." These communities consist of smaller, more dispersed, less intensively developed residential communities and towns than those of Ko'olaupoko's urban fringe areas. Figure 1.4 shows the project site in relation to the plan's land use map.

City and County Zoning Districts

All lands within the City are categorized, or zoned, into specific districts. The uses permitted within these districts are described under the City's *Land Use Ordinance* (Chapter 21, ROH), and are shown on zoning maps. The purpose of the Land Use Ordinance is to regulate land use in a manner which encourages orderly development in accordance with adopted land use policies, to protect and promote public, health, and safety. The project site and surrounding properties are zoned R-10, Residential. This classification is intended to provide areas for large lot developments typically located at outskirts of urban development and where residential use is desirable. Figure 1.5 shows the zoning associated with the project site and surrounding areas.

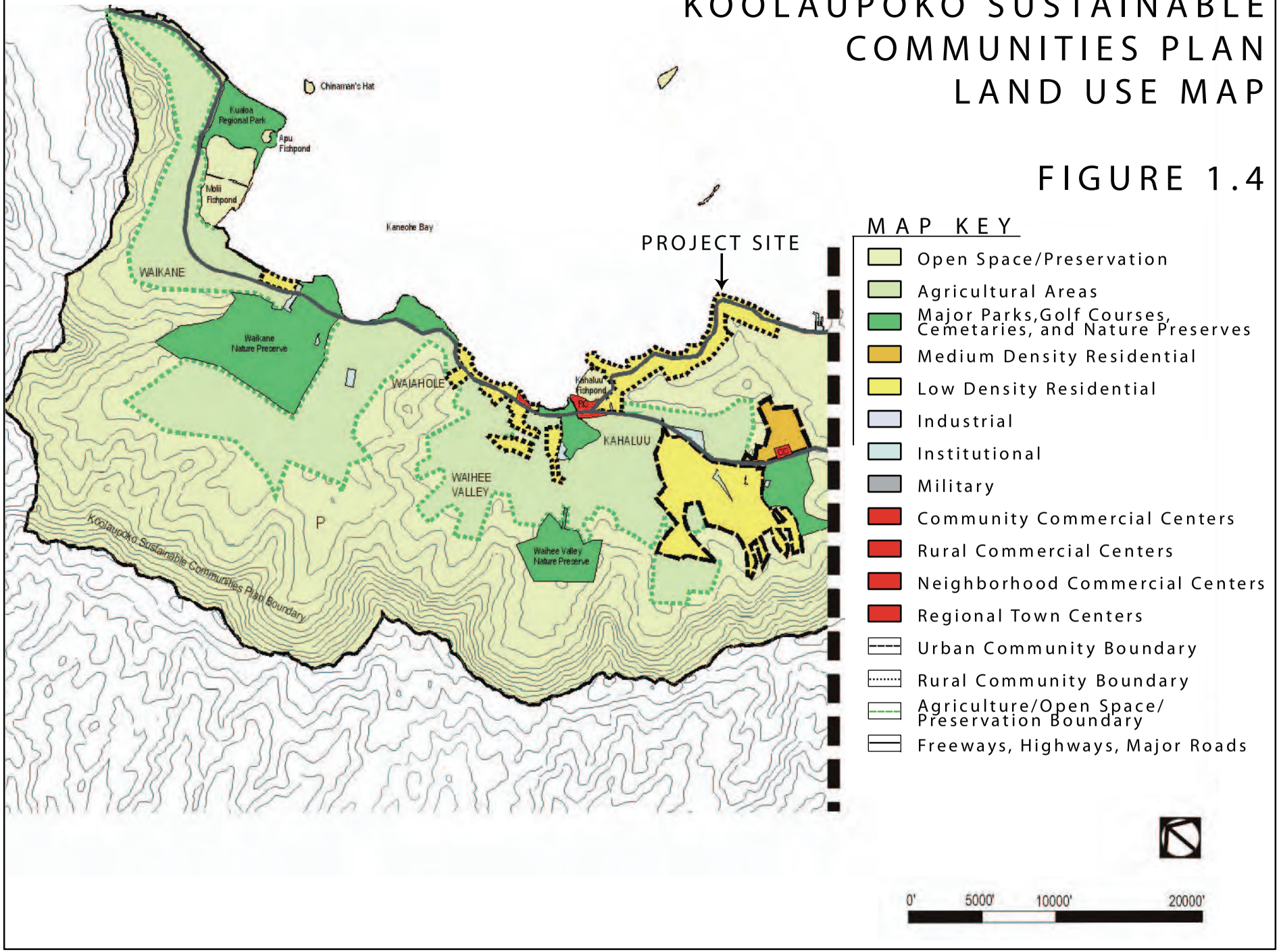
Special Management Area

Under Chapter 205a (Coastal Zone Management) of HRS, the City and County of Honolulu is given authorization to regulate land uses located within the established Special Management Area (SMA) for the Island of O'ahu. Figure 1.6 graphically presents the proposed project area in relation to the SMA boundaries. Review of the City's SMA Map determined that the entire project site is within the City's SMA. Therefore, project is subject to regulatory procedures, permit requirements, and review under the City's SMA regulations described in Chapter 245, ROH.

STATE LAND USE DISTRICTS

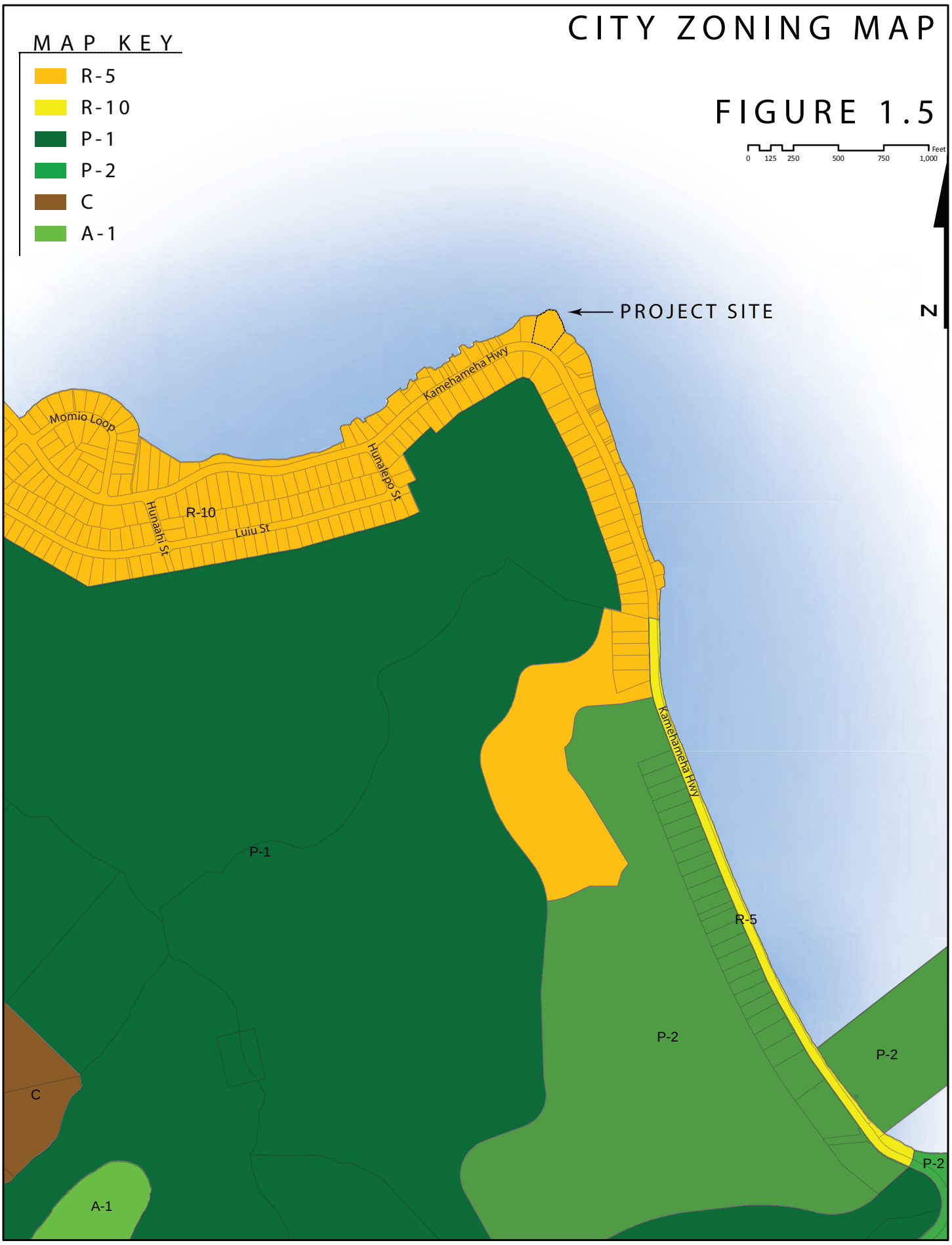
KOOLAUPOKO SUSTAINABLE COMMUNITIES PLAN LAND USE MAP

FIGURE 1.4

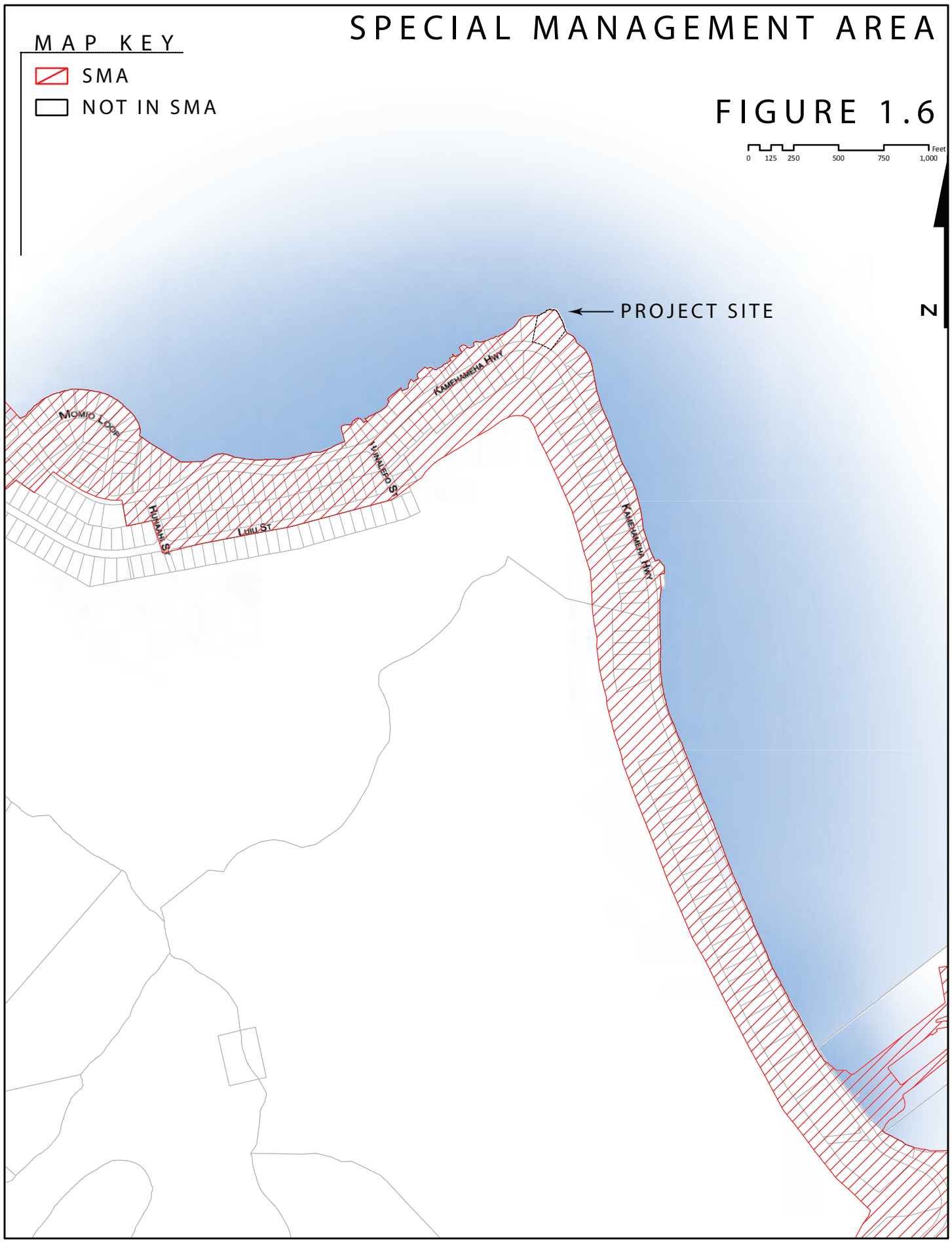


CITY ZONING MAP

FIGURE 1.5



SPECIAL MANAGEMENT AREA



1.5 EXISTING SURROUNDING LAND USES

This section describes the surrounding land uses and public facilities. Figure 1.7 shows the general vicinity of the project site.

He'eia Kea Small Boat Harbor

He'eia Kea Small Boat Harbor is located at 46-499 Kamehameha Highway about one mile southeast of the project site. This public facility is managed and operated by the State Department of Land and Natural Resources (DLNR), Division of Boating and Ocean Recreation (DOBOR). It has 21 boat slips, 54 moorings, 3 boat launching ramps, and a fish hoist, restrooms, and showers.

Kāne'ohe Bay is a sheltered body of water composed of a barrier reef with two navigable channels at its north and south ends. This is one of Hawai'i's most important marine resources supporting various commercial, recreational, and subsistence uses. Kāne'ohe Bay is classified as a Class AA marine resource defined by Title 11, Chapter 54 HAR. It is the State's objective that these waters remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions.

He'eia and Kahalu'u Fishponds

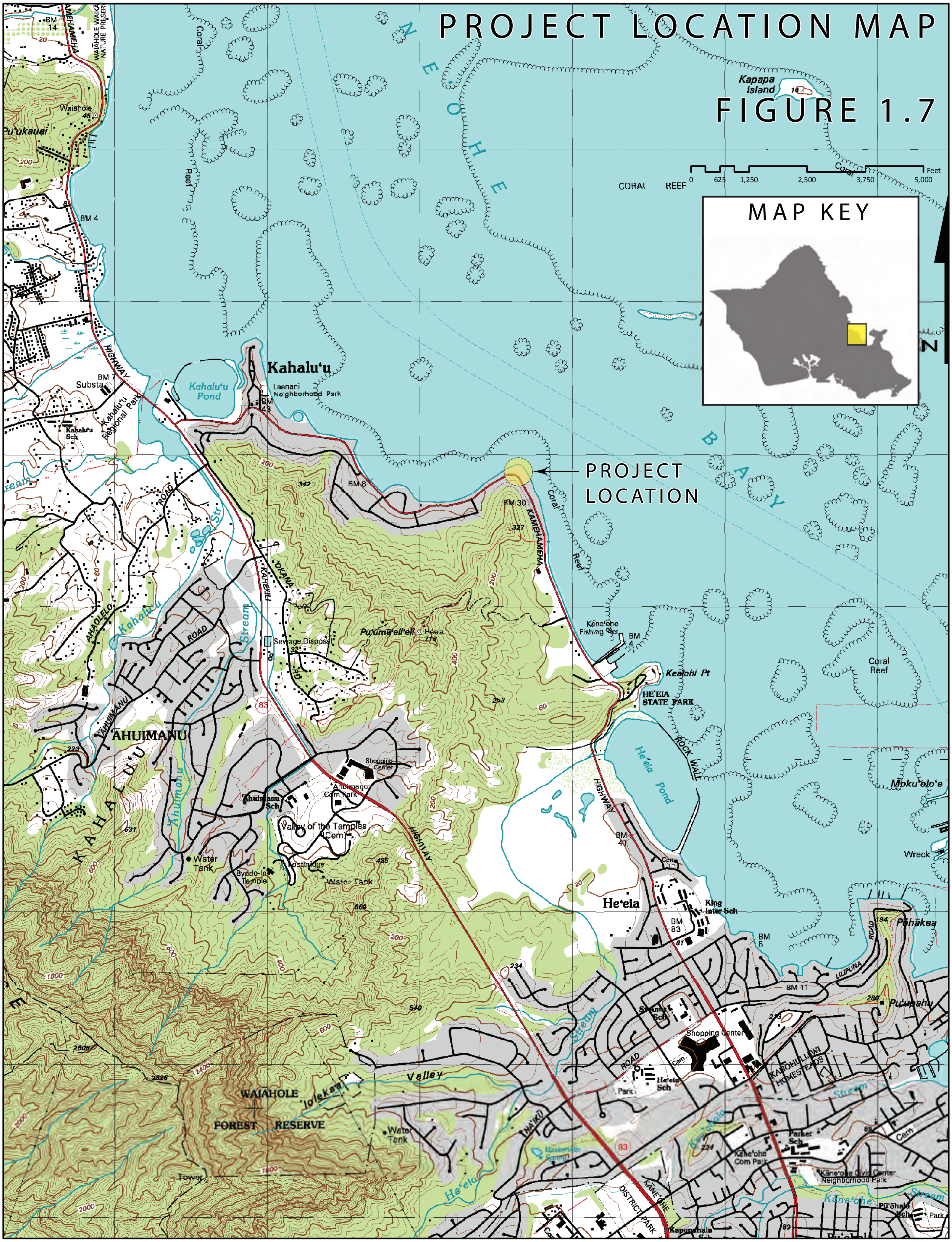
There are two fishponds located within the vicinity of the project site. They are He'eia Fishpond and Kahalu'u Fishpond. Each is historically and culturally significant and both are listed on National and State Registers of Historic Places.

He'eia fishpond is located approximately 1.5 miles southeast of the project site. This is an ancient fishpond originally established over 600 years ago by He'eia ahupuaa residents as a stocking pond to cultivate fish and provide easy access to fishing during winter months. He'eia fishpond is maintained and managed thru a partnership between Paepae o He'eia, a private non-profit organization, and the landowner, Kamehameha Schools.

Kahalu'u fishpond, also known as Kahouna fishpond, is located approximately 1.5 miles northwest of the project site. This fishpond was also used by ancient He'eia ahupuaa residents to trap and cultivate fish. There are currently two rental facilities located on the fishpond property, the Aloha Ke Akua Wedding Chapel and Pohai Ke Aloha Pavilion.

Adjacent Land Use Designations

As shown in the land use maps, the majority of immediately adjacent land uses are designated as residential. There are also State Conservation District lands abutting much of the residences on the mauka (inland) side of Kamehameha Highway. Marine areas makai (seaward) of the shoreline are also within the State Conservation District. As shown in the State and City land use designation maps, low-density residential uses are located adjacent to the mauka and makai sides Kamehameha Highway through this particular segment centered at the project site.


PROJECT LOCATION MAP
FIGURE 1.7
MAP KEY
PROJECT LOCATION
0 625 1,250 2,500 3,750 5,000 Feet
Kapapa Island
Kahalu'u
Kahalu'u Pond
Laenani Neighborhood Park
Kāne'ohe Fishing Pier
Kealohi Pt
HE'EIA STATE PARK
He'eia Pond
Moku'olo'e
ĀHUIMANU
Valley of the Temples (Cem)
Byodo-in Temple
He'eia
King Inter Sch
Pōhākea
Pu'uohahu
WAIAHOLE FOREST RESERVE
Coral Reef
BAY

CHAPTER 2
PROJECT DESCRIPTION

2.1 PROJECT BACKGROUND

The applicant will construct a new single-family dwelling at 13-13 Kamehameha Highway along the coastline bordering Kāne'ohe Bay. The home's design is being prepared in conformance with the requirements for single-family residences in the R-10 zoning designation for the City and County of Honolulu. The entire dwelling footprint will be situated in accordance with R-10 zoning setback requirements and height restrictions.

Construction of the single-family dwelling is being delayed pending the approval of proposed improvements within the Shoreline Setback Area. The construction of these shoreline improvements, if approved, would need to occur before construction of the house because of access restrictions. The preferred construction methods for the shoreline improvements would require access and staging areas to be located on-site and outside of the shoreline setback area. This method is not possible with the house erected. The use of any Conservation District lands for construction staging or site access was dismissed due to the potential for adverse impacts to applicable marine and coastal resources.

Low –density residential use of the property has remained unchanged for at least 30 years as shown in a comparison of aerial photos taken in 1975 and 2005 (🡻). A photograph from 1975 shows a home that was once located on the parcel. This home has since been demolished and removed by the previous owner. However, three (3) broken concrete sections of debris associated with previous home remain on the property. A section of the concrete debris is located within the property's Shoreline Setback and should be properly removed. These broken structures consist of the building footing, a portion of stairs and some low hollow-tile walls.

Photo taken in 1975

Photo taken in 2005

2.2 EXISTING SHORELINE CONDITIONS

A Coastal Engineers Report was prepared for the project by Sea Engineering, Inc and is included in Appendix C of this document. The function of this coastal engineering evaluation was to conduct site visits to document and measure shoreline profiles, describing the coastal setting, evaluating coastal hazards, describing the shoreline and shoreline processes, and performing historical erosion analysis. A discussion of the evaluation's findings are presented below.

Shoreline Type

The shoreline consists of a narrow, 15 to 30 foot wide, beach composed of rock, cobbles, compact sediment, and silty sand. The shoreline is fronted by a 500 to 800 foot wide reef flat which varies in depth from 1 to 3 feet. The reef flat is covered with silty sand, sand, seaweed, coral, and coral rubble. A steep earthen bank abuts the shoreline at the project site. The west end of the property consists of a steep bank which varies from near vertical to overhanging. The mid-section of this property is an exposed point with an exposed basalt bench. The east end of the property is an exposed dirt bank sloping to the cobble beach. The property's bank slope varies from vertical to 45-degree slopes (1H:1V). Due to the undercutting of the west end, unsafe conditions exist and the risk of slope failure is high.

Historical Shoreline Analysis

Photographs from 1975 and 2005 were utilized for the purpose of analyzing shoreline erosion. The image from 1975 was digitally overlaid and scaled over the 2005 image allowing Sea Engineering to visually analyze erosion impacts over a 30-year horizon. No significant difference in the overhanging vegetation line was noted, indicating that significant recession of the vegetation line has not occurred. However, the site visit revealed some evidence of shoreline erosion, including segments of bare earthen bank, some sections where the bank was undercut, turbid brown water nearshore, and toppled shrubs.

Sediment Movement

Kāneʻohe Bay is a reef sheltered lagoon with a total bay front exposure of 4.6 miles between Kualoa Point to the northwest and Mōkapu Peninsula on the southeast. This opening is mostly reef with only two navigable channels, which limits the wave energy entering the bay. During the site visit, there was little evidence of sand transport. Rock outcrops and seawalls bound the property on either side.

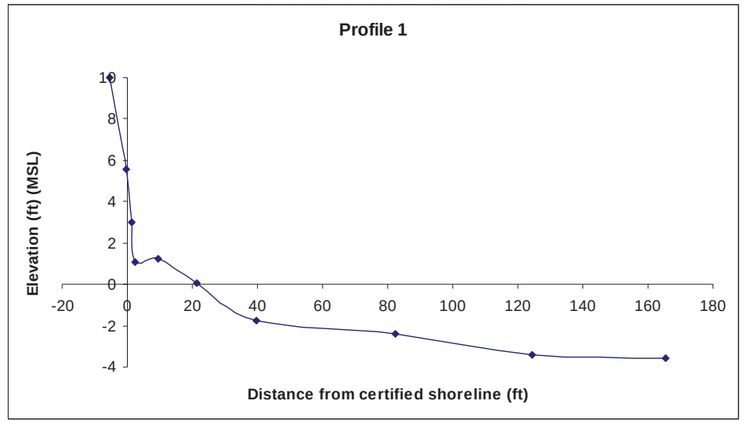
Beach Profiles

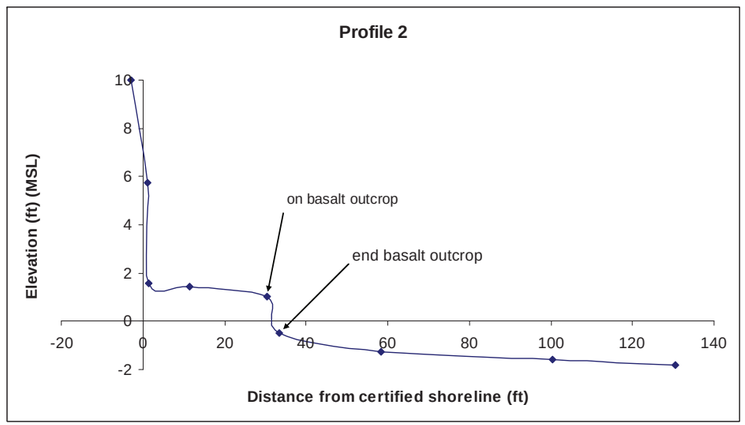
Beach profiles were prepared that extend offshore from the project site. Three (3) profiles were created along the beach indicating the width and slope of both the submerged and dry portions of the beach and showing major features of the beach. Figure 2.1 on the next page shows the three beach profile sections prepared for this project by Sea Engineering, Inc.

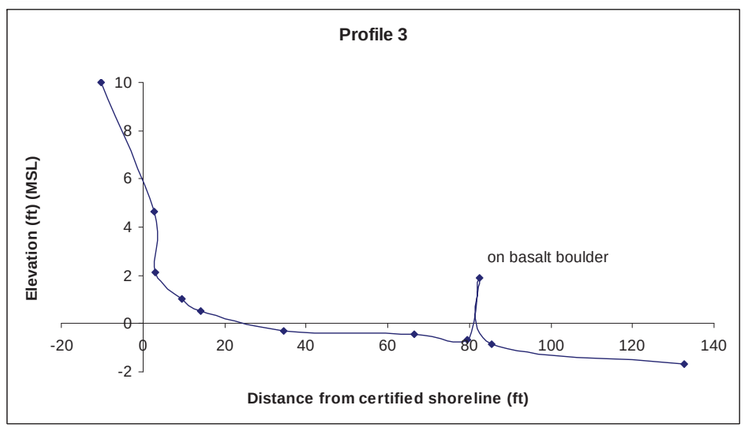
BEACH PROFILE SECTIONS
FIGURE 2.1

SITE LAYOUT AND PROFILE LOCATIONS

SITE PROFILES







Waves and Currents

The general Hawaiian wave climate can be described by five primary wave types: 1) northeast tradewind waves generated by the prevailing northeast winds, 2) north Pacific swell generated by mid-latitude low pressure systems, 3) southern swell generated by mid-latitude storms of the southern hemisphere, 4) Kona storm waves generated by local low pressure storm systems, and 5) hurricane waves generated by nearby tropical storms and hurricanes. Northeast tradewind waves occur throughout the year, but the other wave types have seasonal distributions. North Pacific swell and Kona storm waves typically occur from October through March during the northern hemisphere winter. Conversely, southern swells typically occur from April through September during the southern hemisphere winter. Hurricanes and tropical storms are also summer and fall phenomena.

The southwestern shore of Kāneʻohe Bay is sheltered from wave attack from the east by the Mōkapu Peninsula and by the Island of Oʻahu from waves from the south and west. Waves that enter the bay from the north and northeast are greatly reduced by the wide and shallow reef protecting Kāneʻohe Bay. Analysis of the bathymetry of Kāneʻohe Bay shows that the maximum wind fetch distance for the project site is 5,250 feet to the east (70 degrees) with an average depth of 43 feet. Utilizing Automated Coastal Engineering Software (ACES) waves generated by maximum 27 knot tradewinds blowing across the bay would be 1.1 feet high. These wind waves would break in water of 1.4 to 1.8 feet deep. The height of larger storm waves would be limited by the depth of water on the reef flat.

During 50 years of tidal measurements in Kāneʻohe Bay, the mean higher high water (MHHW) level in the bay has been 1.07 feet above mean sea level (MSL). Assuming an average reef elevation of 1.5 feet near the shoreline, this maximum water level would have allowed a maximum wave height of about 1.5 feet at the project site.

During the moderate trade wind conditions prevailing during the site visit, small, 0.5 foot waves occurred at the shoreline. Although this section of Kāneʻohe Bay is generally protected from significant wave and currents action, high tides and storm surges from Kāneʻohe Bay can submerge most, if not all, of the shoreline and reach the base of the property cliff. "Flanking erosion" is a coastal process that occurs at the ends of seawalls where wave energy is typically reflected from a seawall sideways along the shore. This can cause adjacent coastal bluffs without shoreline hardening protection to erode faster because of the increase energy received from waves reflecting from a seawall.

Coastal Hazard History

The *Windward Oʻahu Hurricane Vulnerability Study* (Sea Engineering, 1990) describes the winds produced by a hypothetical worse-case scenario hurricane which could occur in Hawaiʻi. Maximum wind speeds of 100 knots would be generated by the scenario. The study calculated that the approach of such a hypothetical hurricane at Kāneʻohe could generate wave run-up heights

within the bay of 10.4 feet at a profile 1,200 feet to the west of the site and 11.9 feet at a profile 8,000 feet to the south of the site. However, a hurricane has not impacted Kaneohe Bay during recorded history.

The National Flood Insurance Program's Flood Inundation Rate Map (FIRM) assigns this area of Kahalu'u a zone D rating which means the flood hazard is undetermined. Loomis (1976) list tsunami wave run up heights of 2 feet for the 1946 tsunami and 1 foot for the 1952 tsunami.

Existing Seawalls Nearby

A 2-foot high seawall exists on the adjacent property to the west. The adjacent property immediately to the east does not have a seawall but a massive basalt outcrop extending into the water. Along this coastal stretch of privately owned residential properties, the majority of shoreline properties to the east and west beyond the project site are protected by seawalls, some of which extend out into the water. This property and neighboring property to the east are the only two residential properties without a seawall. Based on discussions held with the adjacent landowner, they are also currently seeking a shoreline setback variance approval for improvements within their shoreline setback area. Their preliminary plans propose a seawall or similar structure.

Since these two properties are the last remaining properties along this coastline without a seawall, it is likely they are more susceptible to flanking erosion. The photo below views the project site from north (🡻).

Photo (2004) showing project site in relation to neighboring seawalls.

2.3 PROJECT NEED AND OBJECTIVE

A geotechnical engineering report prepared by Applied Geosciences detailing their soils investigation was completed on April 26, 2007. This report presents an assessment of the surface and subsurface soil conditions and provides geotechnical counsel on construction of shoreline improvements associated with residential use of the property. Drilling and sampling of soil borings was conducted, followed by laboratory testing and analysis. A copy of the geotechnical report is provided in Appendix D of this document.

In summary, hard rock was encountered in the majority of the borings at relatively shallow depths. However, hard rock was not encountered in all the borings and it cannot be assumed to underlay the entire property. At the surface, predominantly silt and clay soils were present, namely moist plastic clayey silt (MH) serving as the topsoil combined with red clayey silt (MH) beneath it. According to the United States Department of Agriculture, Soil Conservation Service's soil survey report for the Island of Oahu, characteristics of the existing soils on the parcel consists of slow to moderately slow permeability, slight to moderate erosion hazard, and runoff is medium.

The eastern portion of the property has low probability of a significant head cut into the slope resulting from deep-seated slope failures. The western portion of the shoreline is a vertical cliff and unstable. If left in its present condition and no slope stabilization measures are implemented, it will result in additional erosion and shallow sliding of soil and rock material into the ocean. Consequently, the owner wishes to stabilize the existing shoreline slope and implement minimal improvements in order to establish a safe shoreline environment which protects the residential structures and uses of the property.

2.4 DESCRIPTION OF SHORELINE IMPROVEMENTS

The project will consist of implementing improvements within the City's 40-foot Shoreline Setback Area to stabilize the property's slope. The improvements consist of an 18-inch rock wall, concrete stairs, and erosion control mesh system. Other accessory improvements within the shoreline setback area include demolition and removal of concrete debris, landscaping, and a 4-inch drainage line. Figure 2.2 includes a Conceptual Site Plan for these shoreline improvements, Figure 2.3 includes a preliminary Grading Plan and Figure 2.4 includes a demolition and erosion control plan.

Conceptual Site Plan

The 18-inch wall is located at the top of the existing slope and will not permanently establish the property's shoreline because of its location which is setback away from the shoreline. From a break in this wall, the stairs will begin and lead down to the ocean. The stairs start from the top of slope to an unpaved level landing. The landing would be approximately 30 feet by 6 feet and landscaped. The staircase then turns and goes to the shoreline and ends before reaching the certified shoreline. This conceptual plan minimizes the amount of grading and walls within the shoreline setback area as well as providing safe access to the ocean. With the exception of the

stairs and landing area, the existing slope will remain undisturbed and an anchored wire mesh erosion control blanket will be installed to stabilize the area. Also within the shoreline setback area, a 6-foot-high fence along the west and east property boundaries will be built extending mauka from the 18-inch wall to connect with the property fence.

The stairs will have 7-inch risers and 11-inch treads. The first set of stairs would lead to a level landscaped landing with a finish grade of approximately 11-feet above MSL. The second set of stairs will depart from the landing to an approximately 7.50-foot elevation towards the bottom of the existing slope. Based on this layout, the entire footprint of the stairs and landing would be located mauka of the certified shoreline.

Grading Concept

The amount of grading required would be limited to the staircase and rock wall within the shoreline setback. With the exception of these areas, the existing slope will be cleared of excess debris and loose materials. The remaining slope will remain undisturbed. An anchored wire mesh erosion control blanket will be installed to stabilize the existing slope.

The anchored erosion control mesh system will be used to control erosion of soil from embankment and steep slopes. The proposed system consists of a high-tensile steel wire mesh to be used in combination with soil nails. The mesh is fastened by soil nails to the slope and presses against the slope surface. The wire mesh prevents material in loose or weathered slopes from slipping. It will serve to stabilize the unconsolidated material and soils of the steep slopes within the property's shoreline setback area. The "open" structure of this system allows greening to surface through the mesh and is suitable for planting. The proper design and installation of this system, in addition to proper landscaping, will help to ease the visual impacts of the project. The end product would result in a landscaped slope with vegetation covering the underlying erosion control mesh system.

Drainage Concept

To mitigate the potential increased risk of slope instability due to soil saturation from the rainfall runoff from the house roof and deck area, 4-inch drain pipes connected to the roof downspouts and deck trench drains would be provided. These drain lines would connect near the top of the existing slope, run below the proposed stairs, and will terminate at the bottom of the existing slope to allow the discharge into the ocean.

Since the conceptual development plan primarily consists of replacing "natural" vegetation with landscape material, there is no significant difference in runoff quantities from the runoff quantities generated from within the shoreline setback area.

Erosion Control Measures

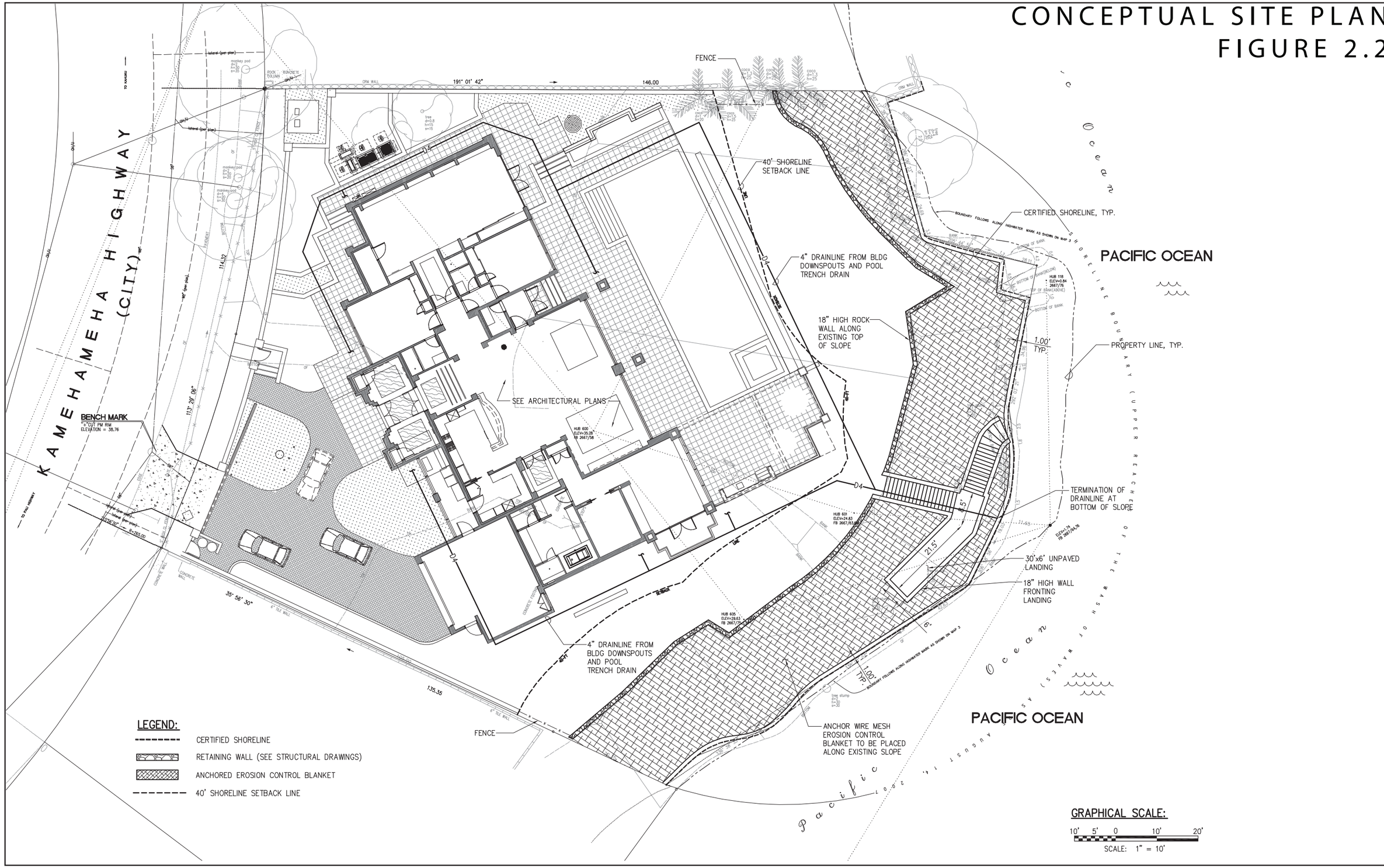
Runoff from the residential dwelling, driveway, patios, and impervious portions of the property was calculated. A 10-year storm has the potential to discharge a total of approximately 2.31 cubic feet per second (cfs) from the entire developed drainage areas. This developed condition would increase the total runoff from the project area by approximately 1.38 cfs (from 0.93 cfs). Similar to the existing conditions, the proposed runoff will continue to flow towards the Pacific Ocean and Kamehameha Highway. Of the 2.31 cfs total discharge, 0.04 cfs will be directed towards Kamehameha Highway while 2.27 cfs will flow towards the Pacific Ocean.

The existing slopes within the project site are moderate and extremely steep near the shoreline area. Therefore temporary and permanent erosion control measures need to be implemented as best management practices (BMP's) during construction. An additional BMP recommended would be to begin construction during dry months of the year and during low tide levels throughout the day. Temporary erosion control measures to be followed include using silt fences, stabilized construction entrances, turbidity curtains, and erosion control blankets. Permanent erosion control measures include some grading to provide proper drainage and utilizing an anchor wire mesh erosion control blanket upon the face of the existing slope fronting the shoreline. Exposed areas will be grassed and/or landscaped to match the rest of the property. Landscaping using native plants, such as *Naupaka*, will be planted as soon as these areas are completed to minimize erosion. Thus, proper grading, and immediate grassing and landscaping over all open areas created by the grading operations will minimize soil loss from the site to acceptable levels.

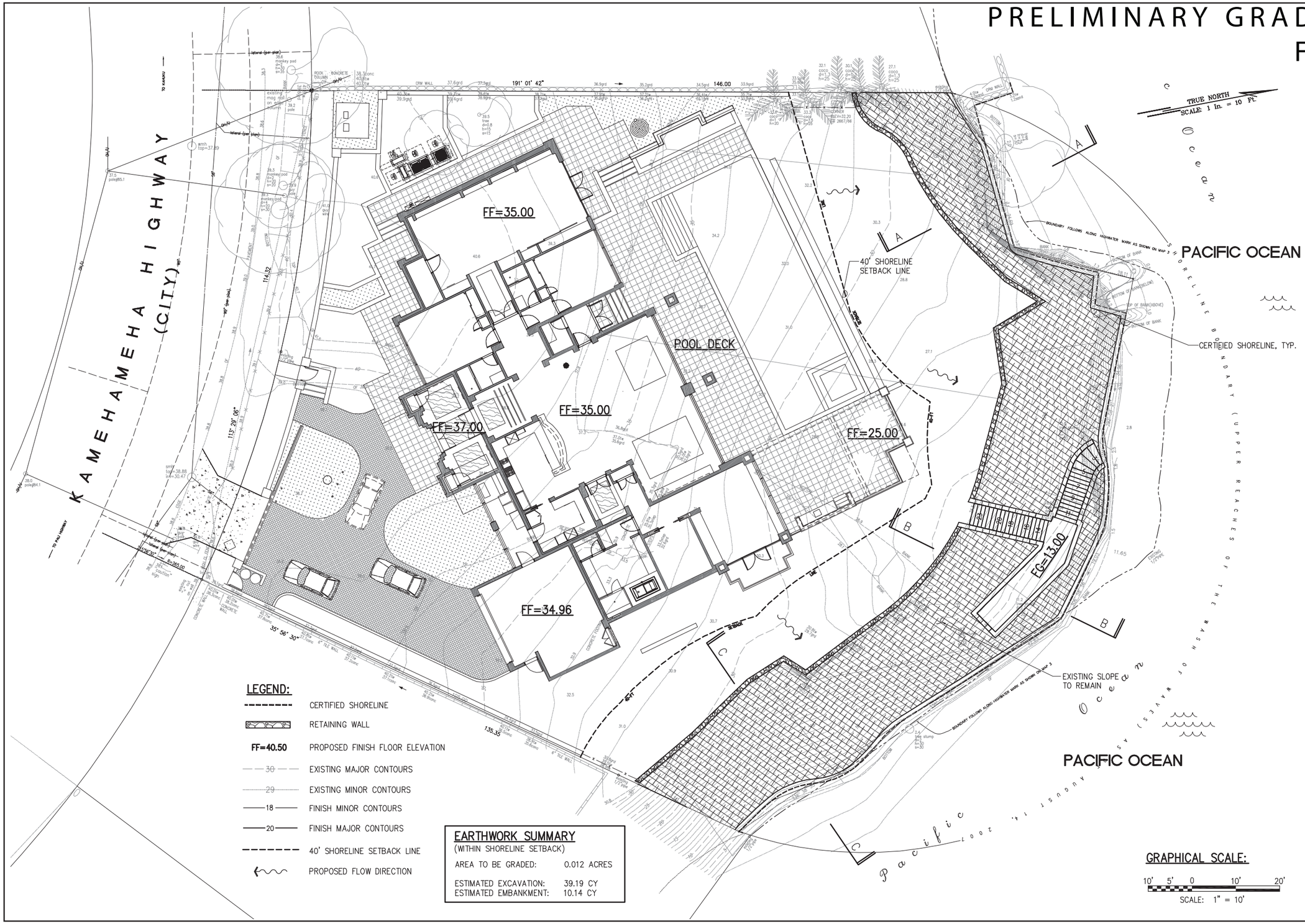
The above mentioned erosion control measures will minimize potential sediment runoff to existing discharge points, reducing the amount of soil loss to acceptable levels. During construction, the contractor will also use mulching to provide the additional erosion control. The permanent erosion control measures proposed will protect the site against future soil erosion.

As this project is located along the shoreline, careful and cautious measures must be taken when carrying out the above erosion control measures. By not following the above measures, further sediment may be discharged into Kāneʻohe Bay that may adversely affect the surrounding aquatic life (fish, reef, coral, etc.). Lastly, the City and County of Honolulu has special requirements for all projects that discharge into Class I or Class AA waters. Kāneʻohe Bay is considered Class AA waters and this project will fall under these requirements. As a result, additional BMP measures shall be considered to mitigate the potential impacts of any discharge.

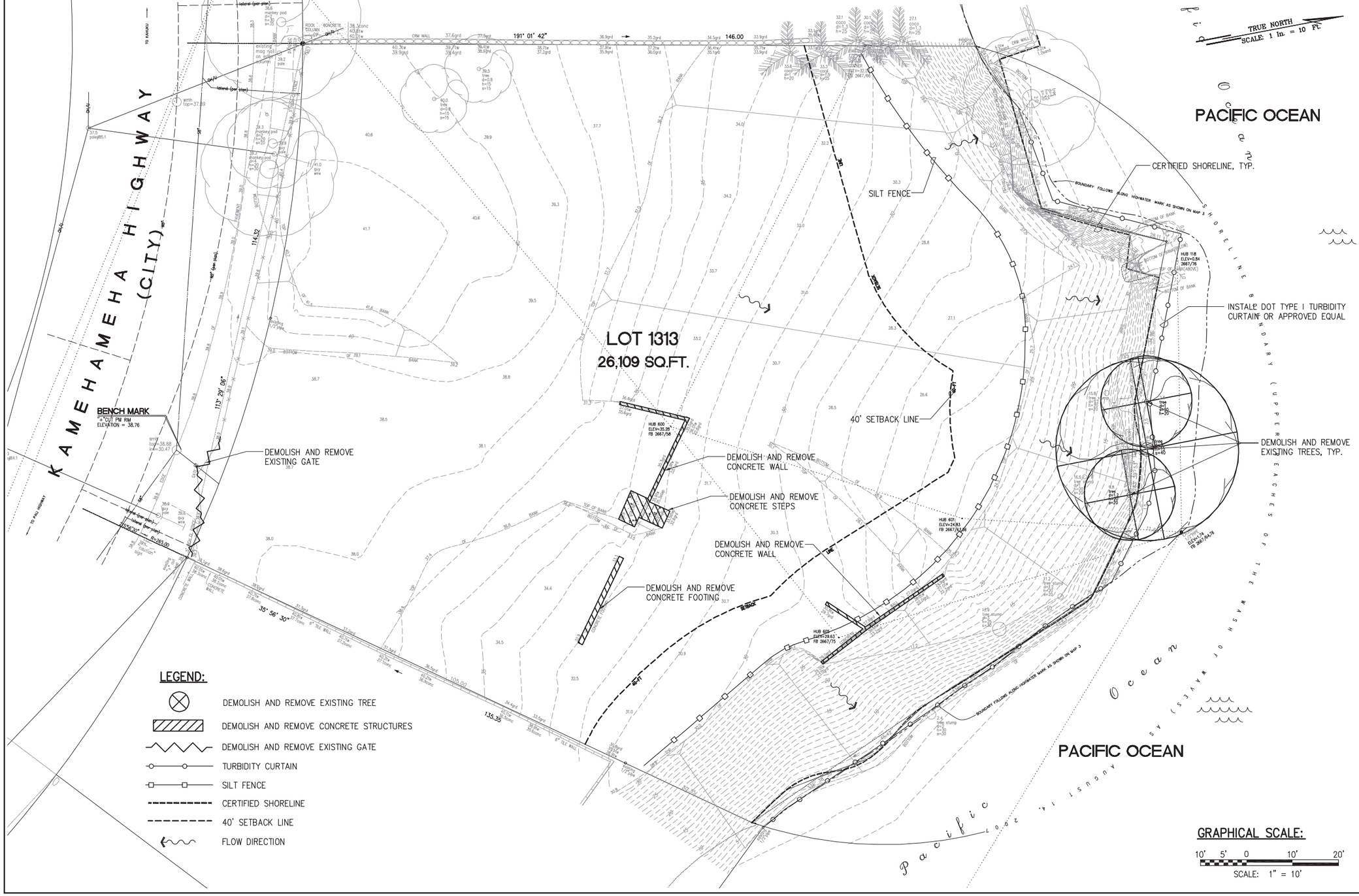
CONCEPTUAL SITE PLAN
FIGURE 2.2



PRELIMINARY GRADING PLAN
FIGURE 2.3



DEMOLITION AND EROSION CONTROL PLAN
FIGURE 2.4



2.5 LISTING OF REQUIRED PERMITS

The following permits would be required for this project.

Federal

Department of Army Permit

State

National Pollutant Discharge Elimination System (NPDES) permit

City and County of Honolulu Permits

Shoreline Setback Variance

Minor Shoreline Structure Permit

Building Permit

2.6 ALTERNATIVES CONSIDERED

Based upon early consultation and meetings with public agencies, a few concepts for the shoreline improvements were considered throughout the progression of this project. The preferred alternative was selected and discussed in the previous section.

No Action Alternative

This alternative focuses on not implementing the proposed project and leaving the project area as is. This alternative was dismissed from consideration because of the current conditions of the shoreline area. The existing conditions would remain hazardous and the shoreline slopes would continue to erode as indicated in the coastal engineering report and geotechnical engineering report found in Appendices C and D, respectively.

Delayed Action Alternative

This alternative looks at delaying the proposed shoreline improvements to a later date. Similar to the no action alternative this alternative does not adequately address the project needs and has been dismissed from further consideration. Furthermore, the preferred construction method for the shoreline improvements would require access and staging areas to be located on-site and outside of the shoreline setback area which is not possible with the delayed action alternative.

Alternative Concepts: Shoreline Improvements

During the early consultation process conducted for this project. A few alternatives to satisfy the project needs were identified. The following concepts were developed and dismisses based on various reasons described below. The main reason why these alternatives were eliminated is due to the potential for adverse impacts to the shoreline and coastal resources. Conceptual site plans for alternatives considered are included in Appendix E.

Option 1: Terracing (3 Walls)

Since moderate to severe slopes are present near the shoreline, the use of terracing and installing retaining walls was considered in this option. A proposed three (3) level terrace system would be divided by three (3) sets of retaining walls. The proposed seawall located at the toe of the slope would be approximately 6 feet high. A ramp would be located within this wall for access to the beach. A 15 foot wide "flat" area would be directly mauka of the proposed 6 foot high retaining wall. A secondary 8 foot high wall would be located along the middle of the existing slope. Finally, a third wall would be placed along the existing top of slope. An access stairway would run through each level for access to and from the three (3) levels. Also, shotcrete would be used to stabilize the undermined cliff located at the west corner of the property,

Option 2: Stabilize Existing Slope and Shoreline Retention Wall

This option minimizes the use of retaining walls and incorporates only one (1) seawall at the toe of the existing slope. A 10 foot wide landscaped area would be located directly mauka of the proposed retaining seawall. The location of the existing undermined cliff located near the west corner of the property would not have this 10 foot wide area because field conditions prevent the installation of a retaining wall along the area of the existing undermined cliff. Revetment would be installed in lieu of a seawall. A pathway resembling stairs and consisting of railroad ties would be incorporated to provide access to and from the top and bottom levels.

Option 3: Stabilize Existing Slope, Shoreline Retention Wall, and 2' High Intermediate Wall

This option is identical to Option 2 but includes a 2' high intermediate wall within the existing slope. This option would have a total of two (2) walls in addition to the features mentioned in Option 2. This includes a seawall at the toe of the slope and the 10 foot wide landscaped area.

CHAPTER 3
PHYSICAL AND BIOLOGICAL ENVIRONMENT

This chapter discusses the existing physical and biological environment in the project area, and the probable impacts resulting from the Meyer Residence Shoreline Improvement Project. Mitigative measures, if necessary, are also discussed.

3.1 CLIMATE, TOPOGRAPHY, AND SOILS

O'ahu's climate is relatively moderate, although moderate differences may occur from one location to another due to mountainous topography. Annual and daily variation in temperature depends to a large degree on elevation above sea level, distance inland, and exposure to the trade winds. On O'ahu, the Koolau and Wai'anae mountain ranges are oriented almost perpendicular to the trade winds which account for much of the variation in local climatology.

Temperatures in the Kahalu'u area are very moderate with average monthly minimum and maximum temperatures ranging from 72 degrees to 83 degrees Fahrenheit (F). Winds are predominantly "trade winds" from the east-northeast, except for occasional periods when "Kona" storms generate strong winds from the south, or when the trade winds are week and land breeze to sea breeze circulations develop. Trade wind speeds average between 5 and 15 miles per hour providing relatively good ventilation throughout the island.

3.1.1 Topography

The project site is located within the shoreline setback area of a coastal property along Kāne'ohe Bay. Elevations on the property range from approximately 50 feet above mean sea level (msl) at Kamehameha Highway to sea level at its boundary abutting the shoreline. A steep earthen bank abuts the shoreline which varies from near vertical to overhanging. Photos showing the topography of the shoreline have been included in Appendix A of this Draft EA.

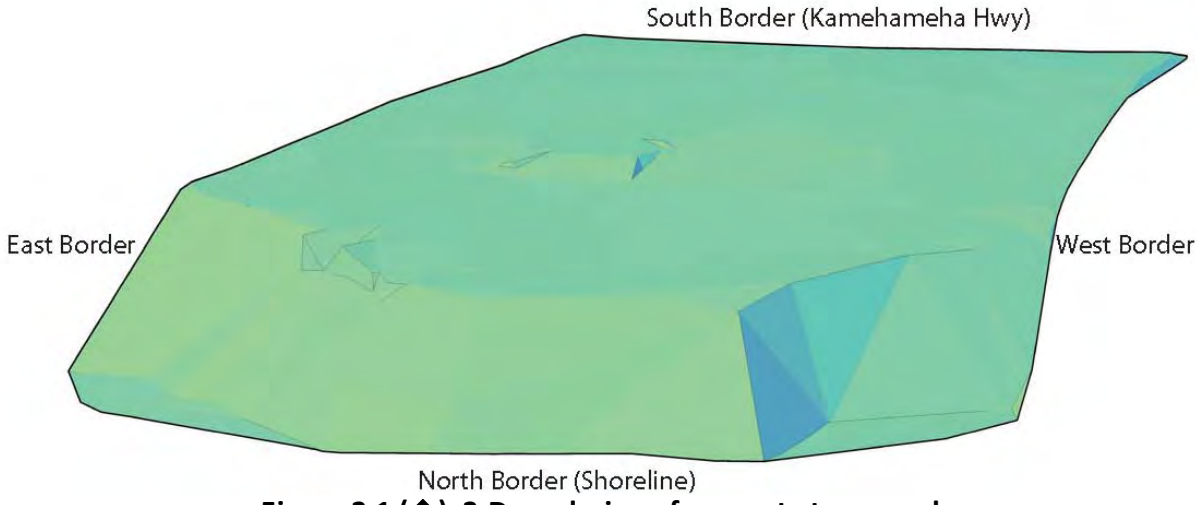


Figure 3.1 (↑) 3-D rendering of property topography.

3.1.2 Soils

The U.S. Department of Agriculture, Soil Conservation Service's *Soil Survey of Islands Kaua'i, O'ahu, Maui, Moloka'i, and Lāna'i, State of Hawai'i* includes general soil maps developed for these islands based upon soil surveys. As indicated by the soil maps, the project site is situated within the *Kaena-Waialua Association.* This association occurs as a narrow band along the northern and eastern coastline on the Island of O'ahu. The specific soil type present within the project site is found in the *Kokokahi Series.* A brief description of this soil type is included below. Figure 3.1 shows the soil types in the project area and vicinity.

Kokokahi clay, 6 to12 percent slopes (KtC). For Kokokahi clay, permeability is slow to moderately slow and runoff is medium with a moderate to slight water erosion hazard. This soil is generally used for pasture and homesites.

Probable Soils Impacts

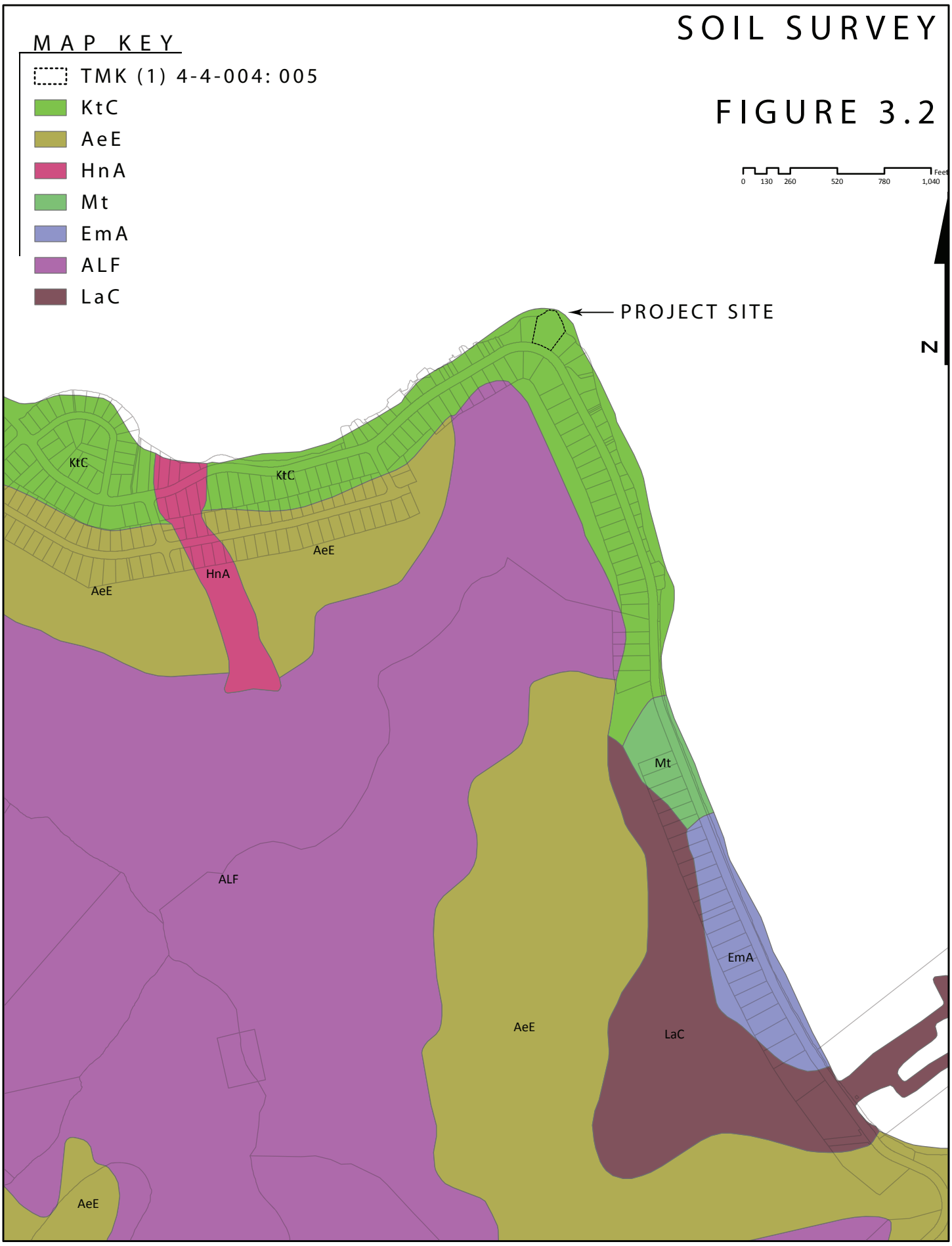
Short-term impacts to soils would be related with construction of the shoreline improvements described in Chapter 2. These improvements would occur in a relatively small area within the property and would not require work to be conducted outside of the shoreline setback area or makai of the certified shoreline. Careful consideration would be made to control erosion during construction.

In addition to the proposed erosion control system, long-term erosion control measures such as planting and landscaping would be implemented as soon as finished grades have been completed. In addition, various applicable mitigative measures will be incorporated into the project's design to minimize potential short-term erosion impacts during construction activities. As described in Chapter 2, erosion control measures may include: use of temporary silt fencing, sand bags, or screens; minimizing areas disturbed during construction; or the sodding of affected areas immediately after work has been completed.

The actual erosion measures to be implemented would be developed during the final design of this project. Design plans containing these measures would be submitted to pertinent agencies for their ministerial review and approval. These plans would comply with the City's erosion and sedimentation control regulations, State Department of Health NPDES permit requirements, and other applicable governmental permits or regulatory requirements.

SOIL SURVEY

FIGURE 3.2



3.2 AIR QUALITY

National ambient air quality standards (AAQS) have been established by the U.S. Environmental Protection Agency (EPA) for six criteria pollutants: carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone, and concentrations of particulate matter less than 10 microns (PM_{10}) and 2.5 microns ($PM_{2.5}$). Since 2003, the State of Hawai'i began participating in the National $PM_{2.5}$ speciation monitoring program. Additionally, a State standard has been established for hydrogen sulfide. Hawai'i air quality standards are more stringent than national standards, except for those pertaining to sulfur dioxide and particulate matter. A summary of both State and Federal AAQS is presented below:

Table 2 Summary of Federal and State Ambient Air Quality Standards

Sampling Pollutant	Federal Period	Federal Primary	State Secondary	Standards	
Carbon Monoxide		1-Hour	40	40 10	
	8-Hour 10	10	5		
Nitrogen Dioxide		Annual	100	100 70	
Sulfur Dioxide	3-Hour	n/a	1,300	1,300	24-Hour
	365 n/a	365	Annual	80 n/a	80
Lead Quarter	1.5	1.5	1.5		
Ozone	1-Hour	235	235	n/a	
	8-Hour 157	157	157		
PM_{10} Annual	50	50	50	24-Hour	150
	150 150				
$PM_{2.5}$ Annual	15	15	n/a	24-Hour	65
	65 n/a				
Hydrogen Sulfide		1-Hour	n/a	n/a 35	

Note: All concentrations in micrograms per cubic meter ($\mu g/m^3$) except for carbon monoxide which is in milligrams per cubic meter (mg/m^3)

Air quality in Hawai'i is generally characterized as relatively clean and low in pollution, and continues to be one of the best in the nation. The State DOH operates a network of air quality monitoring stations located in a number of areas across O'ahu. Based upon available annual emissions data reported for O'ahu between 2001 and 2005 by the State DOH, all emissions associated with pollutant criteria monitored are well below both State and National AAQS (DOH 2005). Northeast trade winds that are predominant throughout the year typically carry emissions and other pollutants from inland areas toward the ocean.

Probable Impacts on Air Quality

Impacts on ambient air quality associated with this project would primarily be limited to short-term construction activities including exhaust emissions form construction vehicles and dust generated by short-term, construction-related activities. Grading of the project area could generate airborne dust particles. All work shall be in conformance with State air pollution controls prescribed under the DOH rules contained in Hawai'i Administrative Rules, Title 11, Chapters 59, "Ambient Air Quality Standards," and Chapter 60, "Air Pollution Control." A dust control plan would be prepared and implemented to have the contractor comply with

DOH rules and regulations. Some measures that could be considered during the project's design for implementation by the contactor may include:

1. *Limiting areas that are disturbed at any given time.*
2. *Applying chemical soil stabilizers, mulching, or using wind screens.*
3. *Establishing landscaping early in the construction schedule to control dust.*

Once the project is completed, there would be no continuing activities occurring at the project site that would generate significant amounts of air pollution which exceeds State or National standards. Therefore, this project would not have a significant impact on air quality.

3.3 NOISE

Since the project is located in a residential area, existing ambient noise levels in the vicinity of the project site could be considered relatively low. The existing primary noise source through this project area can be attributed to vehicular traffic traveling on Kamehameha Highway.

Probable Noise Impacts

The only project related improvements that would have the potential to increase existing ambient noise levels are those associated with short-term and temporary construction activities. Once completed, the residential site and accessory improvements planned would not be a source of significant long-term noise.

Improvements constructed are expected to temporarily increase ambient noise levels within the vicinity of the project site. Potential noise sources would include construction vehicles, minor grading work, and other power equipment. However, the additional noise generated is not expected to have a significant impact on noise sensitive resources, such as the surrounding residential uses, because the work is temporary and will be conducted during the daytime.

Under the DOH's Community Noise Control regulations (Title 11, Chapter 46, HAR), the proposed residential site is situated within Class A zoning district. Therefore, the maximum permissible sound levels for construction activities is 55 dBA during daytime (7:00 a.m. to 10:00 p.m.) hours and 45 dBA during nighttime hours (10:00 p.m. to 7:00 a.m.). These levels should not be exceeded at or beyond the property line for more than 10 percent of any continuous 20-minute period. If necessary, a permit would be obtained by the contractor from the DOH to allow construction activities exceeding these noise levels. Specific permit restrictions for construction activities are:

1. No permit shall allow construction activities creating excessive noise before 7:00 a.m. and after 6:00 p.m. of the same day.
2. No permit shall allow construction activities that create excessive noise before 9:00 a.m. and after 6:00 p.m. on Saturdays.

3. No permit shall allow construction activities which exceed the allowable noise levels on Sundays and on holidays.

Therefore, short-term construction activities associated with implementing proposed project improvements are not expected to have a significant impact on noise.

3.4 VISUAL RESOURCES

This section addresses the project's effects on the visual resources associate with the project site and Kahaluʻu community. In order to assess the possible impacts, information associated with existing important visual resources in the areas was gathered. These visual resources consist of scenic resources such as major landforms, open spaces, viewing points, scenic drives, and other physical features that create the visual quality of the area. The framework also consists of City policies, guidelines, and regulations established to protect scenic resources that are of value and importance. Various references were researched to assist with identifying visual resources of the Kahaluʻu area. Sources identified consisted of the Koʻolaupoko Sustainable Communities Plan (SCP) and a Coastal View Study.

Koʻolaupoko Sustainable Communities Plan

The 2000 Koolaupoko Sustainable Communities Plan identified important visual resources within the Koʻolaupoko District. This plan has policies and guidelines in place to maintain and preserve the areas significant visual resources such as those from coastal roadways. In Map A-1, the plan identifies a significant "continuous" view plane along Kamehameha Highway directly adjacent to the project site which includes important mauka and makai corridor views of shoreline areas and coastal waters. The east Oʻahu coastline is recognized as one of the primary natural scenic resources in Koʻolaupoko.

Coastal View Study

A Coastal View Study was completed for the City's Department of Land Utilization (now known as the Department of Planning and Permitting) that inventoried significant coastal views and coastal land forms which together make up the scenic shoreline resources on Oʻahu. The study identified views from public viewing points and coastal roadways within the City's Special Management Area. The visual quality of an area was also characterized using three concepts which were: 1) vividness, 2) unity, and 3) intactness (Chu, 1987).

In Chu's study, the project site was identified being situated within the "Kāneʻohe Bay Viewshed" of the Koʻolaupoko area. This viewshed consists of two sections which are: 1) Kahaluu, and 2) Heʻeia. The project site is situated within the Kahaluʻu section which ranges from Kaoio Point to Heʻeia.

This section's most significant roadway views are identified at the Kualoa Regional Park and near Kahaluʻu Pond. Coastal views from roadways in the vicinity of the project site is limited to only Kamehameha Highway as it travels along the coastline. At the project site, this road was identified

as a coastal roadway having intermittent coastal views in the vicinity of Kahaluʻu due to the established residential community. The only significant pedestrian viewing points identified within this section are from Kualoa Park (Chu, 1987).

Probable Impacts On Visual Resources

Development of the project is not expected to have significant impacts on existing visual resources, nor negatively affect the visual character of surroundings. The project would primarily consist of the shoreline improvements to support the residential use and protection of the property.

The 18-inch wall within the shoreline setback area would be the only improvement potentially visible from Kamehameha Highway. The structure would be appropriately design that it will be visually compatible with the environment.

3.5 NATURAL HAZARDS

This section addresses natural hazards applicable to the shoreline improvement project. Of the potential natural hazards, only earthquakes, hurricane, and flooding hazards are applicable to the project site. There are no other known potential urban-related hazards near the project site such as airport clear zones, nuisances, or hazardous waste issues.

Earthquake Hazards

Earthquakes in the Hawaiian Islands are primarily associated with volcanic eruptions resulting from the inflation or shrinkage of magma reservoirs beneath which shift segments of the volcano (Macdonald et al., 1983). Earthquakes may occur before or during an eruption or from the underground movement of magma that moves to the surface. However, earthquakes also occur due to the shifting of tectonic plates.

Except for the Island of Hawaiʻi, the Hawaiian Islands are generally not situated in a high seismic area subject to numerous large earthquakes (Macdonald et al. 1983). Most of the earthquakes that have occurred in the past have been volcanic earthquakes causing little or no damage to the other islands. Available historical data indicates that the number of major earthquakes occurring have generally been fewer and of lower magnitude than those on other islands such as Hawaiʻi. Strong earthquakes of magnitude 5 or higher, based on the Richter Scale, can cause property damage and endanger lives (USGS 2002).

Volcanism is the source of energy for approximately 95 percent of the earthquakes on the Island of Hawaii. However, the area encompassing Maui and Oahu is identified as a "central region" where seismicity is generally related to tectonic activity on the seafloor near the Hawaiian Islands (USGS 2002). Tectonic activity capable of generating hazardous earthquakes in the central region is related to seafloor fractures and suspected faults around the islands. The largest of these are the Molokai Seismic Zone and the Diamond Head Fault.

The U.S. Geological Survey's *Atlas of Natural Hazards in the Hawaiian Coastal Zone* (USGS,

2002) assigned seismic hazard intensity ratings for all islands in the State of Hawai'i. This report assigned a relative ranking scale based upon a hazard intensity scale from 1 to 5 with 1 representing lowest hazard and 5 the highest. The southern half of O'ahu extending from Makaha around Diamond Head and Makapuu Head up to Kaneohe Bay was assigned a volcanic/seismic risk ranking of 3 due to the proximity to the Moloka'i Seismic Zone. The remainder of the island is ranked a 2 with respect to the volcanic/seismic hazard (USGS 2002).

Probable Earthquake Effects On Project

Although difficult to predict, an earthquake of sufficient magnitude causing structural or other damage to the project's facilities or infrastructure could occur in the future. However, most of the earthquakes that have occurred in the State were volcanic earthquakes causing little or no damage on the Island of Oahu.

Oahu is periodically subject to episodes of seismic activity of varying intensity due to its proximity to the Moloka'i Seismic Zone and the Diamond Head Fault. However, earthquakes cannot be avoided or predicted with any degree of certainty, and an earthquake of sufficient magnitude (greater than 5 on the Richter Scale) may cause damage to the proposed improvements. However, damages to the project should be minimal, as appropriate building code standards will be followed. Thus, the risk of potential damage to this project will be no greater than that of other residences or infrastructure facilities existing on the Island of O'ahu.

Hurricane Hazards

Hurricanes are tropical storms with winds equal to or greater than 74 miles per hour that develop as brewing storms gain energy from warm (>26.5 C) ocean waters. Hurricanes have affected every island in the State and can cause major damage and injury usually resulting from high winds, marine over-wash, heavy rains, tornadoes, and other intense small-scale winds and high waves.

Hurricanes are one type of tropical cyclones affecting the State which also include tropical storms and tropical depressions. Between 1970 and 1992, 105 tropical cyclones have been identified in the central Pacific region resulting in an average of 4.5 storms per year. Not all of these storms directly pass thru the State, and actual hurricane strikes on the Hawaiian Islands are relatively rare in the modern record. More commonly, near-misses that generate large swells and moderately high winds causing varying degrees of damage are the result of hurricanes passing close to the islands (USGS 2002).

The three major elements that make a hurricane hazardous are: 1) strong winds and gusts, 2) large waves and storm surge, and 3) heavy rainfall (FEMA 1993). Impacts from hurricanes can thus be severe and lead to beach erosion, large waves, high winds, and marine over-wash despite the fact that the hurricane may have missed a particular island (USGS 2002).

A hazard mitigation report prepared by the Federal Emergency Management Agency (FEMA) after Hurricane Iniki in 1992 determined that nine hurricanes approached within 300 nautical miles

(about one day's travel time) of the Hawaiian Islands' coastlines between 1970 and 1992 (FEMA 1993). Most hurricanes affecting the islands have focused on Kaua'i. Based upon a tracking of hurricanes since 1950, there appears to be no geographical or meteorological reasons why hurricanes miss other islands and tend to steer toward Kaua'i (FEMA 1993).

Probable Hurricane Effects on Project

A hurricane of significant strength and high winds passing directly over or close to the Island of O'ahu could cause damage to the proposed improvements. The main element of a hurricane that may cause damages to the project improvements are strong winds and gusts and large waves or other coastal water effects.

To minimize potential hurricane damages, the shoreline improvements would be designed and constructed in conformance to applicable building codes. Therefore, the risk of potential damage from high winds and waves should be minimized.

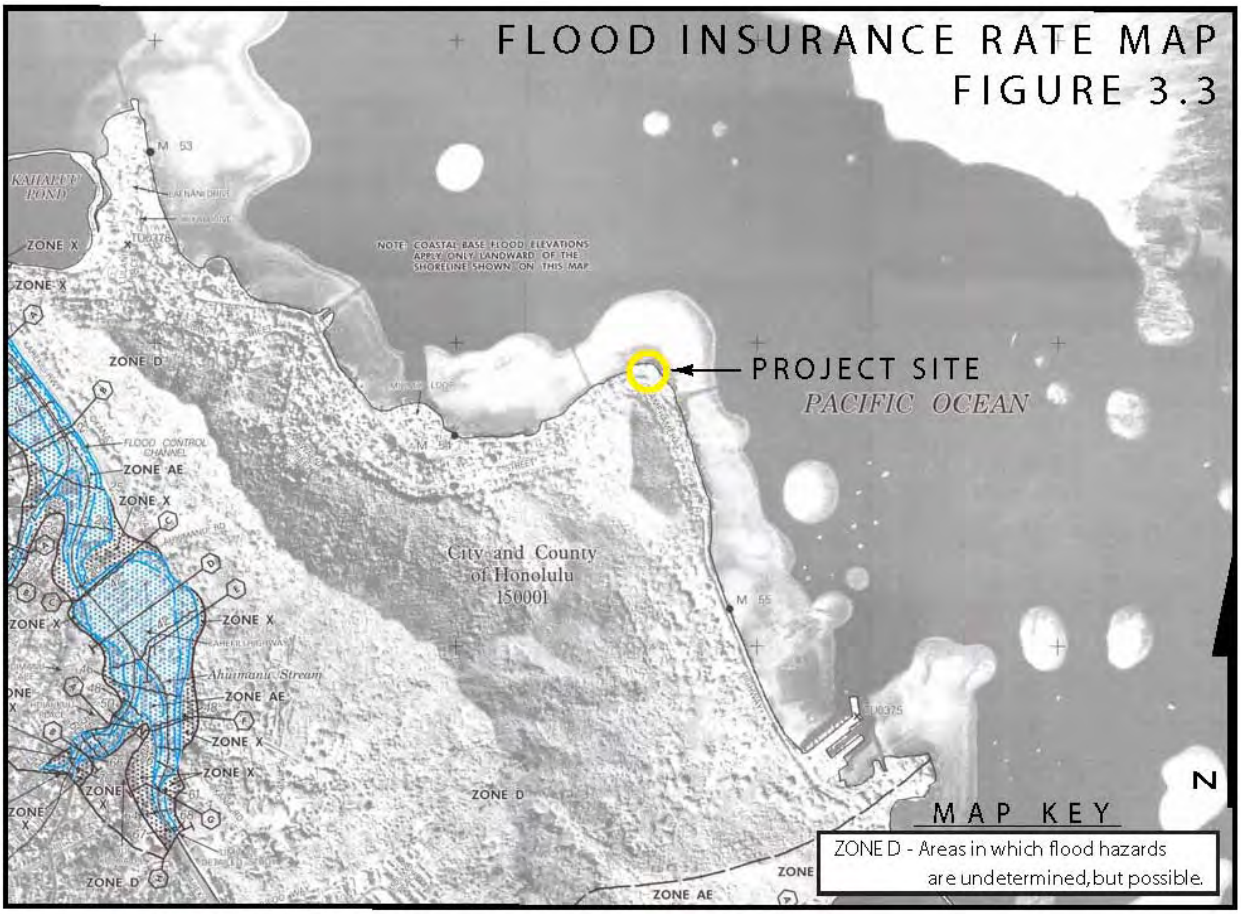
Flooding and Tsunami Inundation

Tsunamis are caused by a sudden movement of the seafloor that generates a series of waves which travel across the ocean until they reach a coastline. Seafloor movements may include faulting, landslides, or submarine volcanic eruptions. Landslides originating either under the sea or above sea level and then sliding into the water may also generate a tsunami. Tsunamis manifest themselves as either large breaking waves, often largest around headlands where they are concentrated by wave refraction, or as rapidly rising sea level like a flooding tide.

The high degree of volcanism and seismic instability in and around the Pacific Ocean has contributed to a history of tsunami occurrences. The coastline of the Hawaiian Islands is thus under the continuous threat of tsunami inundation because this region is one of the most geologically active regions on Earth. The geography of the shoreline often plays an important role in the form of the tsunami. Tsunami waves may be very large in an embayment, actually experiencing amplification in long funnel-shaped bays. Fringing and barrier reefs appear to have a mitigating influence on tsunamis by dispersing the wave energy (USGS 2002).

Floods caused by heavy rainfall and strong winds normally occur during the winter months with January typically being the most frequent flood period. Heavy rainfall can also be associated with the tropical storm and hurricane season between the months of June and October. Areas subject to recurrent rainstorm floods are generally the coastal plains and flood plains (USGS 2002).

Flood Insurance Rate Maps (FIRM) prepared by FEMA identifies flood areas on the Island of O'ahu. Based upon the FIRM No. 15003C0260F (revised September 30, 2004), the project site falls entirely within Zone D. Zone D represents an area in which flood hazards are undetermined but possible. Figure 3.3 shows the FIRM designations. Accordingly, the project site appears to be situated outside of any flood designated boundaries. Although the project site is situated along the shoreline, it is not subject to coastal flooding.



Probable Flood Effects on Project

Based upon the FIRM, the project site where the proposed shoreline improvements are planned is situated within Zone D. This area is also not subject to hazards associated with potential tsunami inundation that may occur along the coastline. Therefore, proposed improvements should not be subject to the effects and potential damages associated with these hazards. The improvements planned would also not significantly alter the existing character of the site making it more susceptible to damages from flooding or tsunami inundation. Therefore, this project should have no affect on these hazards or be significantly affected by these hazards.

To minimize potential damages, shoreline improvements would be designed and constructed in conformance to applicable building codes. Therefore, the risk of potential damage from flooding should be further minimized.

3.6 BIOLOGICAL ENVIRONMENT

3.6.1 Botanical Resources

Existing vegetation of the property mostly consists of low laying grasses and weeds. The following botanical species can also be found on the property: Monkey Pod (Samanea saman),

Avocado (Persea americana), Croton (Croton sp.), Ti leaf (Cordyline fruticosa), Coconut Palm (Cocos nucifera), False Kamani (Calophyllum inophyllum), Chinese Hibiscus (Hibiscus rosa-sinensis), and various alien grass species. There are no known rare, threatened, or endangered plant species in the vicinity of the project site.

The State Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife created maps showing the concentrations of threatened and endangered plant species throughout the major islands of the State. On these maps, each island is divided into distinct zones of threatened and endangered species concentrations, ranging from low to very high concentrations, and identifies area of little to no concentration. Based upon review of these maps, the project site is located on an area considered to have little to no threatened or endangered species.

Probable Effects on Botanical Resources

The project is not expected to have a significant negative impact on the botanical resources present on the site. None of the vegetation identified within this project site or immediate vicinity is known to be Federal- or State-listed threatened or endangered, or candidate threatened or endangered species. All of the plants can be found in similar vegetation types throughout the Kahalu'u and Kāne'ohe areas of the island. Also, there are no known natural or historic wetlands within the project site or immediate area. Therefore, the project is not expected to have a significant impact on existing botanical resources.

The long-term (post-construction) effects on botanical resources at shoreline in the project site is expected to have a generally beneficial impact on botanical resources along with the overall resource value Kāne'ohe Bay. This is due to the planned landscaping of the shoreline setback area utilizing native Hawaiian plants, such as Hawaiian *Naupaka Kahakai,* to eventually cover the entire mesh system.

3.6.2 Avifauna and Fauna

Due to the size and location of the property, the project site does not represent an area where avifauna or fauna would nest or forage for subsistence. Furthermore, there are no wetlands being impacted as part of this project.

Effects on Avifauna and Fauna

The shoreline improvements are expected to have no long-term (post-construction) effects on mammalian and avifaunal resources at the project site and surrounding areas. Such improvements would not affect any wetland habitats that fauna would potentially use; therefore, the proposed project would not present a threat to their presence. Short-term construction activities are also not expected to have a significant negative impact on existing mammals or avifauna that may be present in the project area.

3.7 HISTORIC, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

3.7.1 Historical and Archaeological Resources

Northeast O`ahu (Windward side) is made up of the Ko`olauloa (north) and Ko`olaupoko (south) districts bordered on the west by the Ko`olau Mountain Range. Within each district are land divisions called ahupua`a, which extend from the mountain ridges to beyond the reefs offshore. From north to south the nine ahupua`a within the Koʻolaupoko District are Kualoa, Hakipu`u, Waikane, Waiahole, Ka`alaea, Waihe`e, Kahalu`u, He`eia, and Kane`ohe. The project site is located within the Kahaluʻu ahupua'a.

Prior to the arrival of Captain James Cook (1776), Ko`olaupoko is known to have supported one of the largest populations in the islands. These lands were highly prized for their agricultural productivity. In becoming a highly productive area for growing subsistence, large freshwater streams were diverted to form `auwai (irrigation ditches) for cultivation of crops consisting of kalo (taro), `uala (sweet potato), `ulu (breadfruit), and mai`a (banana). Coastal resources were also important and at least 30 fishponds along the bay were constructed by ancient Hawaiians for marine resource cultivation, mainly fish.

In 1795, Kamehameha the Great conquered O`ahu, and because of Ko`olaupoko's beauty and riches, he chose to keep the ahupua`a of Kane`ohe and He`eia as his personal property, while apportioning the other parts of O`ahu to his warrior chiefs and counselors. Later, most of the ahupua'a of Kāneʻohe, all of Kahaluʻu, and Kualoa were eventually inherited by Kamehameha's sons, Liloliho (Kamehameha II) and Kauikeaouli (Kamehameha III). The Reverend Benjamin Parker is one of the earliest foreigners to acquire land in Koʻolaupoko. In 1834, Reverend Parker and his family settled in Kāneʻohe to open up the Kāneʻohe Mission Station.

Sugarcane cultivation in Koʻolaupoko was introduced around 1865. However, the five major sugar plantations closed by 1903 after almost four decades of sugar business in Ko`olaupoko. Around the time sugar growers were leaving Koʻolaupoko, farmers started growing rice and pineapples. Between the 1880's to the 1920's, Waihe`e, Waiahole, Waikane, Kahalu`u, He`eia, and Kane`ohe all had intensive rice fields, along with several rice mills. Pineapple cultivation emerged throughout Ko`olaupoko in the early 1900's as sugar and rice cultivation declined.

Probable Impacts on Historic and Archaeological Resources

It is not anticipated that the proposed project would any have significant impacts on cultural, historical, and/or archaeological resources. The project site has been significantly disturbed previously for residential uses, and is not expected to contain any historical, archaeological or Native Hawaiian cultural remains. However, in the event that iwi kupuna or native Hawaiian cultural deposits, cultural artifacts, subsurface human remains, or other indications of human activity 50 years or older are inadvertently discovered during the course of the project, work would cease immediately until the State Historic Preservation Division, and other appropriate government agencies have been contacted for further instruction. The

treatment of any human remains encountered would be determined, and conducted in accordance with the applicable requirements of Chapter 6E, Hawai'i Revised Statutes, and Chapter 13-300, Hawai'i Administrative Rules.

3.7.2 Cultural Resources

Traditional cultural practices are based on a profound awareness concerning the harmony between man and his surrounding natural resources. Early native Hawaiian populations depended on these cultural practices for their survival. A familiarity of with these specific environments afforded Hawaiian populations to derive systems that fostered sustainable uses for resources. Many of these cultural practices have been passed down from generation to generation. Many Hawaiian communities continue to observe these traditions and preserve their culture to maintain the continuity of these practices.

There are no known cultural practices which currently occur at the project site. The project site is not located in or adjacent to any heiau, fishponds, wetlands or traditional gathering areas. However, there are numerous cultural resources located in the Ko'olaupoko District located in the vicinity of the project site. These mainly consist of two major fishponds; He'eia Fishpond and Kahalu'u Fishpond. Each is historically and culturally significant and both are listed on National and State Registers of Historic Places (Source).

He'eia fishpond is located approximately 1.5 miles southeast of the project site. This is an ancient fishpond originally established over 600 years ago by He'eia ahupuaa residents as a stocking pond to cultivate fish and provide easy access to fishing during winter months. The fishpond is maintained and managed thru a partnership between Paepae o He'eia, a private non-profit organization, and the landowner, Kamehameha Schools.

Kahalu'u fishpond, also known as Kahouna fishpond, is located approximately 1.5 miles northwest of the project site. This fishpond was used by He'eia ahupuaa residents to trap and cultivate fish. There are currently two rental facilities located on the fishpond property, the Aloha Ke Akua Wedding Chapel and Pohai Ke Aloha Pavilion.

Probable Effects on Cultural Resources

In terms of cultural resources, the project is not expected to significantly affect traditional native Hawaiian cultural practices occurring within the Kahalu'u ahupua'a, Ko'olaupoko District. There are no known cultural practices currently occurring within the project site. There are no heiau known to exisit on the project site or immediate areas.

This project would not restrict access to other surrounding areas that may be used for cultural practices because the project is limited to the property and shoreline setback area. This project would not prevent access to shoreline areas or surrounding mauka areas that may be used for traditional gathering or other cultural practices. Furthermore, the property is currently surrounded by other residential lots. Temporary construction activities would not prohibit access to other land areas that may be considered significant for cultural purposes.

CHAPTER 4
ECONOMIC AND SOCIAL FACTORS

This chapter discusses the project's probable impact on economic and fiscal factors associated with the State and County, as well as social factors such as changes in resident population, housing, and character of the community.

4.1 EXISTING SOCIAL AND ECONOMIC CONTEXT

This section discusses the effects of the project on both the County and State's economic and fiscal factors. Project improvements will have different effects in relation to the City and the State of Hawai'i. Improvements proposed by this project should have a small minor positive economic impact mainly associated with the creation of short-term construction related jobs and increase in revenues of City property taxes.

Short-Term Construction Related Jobs

The projected construction cost for the shoreline improvements are conservatively estimated to be $587,000. This project would create several construction jobs over the anticipated 5 month construction period. In discussions of jobs and income, three broad types are distinguished:

- *Direct* jobs are immediately involved with construction of a project or with its operations.
- *Indirect* jobs are created as businesses directly involved with a project purchase goods and services in the local economy.
- *Induced* jobs are created as workers spend their income for goods and services.

Construction of the project improvements should have a minor short-term positive economic impact associated with the creation of short-term construction related jobs. Direct construction jobs would typically consist of on-site laborers, tradesmen, mechanical operators, supervisors, etc. These new jobs created would also generate additional personal income for construction workers. Personal income is defined as the wages paid to the direct construction workers. These construction jobs would likely be filled by residents from the Island of Oahu already employed within the construction industry.

Direct construction jobs created would also stimulate indirect and induced employment within other industries on the island such as retail, restaurants, material distributors, and other related businesses supporting the construction industry. These new jobs would generate additional personal income for construction workers of approximately $235,000. Personal income is defined as the wages paid to the direct construction workers or operational employees associated with a development. Indirect and induced income would also be generated from this project.

Fiscal Factors

Fiscal impacts associated with this project would primarily involve some additional tax revenue generated to the State due to construction costs expended for this project. Tax revenue sources for State government are composed primarily of general excise taxes (GET) on development costs and construction materials, along with corporate income tax, and personal income tax from construction workers. Construction related tax revenues would be one-time or short-term increases in revenue since they are only associated with construction activities.

In addition, GET taxes on indirect and induced income spent stimulated by the spending of direct income would also contribute new revenues to the State. The approximately $587,000 expended for renovation of the proposed project improvements was estimated to generate increased tax revenue of approximately $27,000 to the State.

The improvements planned for the project should contribute to the increased property value of residential site. Since City revenues are primarily derived from property tax revenues, there should be a small increase to the City revenues from this project. The project site is a privately-owned property that is not exempt from paying City property tax. Therefore, with the project improvements, there would be slight increases to the City property tax revenues.

4.2 SOCIAL IMPACT FACTORS

The shoreline improvement project is not expected to significantly change the existing resident population in the Kahaluʻu community or surrounding region. This project consists of construction of residential ancillary structures within the shoreline setback area of a privately-owned property. Implementation of the project would not displace any residents or businesses since construction would be limited to the project site already designated for residential use. As a result, there would be no significant impacts on the existing resident population.

This project would also not change or alter the character of the Kahaluʻu community because this project does not propose changes in conflict with existing uses in the surrounding area or have a significant impact on surrounding land uses.

Implementation of this project is expected to generate short-term construction jobs associated with construction activities. However, the creation of short-term construction jobs is not expected to generate any in-migration of workers to the Island of Oʻahu to fill these jobs. It is anticipated that qualified local contractors on the island or within the State of Hawaiʻi would likely be used for the project's construction. Consequently, the construction of this project would not have any long-term or permanent secondary effects on the number of resident construction workers in the City or State. Thus, the proposed project is not expected to change the social context of the area.

4.3 CUMULATIVE AND SECONDARY IMPACTS

Cumulative Impacts

Cumulative impacts are effects on the environment which result from the incremental impact of a project when added to past, present, and reasonably foreseeable future actions. The cumulative impacts associated with this project includes assessing the implementation of the shoreline improvements to evaluate it, and incorporating other known planned improvements within the area and study year that would effect or be affected by the project.

The discussion of impacts presented within this document addresses the cumulative impacts associated with the project and other reasonably foreseeable future actions being implemented. There are no major cumulative impacts associated with this project.

Secondary Impacts

Secondary impacts, or indirect effects, are effects which are caused by an action and are later in time or farther removed in distance, but are still reasonably foreseeable. Such effects may include growth-inducing impacts and other effects related to changes in land use patterns, population density or growth rate, and related effects on air, water, and other natural systems.

The proposed shoreline improvements are associated with residential use of a property within an established rural neighborhood within Kahaluʻu. The current condition of population and demography is not expected to be significantly affected by the minor nature of the project. This project is not expected to significantly affect the City's resident population growth for the Koʻolaupoko community and surrounding region, and thus would not generate the associated secondary effects on infrastructure, public facilities, and housing.

The proposed project is not expected to have any secondary impacts on land use patterns, public facilities and infrastructure, or the natural environment. The impacts of this project on the physical and biological environment, as described in Chapter 3, will be either totally unrelated to these areas of potential impact – as in the case of land use patterns – or will be at a very minor and generally beneficial level – as in the case of the natural environment. As such, there is no reasonable basis to expect that adverse secondary impacts could occur.

CHAPTER 5
PUBLIC AND INFRASTRUCTURE FACILITIES

This chapter discusses the project's probable impact on public and infrastructure facilities serving the Kahaluʻu community. Due to the nature of improvements proposed for this project, most of the impacts would be associated with construction-related activities. As a result, there should be minimal, if any, changes to infrastructure demands resulting from this project.

5.1 PUBLIC FACILITIES

The project site is located in a fully developed urban area with current access to all necessary residential services. This section discusses the project's impact on facilities or services available to the community within the vicinity of the project site. The public facilities available within the project area include recreation, medical, fire and police services, in addition to cable, television, and electric services.

Probable Impacts on Public Facilities

The proposed project would not require the extension of electrical or communication facilities to the shoreline setback area. Similarly, the proposed improvements would not result in a significant increase in service demands from police and fire protection or other public services. Since the project is consistent with the existing land use of the project site, no new major utility systems will be required to serve the property. Therefore, this project is not expected to have a significant impact on public facilities.

5.2 PUBLIC UTILITIES

This section discusses the utility facilities or services available within the project area which includes domestic water, wastewater, drainage, and solid waste facilities.

5.2.1 Domestic Water, Irrigation, and Fire Protection

Existing water service to the Kahaluʻu District is provided by the City & County of Honolulu, Board of Water Supply (BWS). There is no existing water facilities present within the project site. However, there is an existing 8-inch waterline serving the residences situated along Kamehameha Highway. There is currently no water service to the property. However, the property has water service assigned to it, but it is currently ordered "off" according to BWS. There is an existing meter box fronting property, but the previous ⅝-inch water meter (capacity of 20 gallons per minute (gpm)) was removed in 1980. The size of the existing water lateral is 1¼-inch. According to BWS, the smallest meter that would be currently required is a ¾-inch meter with a capacity of 30 gpm and a pressure of 100 pounds per square inch (psi).

Domestic water will serve the single-family dwelling. According to BWS Water System Standards, a single-family unit is projected to generate a proposed maximum daily demand of 1,500

gpd and a peak hour demand of 30,000 gpd. The fire demand is expected to be 1,000 gpm for the duration of one hour. According to the owner's landscape architect, the irrigation demand is anticipated to be 20 gpm. A sub-meter will be installed for dedicated irrigation use. The owner will pay the BWS for the installation of a new meter and water service lateral to serve the development.

Probable Impacts on Water Facilities

Completion of this project would likely result in a small increase in water demand associated with irrigation water demands for landscaping in the shoreline setback. However, this increase is not expected to have a significant impact on the BWS water system or source capacity. Construction plans will be appropriately coordinated with the BWS during the design phase of this project, and the availability of water will be confirmed when ministerial permits are applied for. Therefore this project is not expected to have a significant impact on water facilities.

5.2.2 Wastewater Facilities

Although the project site is currently undeveloped, the project site is equipped with a 6-inch sewer lateral that connects to the 8-inch sewer line along Kamehameha Highway. The sewer lateral is located on the southeast corner of property.

The property's dwelling consists of structures and activities which will generate wastewater. A 6-inch sewer lateral will travel along the property's driveway towards Kamehameha Highway and connect to the existing sewer lateral serving the property located near the southeast corner of the property.

Probable Impacts on Wastewater Facilities

There will be no improvements within the shoreline setback area requiring connection to the wastewater system. Therefore, this project is not expected to have a significant impact on wastewater facilities.

5.2.3 Drainage Facilities

There are no known existing drainage facilities within the project site or Kamehameha Highway. Due to the existing slopes and low soil permeability associated with the project site, the majority of storm water runoff does not infiltrate into the soil but discharges from the site as surface runoff. The majority of the existing storm water runoff from the project site sheet flows in the northern (makai) direction following the existing property topography. This runoff eventually leads into Kāneʻohe Bay. The remaining portion of the existing runoff sheet flows towards Kamehameha Highway.

The existing undeveloped conditions produce a runoff of approximately 0.93 cubic feet per second (cfs) based on a 10-year storm. Approximately 0.02 cfs discharges towards Kamehameha Highway while 0.91 cfs sheet flows towards the ocean.

Based on a site plan of the dwelling, the runoff from impervious surfaces was calculated and

found that a 10-year storm could potentially discharge approximately 2.31 cfs from the entire developed drainage areas. This results in an increase of about 1.38 cfs from existing conditions. Similar to the existing conditions, the proposed runoff will continue to flow towards the Pacific Ocean and Kamehameha Highway, respectively.

Probable Impacts on Drainage Facilities

As required by the City, a drainage plan and report has been prepared for the proposed project and dwelling in conformance with the City's "Rules Relating to Storm Drainage Standards."

As this project is located along the shoreline, careful and cautious measures must be taken when carrying out the erosion control measures described in Chapter 2. By not following those measures, further sediment may be discharged into Kāneʻohe Bay that may adversely affect the surrounding aquatic life and water quality. The City has special requirements for all projects that discharge into Class I or Class AA waters. As Kāneʻohe Bay is classified as a Class AA waters, this project will fall under these requirements. As a result, additional BMP measures will be considered to mitigate the potential impacts of any discharge. A site specific construction BMP plan will be submitted to the State Department of Health (DOH) prior to grading commencement. All construction related discharges will comply with the State's Water Quality Standards. Drainage plans will also be reviewed and approved by the City, and necessary improvements implemented.

As stated previously, the existing slopes within the project site are moderate and extremely steep near the shoreline area. During construction of the shoreline improvements, special attention is needed to control runoff of the project site into Kāneʻohe Bay. Therefore, temporary and permanent erosion control measures need to be implemented as best management practices (BMP's) during construction. An additional BMP would be to begin construction during dry months of the year and during low tide levels throughout the day. Temporary erosion control measures include using silt fences, stabilized construction entrances, turbidity curtains, and erosion control blankets. Permanent erosion control measures include grading to provide proper drainage and utilizing an anchor wire mesh erosion control blanket upon the face of the existing slope fronting the shoreline. Areas covered by the anchor wire mesh will be landscaped to further minimize erosion and maximize soil retention.

5.2.4 Solid Waste

Solid waste collection and disposal operations serving the Kahaluʻu District is provided by the City's Department of Environmental Services, Division of Refuse Collection and Disposal. A private contractor would be responsible to properly dispose of all construction-related debris in conformance with City regulations.

Probable Impacts to Solid Waste Facilities

Construction of the proposed improvements will generate some solid waste typical of construction activities. The volume of solid waste is expected to be minor due to the limited area will be developed. Construction-related waste generation will be a short-term impact, and consist primarily of vegetation, rocks, and other debris created from clearing,excavation, grading, demolition, and construction activities. The contactor will be required to properly dispose of all solid waste in conformance with City regulations.

5.3 TRANSPORTATION FACILITIES

Current access to the project site is off Kamehameha Highway. However, there is no existing driveway or other private road facilities serving the project area from Kamehameha Highway. In this vicinity, Kamehameha Highway is an asphalt paved two-lane, two-way roadway under the jurisdiction of the City and County of Honolulu. This facility has a 50-foot wide right-of-way. There are no sidewalks or curb and gutters adjacent to the roadway, just landscaping and bare soil.

Property Roadway Access

There is also an existing bend in the roadway west of the project site that may result in sight distance issues from the subject property. A driveway coming off of Kamehameha Highway would be provided for access to the residence and would connect to the edge of the existing asphalt pavement. Due to the short sight distance caused by the curve in the alignment of Kamehameha Highway, the residential driveway would be located near the southeast corner of the site to provide the longest site distance along both directions of Kamehameha Highway.

Probable Impacts on Transportation Facilities

The proposed project could have short-term temporary impacts on the circulation on Kamehameha Highway due increases in construction traffic for the project. This may result in temporary delays, however because all construction would occur on the owner's property, such disruptions to traffic is expected to be minimal. With the project, there should be no long-term adverse effects on existing transportation facilities serving the surrounding area.

CHAPTER 6
CONFORMANCE WITH PLANS AND POLICIES

This chapter discusses the project's conformance with the State Land Use District regulations, the State Environmental Policy, the City's General Plan goals and policies, Zoning District Standards, and the Koʻolaupoko Sustainable Communities Plan.

6.1 STATE LAND USE DISTRICT

The State Land Use Boundary Map for the Kahaluʻu region indicated that the project site is located within the State's Urban District, as previously shown on Figure 1.3 in Chapter 1.

State Urban District

Permitted uses or activities within the Urban District are provided by ordinances or regulations of the county within which the Urban District is situated. Thus, Urban District lands on the Island of Oʻahu are regulated by the ordinances and regulations of the City and County of Honolulu. The single-family residential use of the project site is a permitted land use in the Urban District. Thus, the proposed shoreline improvements are also permitted as ancillary uses of the residential dwelling.

6.2 CHAPTER 344, STATE ENVIRONMENTAL POLICY

Adopted in 1974, Chapter 344 established the State Environmental Policy to encourage the enjoyable harmony between people and their environment, conservation natural resources and the enhancement of quality of life. This section discusses the project's conformance and consistency with the pertinent policies and guidelines described under Chapter 344, HRS.

Environmental Policy

1. ***Conserve the natural resources, so that land, water, mineral, visual, air and other natural resources are protected by controlling pollution, by preserving or augmenting natural resources, and by safeguarding the State's unique natural environmental characteristics in a manner which will foster and promote the general welfare, create and maintain conditions under which humanity and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of the people of Hawaii.***

The project would be consistent with this environmental policy because the improvements would utilize existing land and open space area within the owner's property. These improvements will be designed and constructed to minimize effects on natural resources, control pollutants discharge during construction by implementing best management practices, and include review and approval by pertinent regulatory agencies. This project would not have an adverse impact on natural resources or the environment as discussed in the various sections of this document.

The conceptual site plan requires minimal grading by maintaining the existing slopes and

eliminates the need for extensive grading. Design of this project will protect and safeguard the unique natural environment and characteristics associated with this project area. The shoreline structures would meet all applicable Federal, State and City building requirements and regulations to protect the environment. Best management practices would be implemented during construction to minimize runoff and other short-term impacts such as fugitive dust and noise. Therefore, this project will conserve natural resources such as open space lands, and is not anticipated to significantly impact the shoreline and the ocean waters beyond.

Guidelines

(2) Land, water, mineral, visual, air, and other natural resources

(A) Encourage management practices which conserve and fully utilize all natural resources;

(E) Establish and maintain natural area preserves, wildlife preserves, forest preserves, marine preserves, and unique ecological preserves.

The shoreline project will be consistent with these guidelines because the improvements would not impact those natural resources identified such as watersheds, forest preserves, wildlife preserves, or unique ecological preserves. The project would not have an adverse impact on areas that are valuable open spaces since the property is located in an existing residential community. Appropriate measures would be incorporated into the project's design to minimize erosion and address appropriate drainage requirements to help conserve and protect natural resources.

(3) Flora and fauna

(A) Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard.

B. Foster the planting of native as well as other trees, shrubs, and flowering plants compatible to the enhancement of our environment.

As discussed in Chapter 3 of this document, no known endangered plant species have been identified in or near the project site. Birds, mammals, reptiles, and amphibians that may frequent the project site are expected to be alien or indigenous species that are commonly found in urban residential environments. Fauna species present within the project site are not expected to be negatively affected since development of this project should not drastically alter the existing environment. Input received as part of the consultation process will help identify any protective practices to be implemented. This project will not introduce new plants or animals to the area, which may have an ecological hazard.

(4) Parks, recreation, and open space

(A) Establish, preserve and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses.

(B) Protect the shorelines of the State from encroachment of manmade improvements, structures, and activities.

(C) Promote open space in view of its natural beauty not only as a natural resource but as an ennobling, living environment for its people.

The project is not expected to impact significant historic properties or cultural resources and practices as discussed in Chapter 3 since there are no known sites present or traditional cultural practices affected by the project. The project site is located within a residential lot, and will have a positive impact on existing public and recreational uses within the crater. Based on the alternatives considered by the owner, the project provides the most protection of the shoreline from encroachment of manmade improvements, structures and activities. The project will improve accessibility and enjoyment of the open space and natural environment of the area by allowing the owner safe access to Kāneʻohe Bay. The proposed shoreline improvements would not adversely impact any recreational area or scenic visual resources along the shoreline due to the topography of the site.

5. Citizen participation

(A) Provide for expanding citizen participation in the decision making process so it continually embraces more citizens and more issues.

The environmental review process undertaken for this project allows for public and government agency input of concerns and comments associated with the project. Such opportunities include pre-assessment consultation and review of the Draft EA. Thus, the public consultation process incorporated within this environmental review process provides decision-makers with a diverse array of information to consider in evaluating this project.

6.3 CITY AND COUNTY OF HONOLULU GENERAL PLAN

This section discusses the projects conformant with pertinent objectives and policies form the City and County of Honolulu General Plan. The Plan is a comprehensive statement of objectives and policies which sets forth the long-range aspirations of Oʻahu's residents and the strategies of actions to achieve them.

Population

1. Objectives

C. To establish a pattern of population distribution that will allow the people of Oʻahu to live and work in harmony.

2. Policies

A. Manage physical growth and development in the urban-fringe and rural areas so that: a) An undesirable spreading of development is prevented; and 2) Their population densities are consistent with the character of development and the environmental qualities desired for such areas.

The project would be consistent with these objectives and policies since it would not increase the resident population in the Koʻolaupoko District or affect the island-wide resident population

distribution percentages. Implementation of the proposed improvements will simply provide better permanent protection of the property's shoreline and allow the owner safety access the ocean.

Natural Environment

1. Objectives

A. To protect and preserve the natural environment.

B. To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.

2. Policies

A. Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development.

B. Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation.

C. Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.

D. Protect the natural environment from damaging levels of air, water, and noise pollution.

E. Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu.

F. Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams, shoreline, fishponds, and bays; and reefs and offshore islands.

G. Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas.

J. Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea.

The project will comply with all of these objectives and policies. The impact of the proposed improvements on the surrounding natural environment would be positive in general. Scenic views associated with the Ko'olaupoko District would not be affected. Except for minimal construction-related impacts, there will be no air, water or noise impacts from this project.

As discussed in Chapter 3, construction-related disturbances to the environment will be minimal and short-term. Virtually all areas that will be disturbed would be located within the shoreline setback area, thus ensuring minimal if any impact on natural areas and important habitats. This project is not an incompatible development with the surrounding natural environment since it only involves minimal improvements to the shoreline area. The site is absent of distinctive land forms, does not involve a water recharge area, and absent of significant or important vegetation.

The project will be designed to comply with all pertinent flood requirements. Minimal improvements are needed to address surface drainage at the site. However, this change would not cause significant changes to surface drainage in the area and existing drainage patterns will be maintained.

As discussed in the various sections of this document, the project is not expected to have a significant impact on the natural environment or plants, birds, or other animals unique to the island and State. No mature trees would be affected by this project and well-known resources will be affected. The main effects associated with this project would be construction related. However, best management practices and other design measures will be incorporated to mitigate the short-term nuisances caused by construction activities. Scenic views would not be adversely impacted by the project since there are no scenic resources or landmarks on the project site nor are there any significantly important viewing locations along the highway affected by this project as discussed in Chapter 3.

Culture and Recreation

1. Objectives

A. To protect Oahu's cultural, historic, architectural, and archaeological resources.

D. To provide a wide range of recreational facilities and services that are readily available to all residents of O'ahu.

2. Policies

A. Encourage the restoration and preservation of early Hawaiian structures, artifacts, and landmarks.

B. Identify, and to the extent possible, preserve and restore buildings, sites, and areas of social, cultural, historic, architectural, and archaeological significance.

C. Provide convient access to all beaches and inland recreation areas.

D. Provide for safe and secure use of public parks, beaches, and recreation facilities.

E. Encourage the safe use of O'ahu's ocean environments.

As discussed in Chapter 3, the project is not expected to impact cultural, historic, architectural, or archaeological resources. Coordination with State Historic Preservation Division (SHPD) will be conducted through this environmental assessment process. In the event of a burial encounter during construction, all work would stop and SHPD would be notified.

The project will not significantly impact coastal resources having recreational value in a negative manner as documented in this document. The proposed improvements would not restrict lateral access of the shoreline nor would it eliminate public access to the shoreline fronting the property, and would not prevent or adversely affect current public recreational activities occurring along this shoreline.

6.4 CITY AND COUNTY OF HONOLULU LAND USE ORDINANCE, ROH CHAPTER 21

Since the project is within the State Urban District, it is under the jurisdiction of the City and therefore subject to the rules and regulations of the City's Land Use Ordinance (LUO). The project site is zoned R-10, Residential, by the City and County of Honolulu.

According to the LUO, the purpose of the residential district is to allow for a range of residential densities. The intent of R-10 districts is to provide areas for large lot developments typically located at the outskirts of urban development requiring a minimal lot area of 10,000 square feet. Permitted uses and development standards within the R-10, Residential District are provided in Table 21-3, and Table 21-3.2, LUO, respectively. Design of the single-family dwelling and shoreline improvements is being prepared in accordance will the rules set forth for the R-10, Residential District.

6.5 KOʻOLAUPOKO SUSTAINABLE COMMUNITIES PLAN

This section discusses the project's conformance with key elements of the vision and land use policies, and guidelines for the *Koʻolaupoko Sustainable Communities Plan* (DPP, 2000). The plan was adopted by the City Council to provide conceptual, long-range guidance for decision-makers through the year 2020. The vision of the Koʻolaupoko Sustainable Communities Plan is oriented toward maintaining and enhancing the region's ability to sustain its unique character and lifestyle.

The Plan's vision is formed around two principal concepts. First, it is the Plan's vision to protect the communities' natural, scenic, cultural, historic, and agricultural resources. And second, to address the need to improve and replace, as necessary, the region's aging infrastructure system. Furthermore, the Plan provides general policies related to land use concerns and goals for the region. The general policies applicable to this project are provided below along with a discussion of the project's consistency with each policy.

As discussed in Chapter 1, the proposed project is located within the Rural Community Boundary with a Low-Density Residential land use designation. The proposed project and single-family residence would be consistent with this designation.

General Policies

1. Open Space Preservation

1. *Protect scenic views, provide recreation and promote access to shoreline and mountain areas.*
2. *Define the boundaries of communities and provide buffers between agricultural uses, residential neighborhoods and other uses.*
3. *Create a system of linear greenways along roadways and drainage ways.*
4. *Prevent development in areas susceptible to landslides and similar hazards.*

Because the property is already situated along the shoreline, this development cannot avoid

being located within a coastal area. However, appropriate design measures will be implemented to allow the proposed shoreline improvements to be sensitive and compatible with the shoreline environment. The project would not adversely impact areas of scenic beauty and will not impact open space. Chapter 3 of this document discusses the project's effect on open space and scenic beauty in more detail.

2. Historic and Cultural Resources

1. *Emphasize physical references to Koolaupoko's history and cultural roots.*
2. *Protect existing visual landmarks and support creation of new, culturally appropriate landmarks.*
3. *Preserve significant historic features.*
4. *Retain significant vistas associated with archaeological features.*

The project is not expected to impact significant historic properties or cultural resources and practices as discussed in Chapter 3 of this document. Thus, restoration of sites would not apply since there are no known to be affected. However, in the event subsurface historic sites such as cultural layers or human burial are encountered during construction, all work would stop and the SHPD would be notified. Furthermore, the project site has been previously disturbed from construction of a previous residential structure. Therefore, the project would be consistent with these policies addressing historic and cultural resources.

6.6 SHORELINE SETBACK ORDINANCE, ROH CHAPTER 23

The proposed project requires compliance with the City's Shoreline Setback Ordinance (Chapter 23, ROH). The purpose of the ordinance is "to protect and preserve the natural shoreline, especially sandy beaches; to protect and preserve public pedestrian access laterally along the shoreline and to the sea; and to protect and preserve open space along the shoreline." The shoreline setback area is defined as all the land area between the certified shoreline and shoreline setback line. The shoreline setback line is established 40-feet inland from the certified shoreline. Structures are not permitted in the shoreline setback area without a variance, and approved variances must meet the following conditions (ROH §23-1.9):

(a) To maintain safe access to and along the shoreline or adequately compensate for its loss;

(b) To minimize risk of adverse impacts on beach processes;

(c) To minimize risk of existing legal or proposed structures falling and becoming loose rocks or rubble on public property; and

(d) To minimize adverse impacts on public views to, from and along the shoreline.

Per Ordinance requirements, the City requires that new subdivisions must accommodate a 60-foot shoreline setback; however, the project parcel has not been recently subdivided. Therefore, a 60-foot shoreline setback would not be required.

Hardship Standards

According to ROH §23-1.8(b)(3)(A), the proposed improvements within the shoreline setback area must be necessary to provide "reasonable use of the land" before a "hardship" variance can be granted. The proposed improvements would be required to meet the following "hardship standards." Application of these hardship standards to the project will be addressed in the owner's ensuing application for a Shoreline Setback Variance.

i) The applicant would be deprived of reasonable use of the land if required to comply fully with the shoreline setback ordinance and the shoreline setback rules;

(ii) The applicant's proposal is due to unique circumstances and does not draw into question the reasonableness of this chapter and the shoreline setback rules; and

(iii) The proposal is the practicable alternative which best conforms to the purpose of this chapter and the shoreline setback rules.

The Ordinance identifies prohibited structures and activities within the shoreline setback area with exceptions including "minor structures and activities" allowed by the department which do not affect beach processes or artificially fix the shoreline and do not interfere with public access, public views or open space along the shoreline. If necessary, a Minor Shoreline Structure Permit will be pursued by the applicant.

6.7 COASTAL ZONE MANAGEMENT PROGRAM, HRS 205A

The entire property and project area is located within the City and County of Honolulu's Special Management Area (SMA). The intent of the SMA Permit is to regulate any use, activity or operation that is defined as a "development" within the SMA. According to HRS §205A-22 and ROH §25-1.3(2)(N), the definition of "development" does not include construction of a single family residences and ancillary structures. Therefore, this project is exempt from the requirement to obtain a SMA development permit.

As discussed below, the proposed project will be consistent with the following objectives, policies, and guidelines of the Special Management Area, set forth in Chapter 205A-2, HRS. A discussion of this project's conformance and consistency with the various applicable policies developed for each objective is provided.

A. Objectives:

1. Provide coastal recreational opportunities accessible to the public.

2. Protect, preserve, and where desirable, restore those natural and man-made historic and pre-historic resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

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

4. Protect valuable coastal ecosystems from disruption and minimize adverse impacts on all coastal ecosystems.

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

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

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

8. Protect beaches for public use and recreation.

The project would be consistent with these objectives. The proposed shoreline improvements would not restrict public access to the shoreline from mauka areas nor would it restrict lateral shoreline access. Implementation of these improvements are expected to have an overall positive impact on the quality of coastal and open space resources by reducing the amount of erosion and sediment entering Kāneʻohe Bay which is one of the State's most valuable marine resources. Furthermore, implementation of these improvements would reduce the hazard risk to life and property from tsunami, erosion and ground subsidence.

B. Policies

1. Recreational resources:

b. Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by;

i. Protecting coastal resources uniquely suited for recreation activities that cannot be provided in other areas;

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

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

vi. Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters.

The project will not significantly impact coastal resources having recreational value, specifically Kāneʻohe Bay and its recreational uses. The project would be located on already designated residential lot and limited to the shoreline setback area within the property boundaries. Therefore, it would not eliminate public access to the shoreline fronting the property, and would not prevent or adversely affect current public recreational activities occurring along this shoreline.

Construction of the project will not involve extensive land disturbance activities since grading activities should be minimal due to selection of the preferred alternative. Construction activities will be short-term, and appropriate best management practices developed to address surface water runoff. Construction plans would be coordinated with pertinent State and City agencies for review and approval. As a result, construction is not expected to generate significant amounts of pollutants which may affect the water quality of the surrounding shoreline area.

2. Historic Resources:

a. Identify and analyze significant archaeological resources;

c. Support state goals for protection, restoration, interpretation, and display of historic resources.

As discussed in this Chapter 3, the project will not have an adverse impact on historic properties or significant cultural resources since there are none known to be present on the project site and immediate area. Furthermore, the project site has been previously disturbed from construction of a previous residential structure. Appropriate coordination will be conducted with the State Historic Preservation Division to address the potential impacts on historic properties and implement appropriate mitigative measures, if necessary.

Further, there are no known significant cultural resources on the project site or immediate areas, and the project will not restrict access to adjacent areas that may be used for traditional native Hawaiian practices or cultural activities. Therefore, the project would be consistent with these policies addressing historic resources.

3. Scenic and Open Space Resources:

a. Identify valued scenic resources in the coastal zone management area;

b. Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;

c. Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources.

There are no significant visual resources situated on the project site that would be affected by the project nor are anticipated negative impacts to significant coastal views from Kamehameha Highway. This project would not alter any significant natural landforms or obstruct existing public views of the shoreline and scenic resources. Thus, the project would not impact the visual character of the development or affect open space and scenic resources.

4. Coastal Ecosystems:

b. Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

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

d. Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate State water quality standards.

The project would not adversely impact valuable coastal ecosystems since it would only be limited to construction of the proposed shoreline improvements on the relatively small site within residential lot. It would not involve stream diversions, channelization, or other similar alterations to existing water uses or coastal ecosystems. During construction, disruption or degradation of coastal waters will be minimal or non-existent as contractors will be required to follow applicable rules and regulations governing erosion and runoff. Best management practices will be implemented by the contractor, and design plans will be submitted to State and City agencies for review and approval. Consequently, the proposed project will not negatively impact water quality or marine ecosystems in the immediate vicinity.

5. Economic Uses:

The policies pertaining to Economic Uses are not applicable for this project since the building is not a coastal dependent development.

6. Coastal Hazards:

b. Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and non-point pollution hazards;

c. Ensure that developments comply with requirements of the Federal Flood Insurance Program; and

d. Prevent coastal flooding from inland projects.

Construction of the proposed project will not result in any disruption to existing stream flows or activities within existing flood hazard areas. The project's design will comply with flood district requirements specified under the *LUO.*

7. Managing Development:

a. Use, implement, and enforce existing law to the maximum extent possible in managing present and future coastal zone development;

b. Facilitate timely processing of application for development permits and resolve overlapping or conflicting permit requirements; and

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

The owner will comply with City regulations and requirements by submitting a Shoreline Setback Variance application to the City with supporting documentation. This application will include information addressing the proposed project's potential impact on the environment, which should be minimal and consist mainly of short-term construction related effects due to the nature of this project. This Environmental Assessment document provides more detailed discussion addressing the project's impact on the environment.

8. Public Participation:

b. Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal-related issues, developments, and government activities.

The owner is complying with this policy through the publication and distribution of this Environmental Assessment document. The processing of this document allows for public participation to address comments and concerns associated with the project. The owner will also comply with this policy through submittal of an application for Shoreline Setback Variance for the proposed project. This application would allow the City's Department of Planning and Permitting to review the project's consistency with coastal management policies.

9. Beach Protection:

a. Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion.

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

The preferred alternative was selected based upon its minimal impacts to the shoreline. The proposed improvements do not include the development of any erosion protection structures to be located seaward of the shoreline. Thus, the project would not interfere with existing recreational and waterline activities conducted in Kāne'ohe Bay. The proposed project promotes an overall conservation ethic since it will eliminate erosion and sediment from entering the shoreline and bay. Further, the project will not involve the use or development of marine and coastal resources. Therefore, the project is not expected to have a negative impact on marine and coastal resources and would thus be consistent with these policies.

CHAPTER 7
CONSULTATION EFFORTS

Consultation with various government agencies has been conducted for this project as part of the pre-assessment consultation process in preparing this document. Such efforts consisted of distributing solicitation letters to several agencies to obtain their input and comments on the project identifying issues which should be addressed. These consultation efforts are discussed in this Chapter, and copies of comments received are included in Appendix B of this document.

7.1 DRAFT EA PRE-ASSESSMENT CONSULTATION

Consultation with various Federal, State, and County government agencies was conducted to obtain their comments and concerns associated with the project as part of the environmental assessment process. Letters providing project information along with a location map was sent to these parties in June 2008 for their review.

A listing of agencies and organizations for which consultation letters were sent is provided below. Those providing written response are identified with a "**»**" symbol. Copies of their written comments received along with responses are included in Appendix B.

Federal Agencies

» Department of Agriculture, Natural Resources Conservation Service
» Department of the Army, U.S. Army Engineer Division, Honolulu
- Department of the Army, U.S. Army Support Command Hawai'i
- Department of the Interior, Fish and Wildlife Service, Pacific Islands Region
- Department of the Interior, Water Resources Division, U.S. Geological Survey

State of Hawai'i Agencies

» Department of Accounting and General Services
- Department of Business, Economic Development & Tourism
» Department of Education
- Department of Hawaiian Home Lands
- Department of Health, Environmental Planning Office
» Department of Land and Natural Resources
- Department of Land and Natural Resources, State Historic Preservation Division
- Dept. of Business, Economic Development & Tourism, Coastal Zone Management
- Dept. of Business, Economic Development & Tourism, Land Use Commission
- Dept. of Business, Economic Development & Tourism, Office of Planning
» Office of Hawaiian Affairs
» Department of Transportation

City and County of Honolulu Agencies

- Department of Community Services
- Department of Design and Construction
- Department of Environmental Services
- Department of Facility Maintenance
- Department of Parks and Recreation
- Department of Planning and Permitting
- Department of Transportation Services
- Honolulu Fire Department
- Honolulu Police Department
- Board of Water Supply

Community Groups

- Council Member Todd Apo, City Council
- Kahaluʻu Neigborhood Board No. 29

Early Consultation meeting with Department of Planning and Permitting

An early consultation meeting was held with planners of DPP's Land Use Permits Division. A preliminary site plan showing a terracing of three retention walls and seawall was presented for discussion and comment. In summary, the meeting prompted the owner to consider additional alternatives which would have less impact on the shoreline.

Kahaluʻu Neighborhood Board Meeting

A presentation on the proposed shoreline improvements was made to the Kahaluʻu Neighborhood Board No. 29 on August 13, 2008 as part of the early consultation efforts. A summary of the meeting and comments received is provided. A short briefing on the purpose for the presentation and background of the project was made to the Board. Presentation boards were used to describe the project and proposed improvements. After this presentation, questions from the Board and the general public were taken.

1) A Board member asked whether the seawall would follow the pre-erosion topography. It was explained that the proposed improvements would not attempt to recapture land already lost to erosion.

2) A Board member asked what the effects were on the neighboring residents. The owner has consulted with the adjacent property owner who is considering a seawall. And the home on the other side already has a seawall.

3) A Board member noted that the project area has cultural significance as a lawaiʻa (fishing) ahu and also has moʻolelo associated with it. She suggested a Hawaiian blessing should be considered prior to construction. Owner will continue to follow up with the Board member to ensure cultural issues are addressed in the EA process.

3) A Board member noted that constructing a seawall would reduce the amount of sediment entering near shore waters, increasing wave energy.

4) A Board member asked about reef protection while Chair Henkin read a Hawaii Revised Statutes section pertaining to shoreline variance. J. Chang said the wall will change the shoreline; however, the EA will address why the wall was needed.

5) A Board member noted the property is often referred to as Butler's Corner or Perry's Point.

CHAPTER 8
FINDINGS AND ANTICIPATED DETERMINATION

To determine whether a proposed action may have a significant effect on the environment, the Approving Agency needs to consider every phase of the action, the expected primary and secondary consequences, cumulative effect, and the short- and long-term effects. The Approving Agency's review and evaluation of the proposed action's effect on the environment would result in a determination either: 1) the action would have a significant effect on the environment, and an Environmental Impact Statement Preparation Notice should be issued, or 2) the action would not have a significant effect warranting a Finding of No Significant Impact (FONSI).

8.1 PRELIMINARY FINDINGS

This section discusses the results of the assessment conducted for the project in relation to the 13 Significance Criteria prescribed under the State Department of Health's Administrative Rules Title 11, Chapter 200. The purpose of this assessment was to consider the "significance" of potential environmental effects which includes the sum of effects on the quality of the environment along with the overall and cumulative effects." The resulting findings are discussed below for each criterion.

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.

The proposed improvements would not result in the irrevocable commitment to loss or destruction of any natural or cultural resource. As discussed in Chapter 2 of this Draft EA, the improvements are intended to provide protect the owner's life and property. The proposed improvements would be constructed on an previously developed residential lot. Thus, there would be no destruction or loss of any significant, endangered, or threatened botanical, faunal, geological, or other natural resources.

In terms of archaeological and historic resources, there are no known historic or culturally significant sites within or surrounding the project site. In the event subsurface human remains or other indications of human activity older than 50 years are encountered during construction activities, all work would stop immediately and the SHPD notified. The treatment of human remains encountered would be determined and conducted in accordance with the applicable requirements of Chapter 6E, HRS, and Chapter 13-300, Hawaii Administrative Rules.

The project would also not restrict access to surrounding areas that may be potentially used for traditional native Hawaiian cultural practices. This project would not prevent access to shoreline areas or surrounding mauka areas that may be used for traditional gathering or other cultural practices.

2. Curtails the range of beneficial uses of the environment.

The project would not curtail the range of beneficial uses of the environment at the project site. The area is designated for residential use by State and City land use policy guidelines and has been used for as a residential lot for many years. Therefore, the improvements planned would not change the existing uses of such lands or surrounding lands and will not limit or significantly impact existing uses or the surrounding environment.

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 improvements proposed under this project would not conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS. This Draft EA addressed the probable environmental impacts associated with the project, which would be primarily associated with short-term construction activities.

4. Substantially affects the economic or social welfare, cultural practices of the community or State.

As discussed under Chapter 4, the project would not have any significant negative impacts on the economic structure of the Koʻolaupoko District, or the social welfare of the Kahaluʻu community. The project would create a short-term, minor economic benefit generating construction jobs and personal income for local construction workers. As a result, there should be no negative impact or change to the overall character of the community. In terms of cultural practices, there are no known cultural resources at the project site or traditional native Hawaiian cultural practices occurring within the project area. Consequently, the proposed project is not expected to have an impact on the social welfare, cultural resources or traditional cultural practices of the Kahaluʻu community or State.

5. Substantially affects public health.

The project is not expected to substantially affect public health since it would involve improvements to the residential lot. The proposed project would address public health by implementing applicable mitigation measures to curtail the impacts of noise, dust, and construction activities in the shoreline area.

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

The project should not have any secondary impacts on the social environment or infrastructure and public facilities. The project strictly involves only construction of accessory shoreline improvements, and does not include the addition of new residential housing or visitor accommodations. Therefore, there would not be any elements of the project contributing to in-migration of residents or additional visitors to the island. The project would

also not significantly impact other existing infrastructure facilities or public facilities in the immediate area due to the type of improvements being proposed as discussed under Chapter 2 of this Draft EA.

7. Involves a substantial degradation of environmental quality.

The proposed project would not involve a substantial degradation to the quality of the surrounding environment. As proposed, construction activities would be performed on already urbanized areas, and necessary measures would be implemented during construction to minimize erosion and other short-term impacts. An overall positive impact is expected to result from this project due to the reduction of erosion occurring at the project site and entering Kāneʻohe Bay.

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

Environmental impacts associated with these improvements were addressed in this document, and are mainly associated with construction activities. Thus, the cumulative impacts of these improvements were considered in assessing environmental impacts, and it was determined that the project would not have a significant effect on the environment. This project does not involve the commitment for larger actions in the Kahaluʻu community.

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

There are no known endangered, threatened, or rare botanical resources on the project site, or faunal and avifaunal species inhabiting the area which may be affected by construction activities or the completion of the proposed improvements. Necessary control measures and best management practices would be implemented to minimize runoff and other potential short-term impacts associated with construction activity. Thus, the project is not expected to substantially affect rare, threatened, or endangered species or potential habitat for such species.

10. Detrimentally affects air or water quality or ambient noise levels.

The project should not have a detrimentally significant impact on air, water quality, or ambient noise levels. Impacts associated with these factors would be limited to short-term construction activities. However, such impacts are expected to be minor due to the relatively minor amount of grading proposed. To further minimize impacts, construction activities would be subject to applicable State regulations as discussed under Chapter 3.

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 within an environmentally sensitive flood plain nor is it situated within a tsunami inundation zone, erosion-prone area or geologically hazardous area. However, the project area is subject to increased erosion due to its location within a shoreline almost completely armored by seawalls.

12. Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.

As discussed in Chapter 3, the proposed shoreline improvements would not have a significant negative impact on affect scenic vistas or viewplanes. Construction of this project is thus expected to have minimal or no effect on visual resources or public viewing points.

13. Requires substantial energy consumption.

The project would not require electrical facilities. Thus, the proposed action does not require consumption of energy.

8.2 ANTICIPATED DETERMINATION

Based upon the result of the environmental assessment documented in this Draft EA, a Finding of No Significant Impact (FONSI) determination is anticipated for this Project. The findings supporting this anticipated determination are based upon the previous discussion of the project's affect on the environment in relation to the 13 Significance Criteria.

CHAPTER 9
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APPENDICES

APPENDIX A

Photos of Project Site and Surrounding Areas

Appendix A - Photos

Photo 1-Northeast view. Concrete debris visible on left side.

Photo 2-East view. Concrete debris (stairs and wall) visible in center.

Photo 3-Southwest view. Portion of concrete debris visible.

Photo 4- Northwest view of adjacent property.

Photo 5-West view along Kamehameha Highway. Property fence visible on right.

Photo 6-East view along Kamehameha Highway from edge of property.

Appendix A - Photos

Photo 7-North view from top of bank within 40- shoreline setback area.

Photo 8- Close-up view of concrete debris located in shoreline setback area.

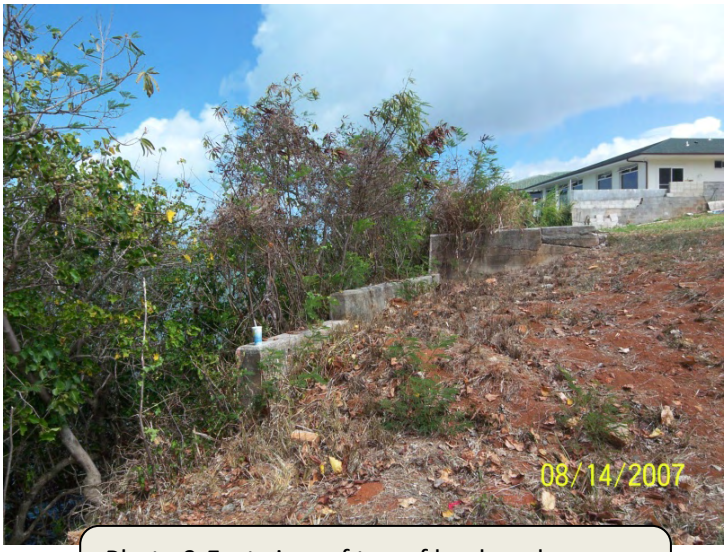

Photo 9-East view of top of bank and concrete debris.

Photo 10-View from sea level showing shoreline conditions during low tide.

Photo 11-Shoreline conditions fronting property during low tide.

Photo 12-View of slope leading to shoreline.

Appendix A - Photos

Photo 13-East view along shoreline.

Photo 14- View of slope conditions.

Photo 15-East view of erosion and soil slippage at top of bank.

Photo 16-West view of erosion and soil slippage at top of bank.

Photo 17-East view showing end of adjacent property's seawall.

Photo 18-View of seawall at adjacent property.

Appendix A - Photos

Photo 19-East view along shoreline and neighboring properties.

Photo 20-View of slope erosion from sea level.

Photo 21- Neighboring property seawall and structures.

Photo 22-North view of project site from across Kamehameha Highway.

Photo 23-Neighboring property seawalls and structures.

Photo 24-East view of shoreline areas immediately south of project site.

APPENDIX B

Early Consultation Comments And Responses

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
P.O. Box 50004 Rm. 4-118
Honolulu, HI 96850
808-541-2600

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July 16, 2008

Jared K.Chang, Project Planner
SSFM International, INC
501 Sumner Street, Suite 620
Honolulu, HI 96817

Subject: USDA- NRCS Review of the Draft Environmental Assessment for the Meyers Residence, District of Kahalu`u, Island of Oahu, Hawaii.

Dear Mr. Chang,

Thank you for providing the USDA-Natural Resources Conservation Service (NRCS) the opportunity to review the Draft Environmental Assessment for the Meyers Residence, District of Kahalu`u, Island of Oahu, Hawaii.
In review of the project site location it was found that no Prime or Important Farmlands exist or will be impacted at this site. In addition, no hydric soils are located in the project area. Hydric soils identify potential areas of wetlands. If wetlands do exist, any proposed impacts to these wetlands would need to demonstrate compliance with the "Clean Water Act", and may need an Army Corp of Engineers 404 permit.

Please find enclosed the NRCS Soil Survey Map and selected soil reports. The Soil Survey Map identifies soil map unit KtC in the project area. The soil reports provide selected soil properties and interpretations, e.g., dwellings w/o basements, soil layers with USDA textures, and engineering classifications. The limitation rating for dwellings w/o basements is moderate due to the 8 to 15 percent slopes. These ratings do not preclude the intended land use, however they do identify potential limitations for the use, which may require corrective measures, increase costs, and/or require continued maintenance.

The NRCS Soil Survey is a general planning tool and does not eliminate the need for an onsite investigation. If you have any questions concerning the soils or interpretations for this project please call, Tony Rolfes, Assistant State Soil Scientist, (808) 541-2600 x129, or email, Tony.Rolfes@hi.usda.gov.

Sincerely,

LAWRENCE T. YAMAMOTO
Director
Pacific Islands Area

cc: Michael Robotham, Assistant Director for Soil Science and Natural Resource Assessments, USDA-NRCS, Honolulu, HI

Enclosures:

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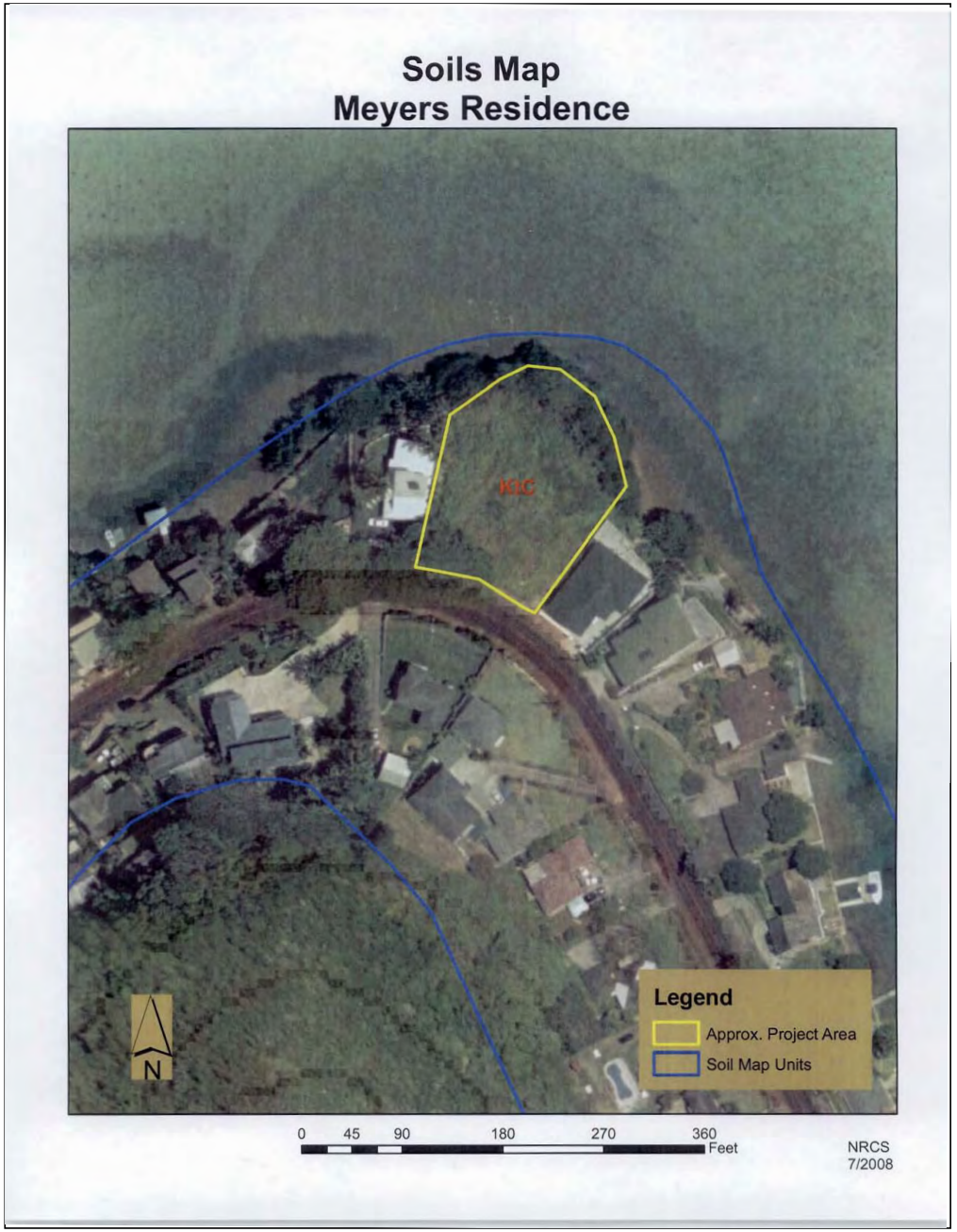

Map Unit Legend

Island of Oahu, Hawaii

Map symbol	Map unit name
KtC	Kokokahi clay, 6 to 12 percent slopes

Selected Soil Interpretations

Island of Oahu, Hawaii

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

*This soil interpretation was designed as a "limitation" as opposed to a "suitability". The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation.

Map symbol and soil name	Pct. of map unit	ENG - Dwellings W/O Basements (HI) *	
		Rating class and limiting features	Value
KtC:			
Kokokahi	100	Moderate	
		Slopes 8 to 15%	0.15

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Island of Oahu, Hawaii

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
KIC:							
Kokokahi	100	Very limited		Very limited		Very limited	
		Low strength	1.00	Too clayey	1.00	Too clayey	1.00
		Shrink-swell	1.00	Cutbanks cave	1.00	Slope	0.04
		Slope	0.04	Slope	0.04	Large stones content	0.01

Water Features

Island of Oahu, Hawaii

Map symbol and soil name	Hydrologic group	Surface runoff	Month	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
KIC:										
Kokokahi	D	Medium	Jan-Dec	---	---	---	---	None	---	None

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Lawrence T. Yamamoto, Director
Pacific Islands Area
Natural Resources Conservation Service
United States Department of Agriculture
P.O. Box 50004 Rm. 4-118
Honolulu, HI 96850

Dear Mr. Yamamoto:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 16, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that no Prime or Important Farmlands exist or will be impacted at this site and no hydric soils are located in the project area. Thus, we anticipate no wetlands will be impacted by this project. A geotechnical engineering assessment was conducted for the project and is included in the Draft EA. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

SSFM INTERNATIONAL, INC.
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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

HRD08/1091

July 24, 2008

Jared Chang, Planner
SSFM International, INC.
501 Summer Street, Suite 620
Honolulu, Hawai'i 96817

RE: Request for comments on the proposed Meyer draft environmental assessment (DEA) and shoreline setback variance, Kahalu'u, O'ahu, TMKs: 4-7-19:50 and 51.

Aloha e Jared Chang,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated July 7, 2008. OHA has reviewed the project and offers the following comments.

Generally OHA is not supportive of either shoreline setback variances or seawalls for a variety of reasons. In this instance OHA notes that the property owner is in possession of two adjacent lots in which to build the one residence. This renders the property with more flexibility than the property would otherwise have. OHA also notes that both lots are presently undeveloped, presenting a blank slate from which to design the residence. As such, we see this property as being at an advantage with more, not less reasonable use.

OHA urges that the owner consider a landward retreat from this dynamic shoreline. OHA sees in the limited materials sent to us that the mature trees on the property have already begun to fall into the sea as the shoreline retreats. With the reality of sea level rise this will only worsen. Therefore, OHA generally advocates for a strengthening of our shoreline setback policies and not variances from it.

OHA also notes that the applicant proposes to plant shrubs within the shoreline setback. OHA is concerned with the potential loss of the public shoreline that this proposal contains. Shoreline encroachment from property owners who do not maintain their plantings is a universal

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problem in this state and one that the Office of Conservation and Coastal Lands recently took up in Kahala. OHA would like to prevent this from occurring on this subject property. We note that the property is on a peninsula of Kāneʻohe Bay and that the shoreline is exposed at some tidal stages.

This raises concerns for us regarding the potential use of this are by our beneficiaries for their constitutionally protected traditional and customary practices that may occur in this ceded lands and public trust area. We look forward to reviewing the DEA in this regard as well.

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold at (808) 594-0263 or e-mail him at granta@oha.org.

ʻO wau iho nō me ka ʻoiaʻiʻo,

Clyde W. Nāmuʻo
Administrator

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 8, 2009

SSFM 2007_043.000

Mr. Clyde W. Nāmu'o, Administrator
State of Hawai'i
Office of Hawaiian Affairs
711 Kapi'olani Boulevard, Suite 500 Street
Honolulu, Hawai'i 96813

Dear Mr. Nāmu'o:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 24, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note your concerns regarding shoreline structures and shoreline setback variances and recognize your department's position on the issue of strengthening shoreline setback policies rather than allowing variances from those regulations.

We confirm that landscaping is an integral part of the project and equally important is the proper establishment of appropriate plants and regular maintenance of these plants by the owner. Use of native shrubs such as *Naupaka kahakai*, is proposed for the landscaping within the shoreline setback area.

Proposed improvements are likely to have a minimal impact, if any, on the traditional and cultural practices which may occur in the vicinity of the project site. The Draft EA addresses these concerns. The preferred alternative does not involve a seawall and is expected to generate minimal impact among the build alternatives considered. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

LINDA LINGLE
GOVERNOR

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

SSFM INTERNATIONAL, INC
RECEIVED
JUL 29 2008
JKC
FILE

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

HWY-PS
2.8695

July 28, 2008

Mr. Jared K. Chang
Project Planner
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Pre-Assessment Consultation for Draft Environmental Assessment (Draft EA) and Shoreline Setback Variance for Meyer Residence
Oahu, Koolaupoko District, Kahaluu, TMK: (1) 4-7-019: 50 and 51

Thank you for consulting us on the subject project. We have the following comments:

1. The Draft EA should discuss and evaluate the project impacts on our highway facilities, such as but not limited to:

   (a) traffic generated by the project

   (b) during construction
   (i) vehicle and equipment type that will be used at the job site
   (ii) duration of lane or road closures during project working hours
   (iii) inconvenience to the motoring public

   (c) consideration that we have a future bikeway planned on that portion of Kamehameha Highway.

If there are any questions, please contact Ken Tatsuguchi, Head Planning Engineer, Highways Division, at (808) 587-1830.

Very truly yours,

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

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SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Brennon T. Morioka, Director
State of Hawai‘i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai‘i 96813

Dear Mr. Morioka:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu‘u, Island of O‘ahu, Hawai‘i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 28, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

Information on the project’s effect on Kamehameha Highway will be addressed. Available information on the type of vehicles and projected volumes entering and exiting the project site will be included in the Draft EA. We note a future bikeway is planned for the portion of Kamehameha Highway fronting the project site. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
AUG 12 2008

Corr OA-09-11

AUG 11 2008

REF:OCCL:MC

Jared K. Chang
SSFM International
501 Sumner Street, Suite 620
Honolulu, HI 96817

Dear Mr. Chang,

FILE COPY

SUBJECT: PRE-ASSESSMENT CONSULTATION
Meyer Residence and Shoreline Setback Variance
Kahalu`u, Ko`olaupoko, O`ahu
TMK (1) 4-7-19:50, 51

The Office of Conservation and Coastal Lands (OCCL) has reviewed the information you provided regarding the proposed residence on the above subject parcel.

The Chair of the Department of Land and Natural Resources approved a certified shoreline on August 14, 2007. The coastal parcel itself is not in the State Land Use Conservation District and is thus not subject to Conservation District land use guidelines outlined in the Hawai'i Administrative Rules (HAR) §13-5.. Any land use done makai of the certified shoreline, however, would be subject to HAR §13-5.

The plans contain a ramp leading to the shoreline, and OCCL encourages the applicant to consult with our office to determine if a Conservation District Use Permit (CDUP) would be needed for this.

We also note that this area has a dynamic shoreline, and that the current certified shoreline will expire in August 2008. It is possible that an updated survey will show that more elements of the plan, such as the 5' high retaining wall, might also fall under OCCL jurisdiction.

If you have any questions feel free to call staff planner Michael Cain at 587-0048.

Aloha,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

c: Chair

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
State of Hawai'i
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Lemmo:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated August 11, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

The subject property has received an approved certified shoreline in August 2008. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

SSFM INTERNATIONAL, INC.
RECEIVED
JUL 15 2008
ikc

FILE

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

July 14, 2008

Mr. Jared K. Chang, Project Planner
SSFM International
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang;

Subject: Pre-Assessment Consultation, Meyer Residence
Kahalu`u, Oahu, TMK: 4-7-19: 50 & 51

The Department of Education has no comment or concern about the proposed plans for the Meyer residence. Should you have any questions, please call Heidi Meeker of the Facilities Development Branch at 377-8301.

Very truly yours,

Patricia Hamamoto
Superintendent

PH:jmb

c: Randolph Moore, Assistant Superintendent, OSFSS
Duane Kashiwai, Public Works Administrator, FDB

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

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SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Ms. Patricia Hamamoto, Superintendent
State of Hawai'i
Department of Education
P.O. Box 2360
Honolulu, Hawai'i 96804

Dear Ms. Hamamoto:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 14, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that Department of Education has no comment or concern regarding to this project. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

BARBARA A. ANNIS
DEPUTY COMPTROLLER

(P)1222.8

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

SSFM INTERNATIONAL, INC
RECEIVED
JUL 16 2008
JKC
FILE

JUL 15 2008

Mr. Jared K. Chang, Project Planner
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Meyer Residence Environmental Assessment and Shoreline Setback Variance
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Keys: 4-7-019:050 and 051

Thank you for the opportunity to provide pre-assessment consultation comments for the draft environmental assessment for the proposed Meyer single-family residence at Kahaluu, Oahu. This proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer at this time.

If you have any questions, please call me at 586-0400 or have your staff call Mr. Clarence Kubo of the Public Works Division at 586-0488.

Sincerely,

RUSS K. SAITO
State Comptroller

FILE COPY

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Russ K. Saito, State Comptroller
State of Hawai'i
Department of Accounting and General Services
P.O. Box 119
Honolulu, Hawai'i 96810

Dear Mr. Saito:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 15, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that this proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and have no comments to offer at this time. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

LINDA LINGLE
GOVERNOR OF HAWAII

SSFM INTERNATIONAL, INC.
RECEIVED
OCT 17 2008
JKC
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LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

October 7, 2008

FILE COPY

LOG NO: 2008.2834
DOC NO: 0810ED08
Archaeology

Jared Chang, Project Planner
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawai'i 96817

Dear Mr. Chang:

SUBJECT: **Chapter 6E-42 Historic Preservation Review –**
Pre-Assessment Consultation for Meyer Residence Environmental Assessment and Shoreline Setback Variance
Kahalu'u Ahupua'a, Ko'olaupoko District, Island of O'ahu
TMK: (1) 4-7-019:050 & 051

Thank you for the opportunity to comment on the aforementioned project. We received the submittal on July 8, 2008 and we apologize for the delayed response. The proposed undertaking involves construction of a new single-family dwelling at the subject parcels located at 47-83 Kamehameha Highway.

At this time we do not have sufficient information to comment on the effect the proposed undertaking will have on historic resources that may exist within the project area. We suggest including within the draft Environmental Assessment a detailed description of the undertaking including proposed depth of subsurface disturbance, information pertaining to the past land use of the project area and to any known historic properties that exists within the project area with supporting documentation, including, but not limited to, historic photographs of the project area and historic literature references, and any additional information that will assist in our review of the proposed project.

We look forward to reviewing the draft Environmental Assessment.

Please contact Teresa Kaneakua-Davan at (808) 692-8015 if you have any questions or concerns regarding this letter.

Aloha,

Nancy A. McMahon

Nancy McMahon, Archaeology and Historic Preservation Manager
State Historic Preservation Division

ED

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 8, 2009

SSFM 2007_043.000

Ms. Nancy McMahon
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
601 Kamokila Boulevard, Room 555
Kapolei, HI 96707

Dear Mr. Yamamoto:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated October 7, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note you have no comments on the subject project at this time. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

KAHALUU NEIGHBORHOOD BOARD NO. 29
(Heeia Kea, Ahuimanu, Kahaluu, Waihee, Kaalaea, Waiahole, Waikane, Hakipuu, Kualoa
C/o Neighborhood Commission Office, Honolulu Hale
530 S. King Street, Rm 406, Honolulu, Hawaii 96813
Phone (808) 527-5749 • Fax (808) 527-5760 • Internet: http://www.honolulu.gov
"LET US NOT EVER HAVE AN UNHAPPY MINORITY; RATHER, LET US BUILD A COMMUNITY CONSENSUS."

July 10, 2008

Mr. Jared K. Chang
SSFM International, Inc
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

My name is David Henkin, and I am the newly elected chair of Kahalu'u Neighborhood Board No. 29.

At last night's Board meeting, former chair Amy Luersen provided me with a copy of your July 7, 2008 letter seeking input on the Draft EA for the proposed Meyer Residence (TMKs: 4-7-019:050 & 051). Under the Sunshine Law, items to be considered by the Board ordinarily must be included on our agenda, which must be published at least a week prior to the Board meeting. Since your letter was received only the day before the meeting, the Board did not have the opportunity to discuss the proposed residence and develop comments at last night's meeting and will not have an opportunity to do so until our next regularly scheduled meeting on Wednesday, August 13.

This matter will be on next meeting's agenda. In order to give the Board and other members of the community the opportunity to provide input, we would appreciate it if you would extend the deadline for initial comment until a week following that meeting. Please confirm whether you are willing to accommodate this request.

In addition, to ensure the Board and the broader community are fully apprised regarding the project proposal, we would appreciate it if you or another representative of the owner would attend our August 13 meeting to answer questions and address any concerns. Please let us know who will attend.

Thank you for your attention to this matter.

Aloha,

for David Henkin
Chair, Kahalu'u Neighborhood Board No. 29

Oahu' s Neighborhood Board system – Established 1973

FILE COPY

Jared Chang

From: Jared Chang
Sent: Tuesday, July 15, 2008 1:25 PM
To: davidlhenkin@yahoo.com
Cc: Mary Chanel-Benjamin
Subject: RE: Proposed Meyer Residence, TMKs: 4-7-019:050 & 051

David,

Thank you, we will update our mailing list and address all future correspondences to you.

Yes, we have no problems extending your pre-assessment comment deadline till August 21st, or later if necessary. However, please let me know if your Board will require additional time.

As of now, I am planning to attend your next meeting to be held on August 13. I would very much appreciate a phone call, at your convenience, so we can talk about the upcoming meeting.

Mahalo,

Jared Chang
SSFM International, Inc.
Direct: 356-1242

From: David Henkin [mailto:davidlhenkin@yahoo.com]
Sent: Thursday, July 10, 2008 1:02 PM
To: Jared Chang
Cc: Mary Chanel-Benjamin
Subject: Proposed Meyer Residence, TMKs: 4-7-019:050 & 051

Mr. Chang,

My name is David Henkin, and I am the newly elected chair of Kahalu'u Neighborhood Board No. 29.

At last night's Board meeting, former chair Amy Luersen provided me with a copy of your July 7, 2008 letter seeking input on the Draft EA for the proposed Meyer Residence (TMKs: 4-7-019:050 & 051). Under the Sunshine Law, items to be considered by the Board ordinarily must be included on our agenda, which must be published at least a week prior to the Board meeting. Since your letter was received only the day before the meeting, the Board did not have the opportunity to discuss the proposed residence and develop comments at last night's meeting and will not have an opportunity to do so until our next regularly scheduled meeting on Wednesday, August 13.

This matter will be on next meeting's agenda. In order to give the Board and other members of the community the opportunity to provide input, we would appreciate it if you would extend the deadline for initial comment until a week following that meeting. Please confirm whether you are willing to accommodate this request.

In addition, to ensure the Board and the broader community are fully apprised regarding the project proposal, we would appreciate it if you or another representative of the owner would attend our August 13 meeting to answer questions and address any concerns. Please let us know who will attend.

Thank you for your attention to this matter.

Aloha,

David Henkin

Chair, Kahalu'u Neighborhood Board No. 29

8/18/2008

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843-0001

DATE: Tuesday, July 29, 2008

PAGES TRANSMITTED: 02
(Including cover sheet)

FACSIMILE COVER SHEET

TO:

NAME: Jared Chang

COMPANY: SSFM International, Inc.

FAX NO: 521-7348

FROM:

NAME:

DIVISION:

FAX NO:

REMARKS:

IN CASE OF TRANSMISSION PROBLEMS, PLEASE CONTACT SENDER AT (808) 748-5314, THANK YOU

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

July 29, 2008

Mr. Jared K. Chang, Project Planner
SSFM International, Incorporated
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Your Letter Dated July 7, 2008 on the Draft Environmental Assessment
Pre-Assessment Consultation for the Meyer Residence, TMK: 4-7-19:50, 51

Thank you for your letter on the proposed single-family dwelling.

The existing water system is presently adequate to accommodate one single-family dwelling on the parcel. 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,

K. Shida

KEITH S. SHIDA
Program Administrator
Customer Care Division

Water for Life . . . Ka Wai Ola

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Keith S. Shida, Program Administrator
Customer Care Division
Board of Water Supply
630 South Beretania Street
Honolulu, Hawai'i 96843

Dear Mr. Shida:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 29, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that the existing water system is presently adequate to accommodate the proposed improvements.

Design plans will be coordinated with your department for review and approval as part of ministerial permits required for this project. The applicant will also pay the required Water System Facilities Charges when water is made available. Your department's cross-connection control and backflow prevention requirements will be incorporated in the project's design. A copy of the Draft EA will be provided when published.

The on-site fire protection requirements will be coordinated with the Fire Prevention Bureau for the Honolulu Fire Department.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

POLICE DEPARTMENT

CITY AND COUNTY OF HONOLULU

801 SOUTH BERETANIA STREET · HONOLULU, HAWAII 96813
TELEPHONE: (808) 529-3111 · INTERNET: www.honolulupd.org

MUFI HANNEMANN
MAYOR

BOISSE P. CORREA
CHIEF

PAUL D. PUTZULU
KARL A. GODSEY
DEPUTY CHIEFS

OUR REFERENCE BS-KP

July 21, 2008

RECEIVED
JUL 23 2008
jke
pmo
FILE

Mr. Jared Chang, Project Planner
SSFM, International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

This is in response to your letter of July 7, 2008, requesting comments on a Pre-Assessment Consultation, Draft Environmental Assessment, for the Meyer Residence project in Kahalu`u.

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 4 at 247-2166 or Mr. Brandon Stone of the Executive Office at 529-3644.

Sincerely,

BOISSE P. CORREA
Chief of Police

By William Chun
for DEBORA A. TANDAL
Assistant Chief of Police
Support Services Bureau

Serving and Protecting With Aloha

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Boisse P. Correa, Chief
Honolulu Police Department
City and County of Honolulu
801 South Beretania Street
Honolulu, Hawai‘i 96813

Dear Chief Correa:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu‘u, Island of O‘ahu, Hawai‘i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 21, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that your department has no significant impact on the facilities or operations of the Honolulu Police Department. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
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

FILE COPY

MUFI HANNEMANN
MAYOR

KENNETH G. SILVA
FIRE CHIEF

ALVIN K. TOMITA
DEPUTY FIRE CHIEF

SSFM INTERNATIONAL, INC.
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JUL 25 2008
FILE

July 23, 2008

Mr. Jared Chang
Project Planner
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Preassessment Consultation for Draft Environmental Assessment
Meyer Residence Environmental Assessment and Shoreline Setback Variance
Kahaluu, Oahu, Hawaii
Tax Map Keys: 4-7-019: 050 and 051

In response to your letter of July 7, 2008, regarding the above-mentioned subject, the Honolulu Fire Department reviewed the materials provided and has no objections to the proposed project.

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/SK:bh

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Kenneth G. Silva, Fire Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, Hawai‘i 96813

Dear Chief Silva:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu‘u, Island of O‘ahu, Hawai‘i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 23, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that your department has no objections to the proposed project. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 523-4730 • Internet: www.honolulu.gov

MUFI HANNEMANN
MAYOR

WAYNE YOSHIOKA
DIRECTOR

RICHARD F. TORRES
DEPUTY DIRECTOR

TP7/08-269968R

July 16, 2008

SSFM INTERNATIONAL, INC.
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JUL 17 2008
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FILE

Mr. Jared Chang
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Pre-Assessment Consultation: Meyer Residence Environmental Assessment and Shoreline Setback Variance

This responds to your letter of July 7, 2008, requesting pre-consultation in preparing for a Draft Environmental Assessment (DEA) related to the subject project.

We have no comments to offer at this time. However, the Hawaii State Department of Transportation should be consulted since the project's access to Kamehameha Highway falls under their jurisdiction and control.

Should you have any questions on the matter, you may contact Mr. Brian Suzuki, AICP at 768-8349.

Very truly yours,

WAYNE Y. YOSHIOKA
Director

cc: Mike Oshiro, TE
James Burke, PTD
Faith Miyamoto, RTD

FILE COPY

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Wayne Y. Yoshioka, Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawai'i 96813

Dear Mr. Yoshioka:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 16, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project

We note that your department has no comment to offer at this time. State Department of Transportation was also notified of this project. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

KAPOLEI HALE • 1000 ULUOHIA STREET, SUITE 309 • KAPOLEI, HAWAII 96707
TELEPHONE: (808) 768-3003 • FAX: (808) 768-7053 • INTERNET: www.honolulu.gov

MUFI HANNEMANN
MAYOR

LESTER K.C. CHANG
DIRECTOR

GAIL Y. HARAGUCHI
DEPUTY DIRECTOR

SSFM INTERNATIONAL, INC.
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JUL 15 2008
jke
FILE

July 14, 2008

Mr. Jared K. Chang, Project Planner
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Meyer Residence Environmental Assessment and Shoreline Setback Variance
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahaluu, Island of Oahu, Hawaii
Tax Map Keys: 4-7-019: 050 and 051

Thank you for the opportunity to review and comment on the proposed Meyer Environmental Assessment and Setback Variance.

The Department of Parks and Recreation has no comment and as the proposed residential development will not impact any program or facility of the department, you are invited to remove us as a consulted party to the balance of the EIS process.

Should you have any questions, please cont Mr. John Reid, Planner, at 768-3017.

LESTER K. C. CHANG
Director

LKCC:jr
(269419)

FILE COPY

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Lester K.C. Chang, Director
Department of Parks and Recreation
City and County of Honolulu
1000 Uluohia Street, Suite 309
Kapolei, Hawai‘i 96707

Dear Mr. Chang:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu‘u, Island of O‘ahu, Hawai‘i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 14, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that your department has no comment and does not anticipate impacts to any program or facility of the department. At your request, we will remove you as a consulted party to the balance of the EA process.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
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

MUFI HANNEMANN
MAYOR

CRAIG I. NISHIMURA, P.E.
DIRECTOR AND CHIEF ENGINEER

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 08-594

July 18, 2008

SSFM INTERNATIONAL, Inc.
RECEIVED
JUL 18 2008
jke
cc: pmc
FILE

Mr. Jared K. Chang
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Meyer Residence Environmental Assessment and Shoreline Setback Variance, Pre-Assessment Consultation for Draft Environmental Assessment (DEA), District of Kahalu'u, Island of Oahu, Hawaii, TMK's:4-7-019:050 & 051

Thank you for giving us the opportunity to comment on the subject Pre-Assessment Consultation for DEA. We have no comments to offer at this time. Please keep us informed as to your progress with this project.

Should you have any questions, please contact Larry Leopardi, Chief of the Division of Road Maintenance, at 768-3600.

Sincerely,

Craig I. Nishimura, P.E.
Director and Chief Engineer

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Jeoffrey Cudiamat, P.E.
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, Hawai'i 96707

Dear Mr. Cudiamat:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your department's letter dated July 18, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that your department has no comments to offer at this time. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

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) 523-4567
Web site: www.honolulu.gov

MUFI HANNEMANN
MAYOR

EUGENE C. LEE, P.E.
DIRECTOR

RUSSELL H. TAKARA, P.E.
DEPUTY DIRECTOR

SSFM INTERNATIONAL, INC.
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JUL 24 2008
JKC
pmc
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July 23, 2008

Mr. Jared K. Chang, Project Planner
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Meyer Residence Environmental Assessment and Shoreline Setback Variance
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahaluu, Island of Oahu, Hawaii, TMKs: 4-7-019: 050 and 051

Thank you for giving us the opportunity to review the above Pre-Assessment Consultation.

The Department of Design and Construction (DDC) has the following comments:

- The proposed residence is located in the proximity of the State-owned Kamehameha Highway directly abutting the shoreline of Kaneohe Bay, which also fronts the City-owned but yet to be developed He'eia Kea Valley Nature Park.
- DDC is concerned that the proposed construction may adversely impact shoreline erosion to other areas along the Kaneohe Bay shoreline, including State and City-owned assets. We advise against construction within the shoreline setback area.
- In the case of this Meyer application for residential construction, the need for a shoreline setback variance appears unwise and not justified considering the circumstances. The residential lot owner enjoys the advantage of having an extraordinarily deep lot on which to build away from the shoreline and avoid being subjected to, or creating, coastal hazards.

Should you have any questions, please contact Clifford Lau, Chief, Facilities Division, at 768-8483.

Very truly yours,

FOR Eugene C. Lee, P.E.
Director

ECL:lt (269395)
c: DDC Facilities Division

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Mr. Eugene C. Lee, P.E., Director
Department of Design and Construction
City and County of Honolulu
650 S. King Street, 11th Floor
Honolulu, Hawai'i 96813

Dear Mr. Lee:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu'u, Island of O'ahu, Hawai'i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 23, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project

We note the project area is located adjacent to State-owned Kamehameha Highway, which also fronts the future He'eia kea Valley Nature Park. We note your concerns regarding construction within the property's shoreline setback area. Shoreline erosion impacts to Kāne'ohe Bay will be addressed in the Draft EA and mitigative measures recommended, as necessary. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
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

MUFI HANNEMANN
MAYOR

SSFM INTERNATIONAL, INC.
RECEIVED
JUL 16 2008
JKC
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DEBORAH KIM MORIKAWA
DIRECTOR

ERNEST Y. MARTIN
DEPUTY DIRECTOR

July 10, 2008

Mr. Jared K. Chang
Project Planner
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Meyer Residence Environmental Assessment and Shoreline Setback Variance
Pre-Assessment Consultation for Draft Environmental Assessment
TMK: (1) 4-7-019:050 and 051

Thank you for providing us with the opportunity to review and comment on the Meyer Residence project. We have determined that the project will have no impact on the projects and programs of the Department of Community Services.

We appreciate the opportunity to provide comments. Questions regarding this matter may be directed to Mr. Randall S.J. Wong at 768-7747.

Sincerely,

Deborah Kim Morikawa
Director

DKM:jy

FILE COPY

SSFM INTERNATIONAL, INC.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817
Phone: (808) 531-1308
Fax: (808) 521-7348

Project Managers, Planners, & Engineers
American Council of Engineering Companies, Member

May 4, 2009

SSFM 2007_043.000

Ms. Deborah Kim Morikawa, Director
Department of Community Services
City and County of Honolulu
715 South King Street, Suite 311
Honolulu, Hawai‘i 96813

Dear Ms. Morikawa:

Subject: Meyer Residence Shoreline Improvements
Pre-Assessment Consultation for Draft Environmental Assessment
District of Kahalu‘u, Island of O‘ahu, Hawai‘i
Tax Map Key: 4-7-019: 082

Thank you for your letter dated July 10, 2008 providing pre-assessment consultation comments for the preparation of the Draft Environmental Assessment (Draft EA) for the subject project.

We note that the project will have no impact on the projects and programs of your department. A copy of the Draft EA will be provided when published.

If you have any questions on this matter, please give me a call at (808) 531-1308. Thank you.

Sincerely,

SSFM INTERNATIONAL, INC.

Jared K. Chang
Planner

APPENDIX C

Coastal Engineering Report

KAHALU'U COASTAL ENGINEERING EVALUATION

ISLAND OF OAHU, HAWAII

January 2008

Prepared for:
SSFM Engineers, Inc.

Prepared by:
Sea Engineering, Inc.
Makai Research Pier
Waimanalo, Hawaii 96795

SEI Job No. 7-61

TABLE OF CONTENTS

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1.0 INTRODUCTION

A property owner desires to build a residence on two adjacent lots in Kahalu'u. The Northeast boundary of the lots consists of a steep overgrown bank dropping to Kaneohe Bay. As part of the development, the property owner proposes to build a series of retaining walls to stabilize the bank and provide access to the shoreline. A shoreline setback variance (SSV) is required for this work. In support of this SSV, Sea Engineering, Inc. was contracted to conduct a coastal engineering evaluation. This evaluation consists of: a one day site visit, measuring shoreline profiles, describing the coastal setting, evaluating coastal hazards, describing the shoreline and shoreline processes, performing historical erosion analysis, and preparing a report. The site location is shown in Figure 1-1 and Figure 1-2.

Figure 1-1 Location Map

Figure 1-2 Site Location

2.0 SHORELINE DESCRIPTION

A site visit was conducted on 24 Dec 2007 to investigate existing shoreline conditions and characteristics, measure beach profiles, and take photographs. Profile locations are shown on Figure 2-1 and the profiles are shown on Figure 2-2. Figure 2-1 also presents the certified shoreline. The shoreline is fronted by a 500 to 800 foot wide reef flat which varies in depth from 1 to 3 feet. The reef flat is covered with silty sand, sand, seaweed, coral, and coral rubble (Figure 2-1). The shoreline consists of a narrow, 15 to 30 foot wide, beach composed of rock, cobbles, compact sediment, and silty sand. A steep earthen bank abuts the shoreline (Figure 2-4). The west end of the property, in the vicinity of Profile 3, consists of a steep bank which varies from near vertical to overhanging (Profile 3). A 2 foot high seawall has been built on the adjacent property to the west ((TMK 4-7-19:52) (Figure 2-5) and abuts the west edge of this site. The mid section of this property, at Profile 2, is an exposed point with an exposed basalt bench upon which the survey control is placed (Figure 2-6). The south edge of the property is an exposed dirt bank sloping to the cobble beach (Profile 1) (Figure 2-7). The property immediately to the south does not have a seawall but a massive basalt outcrop extends into the water (Figure 2-8). The next adjacent property to the south is projected by a seawall which extends out into the water (Figure 2-8). The bank slope varies from vertical to 1H:1V (Figure 2-2).

Evidence of erosion can be seen at various locations in the bank including undermining of the bank (Figure 2-9), bare sections of the bank (Figure 2-4), toppled shrubs, brown, turbid water immediately off the beach (Figure 2-4 and 2-7).

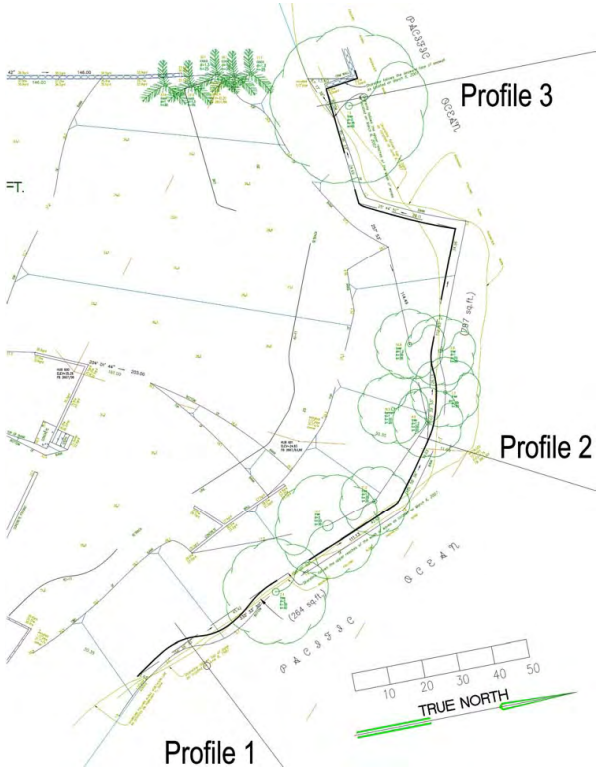
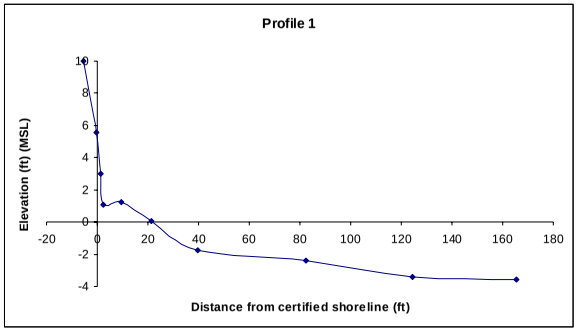
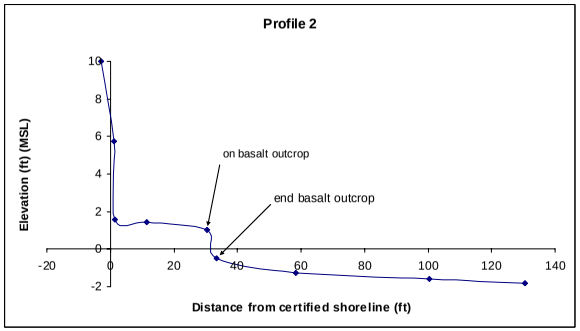


Figure 2-1 Site layout and Profile Locations





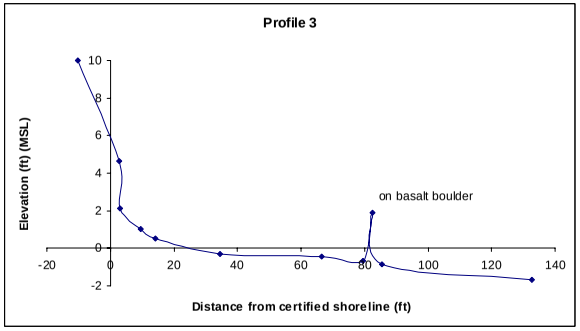


Figure 2-2 Site Profiles

Figure 2-3 Reef flat fronting property

Figure 2-4 Typical beach fronting property

Figure 2-5 Seawall on property to west (TMK 4-7-19:52)

Figure 2-6 Basalt outcropping and survey control at the mid-point of the shoreline.

Figure 2-7 Site of profile 1 at the south end of the shoreline.

Figure 2-8 Basalt outcrop and seawall on adjacent properties to the south.

Figure 2-9 Undermining of dirt bank

3.0 SHORELINE HISTORY AND PROCESS

Photographs from 1975 and 2005 were obtained for the purpose of analyzing shoreline erosion. The image from 1975 was digitally overlaid and scaled over the 2005 image. The images were then analyzed visually. No significant difference in the overhanging vegetation line was noted, indicating that significant recession of the vegetation line has not occurred. During the site visit, there was little evidence of sand transport. Rock outcrops and seawall bound the property on either side. During the moderate trade wind conditions prevailing during the site visit, only small, 0.5 foot waves occurred at the shoreline.

The site visit revealed some evidence of shoreline erosion, including segments of bare earthen bank, some sections where the bank was undercut, turbid brown water nearshore, and some toppled shrubs.

The 1975 photo shows a house occupying the eastern of the 2 lots in question.

Figure 3-1 Site in 1975

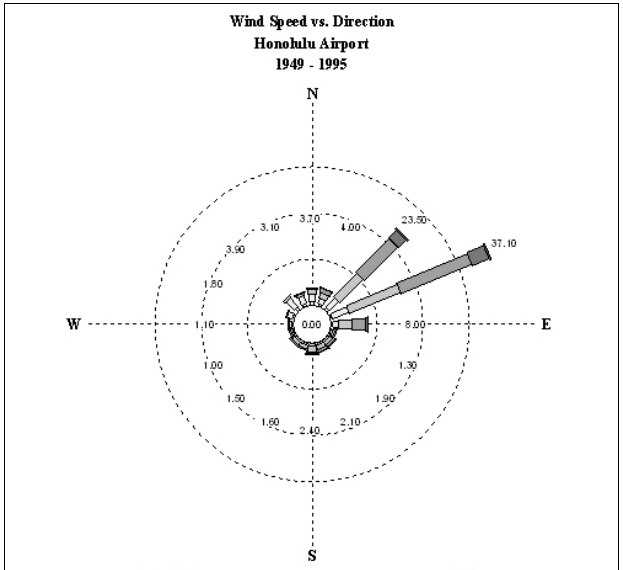
Figure 3-2 Site in 2005

4.0 GENERAL OCEANOGRAPHIC ENVIRONMENT

Kaneohe Bay is a reef sheltered lagoon with a total bay front exposure of 4.6 miles between Kualoa Point to the northwest and Mokapu Peninsula on the southeast. This opening is mostly reef with only two navigable channels, which limits the wave energy entering the bay.

4.1 Winds

Prevailing north to northeast tradewinds frequently blow onshore in this area. According to records compiled by the U.S. Naval Weather Service, north winds with speeds exceeding 27 knots occur less than 1 percent of the time. Historical wind speeds from Honolulu Airport are shown in Figure 4-1. This data has winds of greater than 22 knots occurring 0.8% of the time. For the calculations in this report the higher and therefore more conservative value of 27 knots was utilized



PERCENT OCCURRENCE: Wind Speed (kt)
LOWER BOUND OF CATEGORY

DIR.	0	4	7	11	17	22
N	0.80	1.70	0.90	0.30	0.00	0.00
NNE	0.50	1.20	1.20	1.00	0.10	0.00
NE	0.40	2.80	7.10	10.30	2.40	0.30
ENE	0.40	3.80	12.00	14.40	3.90	0.40
E	0.30	1.30	2.90	2.80	0.40	0.10
ESE	0.10	0.40	0.50	0.30	0.00	0.00
SE	0.10	0.30	0.70	0.70	0.10	0.00
SSE	0.10	0.30	1.00	0.40	0.10	0.00

TOTAL OBS = 13473 MISSING OBS = 0

PERCENT OCCURRENCE: Wind Speed (kt)
LOWER BOUND OF CATEGORY

DIR.	0	4	7	11	17	22
S	0.10	0.40	1.20	0.40	0.10	0.00
SSW	0.10	0.40	0.80	0.30	0.00	0.00
SW	0.10	0.30	0.80	0.30	0.00	0.00
WSW	0.10	0.20	0.40	0.30	0.00	0.00
W	0.20	0.70	0.20	0.20	0.00	0.00
WNW	0.40	1.20	0.20	0.00	0.00	0.00
NW	0.80	2.40	0.40	0.10	0.00	0.00
NNW	0.40	1.80	0.70	0.20	0.00	0.00

CALM OBS = 0 PERCENT CALM = 0.00

Figure 4-1 Historical Honolulu Airport wind speeds

4.2 Tides

A tide station has been in operation in Kaneohe Bay since 1957. Table 4-1 lists commonly used datums, referenced to MSL. The mean tidal range between mean lower low and mean higher

high water is 2.1 feet. The highest recorded water level is 2.53 feet and the lowest is -2.47 feet. An increase of 0.1 ft in MSL has been noted from 1983 to 2001.

Table 4-1 Common Tide Datums, referenced to Mean Sea Level (MSL).

Mean Higher High Water	MHHW	1.07
Mean High Water	MHW	0.75
Mean Diurnal Tide Level	DTL	0.01
Mean Tide Level	MTL	0
Mean Sea Level	MSL	0
Mean Low Water	MLW	-0.74
Mean Lower Low Water	MLLW	-1.05

4.3 Waves

The general Hawaiian wave climate can be described by five primary wave types: 1) northeast tradewind waves generated by the prevailing northeast winds, 2) north Pacific swell generated by mid-latitude low pressure systems, 3) southern swell generated by mid-latitude storms of the southern hemisphere, 4) Kona storm waves generated by local low pressure storm systems, and 5) hurricane waves generated by nearby tropical storms and hurricanes. Northeast tradewind waves occur throughout the year, but the other wave types have seasonal distributions. North Pacific swell and Kona storm waves typically occur from October through March during the northern hemisphere winter. Conversely, southern swell typically occurs from April through September during the southern hemisphere winter. Hurricanes and tropical storms are also summer and fall phenomena.

The southwestern shore of Kaneohe Bay is sheltered from wave attack from the east by the Mokapu Peninsula and by the island of Oahu from waves from the south and west. Waves that do enter the bay from the north and northeast are greatly reduced by the wide and shallow reef protecting Kaneohe Bay.

Analysis of the bathymetry of Kaneohe Bay shows that the maximum wind fetch distance for the project site is 5250 feet to the east (70 degrees) with an average depth of 43 feet. Utilizing Automated Coastal Engineering Software (ACES) waves generated by maximum 27 knot tradewinds blowing across the bay would be 1.1 feet high. These wind waves would break in water of 1.4 to 1.8 feet deep.

The height of larger storm waves would be limited by the depth of water on the reef flat. During 50 years of tidal measurements in Kaneohe Bay, the MHHW level in the bay has been 1.07 feet (MSL) (Table 1). Assuming an average reef elevation of –1.5 feet near the shoreline, this maximum water level would have allowed a maximum wave height of about 1.5 feet at the project site.

The Windward Oahu Hurricane Vulnerability Study (Sea Engineering, 1990) describes the winds produced by a hypothetical worse case scenario hurricane which could occur in Hawaii. Maximum wind speeds of 100 knots would be generated by the scenario. The study calculated

that the approach of such a hypothetical hurricane at Kaneohe could generate wave runup heights within the bay of 10.4 feet at a profile 1200 feet to the west of the site and 11.9 feet at a profile 8000 feet to the south of the site. However, a hurricane has not impacted Kaneohe Bay during recorded history.

5.0 SHORELINE HAZARDS

5.1 Tsunamis and FIRM Designation

The National Flood Insurance Program's Flood Inundation Rate Map (FIRM) assigns this area of Kahalu'u a zone D rating which means the flood hazard is undetermined. Loomis (1976) list tsunami wave run up heights of 2 feet for the 1946 tsunami and 1 foot for the 1952 tsunami.

6.0 DISCUSSION

The shoreline at the Kahalu'u properties consists of a 500 to 800 foot wide reef flat, behind which sits a narrow beach composed of basalt outcrop and boulders, cobbles, sand, and silt. The shoreline is backed by a steep earthen bank. The bank is roughly 25 feet in height with some signs of erosion, including exposed dirt, undercutting, and toppled shrubs. Long term tide measurements in Kaneohe indicate that sea level has risen 0.1 feet in the last 20 years. Sea level is expected to continue to rise, and therefore, bank erosion is also expected to continue at the site.

The site is sheltered, exposed only to small waves created by tradewinds blowing across Kaneohe Bay. The broad reef flat serves to protect the shoreline from tradewind waves which can be up to 1.1 feet high at the site and to storm waves. A maximum wave height at the site is 1.5 feet, limited by water depth on the reef flat.

The client desires to build a seawall behind the certified shoreline. The project site plan indicates that the certified shoreline is located up the earthen bank at an elevation of approximately 5 feet. To prevent failure of the seawall from possible future bank erosion and undermining, the seawall should be founded on solid substrate, or below possible wave scour depth. Assuming the reef flat elevation is -1.5 feet, and the typical wave height is 1.5 feet, the estimated scour depth would be – 3 feet (one wave height below existing offshore ground elevation). Locating the wall behind the certified shoreline may therefore require significant excavation, both to found the wall to a stable depth, and to remove the steeply sloping bank material above the wall.

There are expected to be no significant impacts of a seawall or revetment in this location. The site is well sheltered, and subject to little wave energy. Adjacent properties are protected by seawalls or basalt rock outcroppings. No evidence of sand transport was observed. During the site visit, the water was brown and turbid (see Figures 2.4, 2.5, 2.7, 2.8), likely due to erosion of the exposed dirt banks. Shore protection of this bank could have a beneficial impact by eliminating erosion of the dirt bank and improving water quality.

7.0 REFERENCES

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APPENDIX D

Geotechnical Engineering Report

GEOTECHNICAL ENGINEERING EXPLORATION
47-83 KAMEHAMEHA HIGHWAY
TMK: 4-7-019:050 & 4-7-019:051

Project No. SRSS00107

December 21, 2007 (Revised)

Prepared for:

DR. JOSEPH J MEYER

APPLIED GEOSCIENCES, LLC
2922 Kahaloa Drive, Honolulu, HI 96822 • Tel. (808) 221-0104

GEOTECHNICAL ENGINEERING EXPLORATION
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Applied Geosciences, LLC

• 2922 Kahaloa Drive, Honolulu, HI 96822 • Phone: (808) 221-0104 • ags@pixi.com

December 21, 2007
Project No. SRSS00107

Dr. Joseph J. Meyer
1324-C Pelican Creek Cross.
St. Petersburg, FL 33707

Dear Dr. Meyer:

Applied Geosciences, LLC is pleased to submit our report entitled *Geotechnical Engineering Exploration, 47-83 Kamehameha Highway, TMK: 4-7-019:050 & 4-7-019:051.* Please note that this represents a revised version of the original report, which was dated April 26, 2007.

Our work was performed in general accordance with our agreement of February 17, 2007.

This report presents our findings from a field and laboratory investigation program. Specific recommendations are presented in the body of the report. Should you have any questions, please contact our office.

Very truly yours,

Horst Brandes

Horst G. Brandes, Ph.D., P.E.
President

1. Introduction

This report presents the results of a geotechnical engineering field investigation carried out at 47-83 Kamehameha Highway, located in Kaneohe on the Island of Oahu, Hawaii. The general vicinity, topography and location of the project are shown in Figure 1. The intent of this report is to characterize surface and subsurface soil conditions and to present a set of geotechnical recommendations for the specific purpose of building a single residential home on the site. Drilling and sampling were conducted on March 1-2, 2007, followed by laboratory testing and analysis. The findings and recommendations presented herein are subject to the limitations noted at the end of this report.

2. Scope of Work

Work carried out as part of this project consisted of:

- A review of available soil and geologic data related to the project site
- Coordination of field work with the drilling subcontractor
- Drilling and sampling of five borings to a maximum depth of 35 feet
- Performing a field reconnaissance to identify and characterize surface features
- Field sampling and laboratory testing of selected specimens to assist with classification and characterization of engineering properties
- Analysis of field and laboratory results to formulate a set of geotechnical recommendations
- Preparation of this report summarizing our work

The boring logs and sampling locations are presented in Appendix A. Specific results from the laboratory testing program are included in Appendix B. The experimental findings are discussed throughout the report.

3. Geologic Setting

The project site is located on an elevated bluff between Kamehameha Highway and Kaneohe Bay. It is situated within the caldera of the Koolau volcano and close to the northwest-trending rift zone through which massive eruptions occurred some 1.8 to 2.6 million years ago. The Koolau volcano was unusually elongate. Steep cliffs surrounding the Kailua and Kaneohe basins represent one side of the old caldera. Dike complexes and lava fills dominate the area within this caldera. The lava flows have been weathered and laterized extensively near the surface. Immediately offshore lies the Kaneohe Bay reef complex, which is much younger and laps against the older volcanic formations. Kamehameha Highway rises from sea level at the Kaneohe Fishing Pier to about 30 feet at the property lot, where the road and the coastline take a sharp turn to the west (Figure 1). The elevated headland upon which the property is located sticks out into Kaneohe Bay and has resisted erosion better than the lower-laying adjacent areas. The reason for this may very well be the presence of hard dike formations below the surface soils, as the results from the boring program seem to suggest. The surface soils are generally brick red to brown in color due to a high degree of laterization and alteration of the original lava fills by heat.

4. Surface and Subsurface Conditions at Project Site

The property is barren, except for the presence of a few remnant concrete structures associated with an old battery and what appears to a part of an old house foundation. For the most part, the lot grades gently from the road toward Kaneohe Bay and then descends sharply in the form of a cliff toward the water (Figure 1). The shoreline cliff is covered by dense vegetation and trees and has a slope of approximately 1H:1V (although it is steeper at some locations). At the base of the cliff is a narrow shore bench that is underlain by calcareous sand and reef limestone. High tides and storm surges from Kaneohe Bay can submerge most, if not all, of the shoreline and reach the base of the cliff. The face of the steep slope reveals highly to moderately weathered volcanic flows and sapprolite near the bottom, and about 5 to 10 feet of residual soil near the surface. Blue-gray rock, characteristic of dike formations, is exposed on the steep cliff near the southern end of the property. At some locations this rock is very hard and essentially un-weathered, whereas at others it has been softened by exposure to the elements. However, the face of the cliff consists largely of highly fractured sapprolite and weathered volcanic flows that are unstable. In some places the surface material is tenuously anchored in place by trees and other vegetation. A recent slide appears to have been caused by a remnant CMU wall constructed along the upper edge of the cliff and by the generally unstable face of the slope. This slide alone has caused at least 50 tons of volcanic soil to wash into the ocean and the slide may continue to expand laterally with the potential to waste many more times this amount of material into the bay. High tides and storm surges have undermined the toe of the seaward cliff at many places and may cause additional sliding. The Western end of this shoreline slope has been undermined to the extent that an overhang now exists, sections of which may collapse into the ocean. The erosive action caused by high tides and storm surges is bound to keep removing material from the shoreline slope and thereby continuing to add undesirable volcanic soil into the fragile Kaneohe Bay estuary.

Six soil borings were drilled throughout the site. Hard rock was encountered in three of these borings at relatively shallow depths (7 to 10 feet below grade). This type of rock is associated with dike formations that may very well extend to neighboring properties and help explain the greater resistance to erosion of the entire bluff, as noted above. However, the hard rock was not encountered in all the borings and it cannot be assumed to underlay the entire property. It is typical for dike formations to be separated by lava flows with a more conventional residual soil profile. The soil profile at the site indicates typical residual characteristics with silt and clay soil near the surface, changing to sapprolite and weathered rock at depth. Soils near the surface consist of silts of high plasticity (MH) with fine fractions between about 40% and 60%. The percentage of sand and gravel increases with depth. Free swell indices and Atterberg Limits suggest moderate to high swell potential in the surface soil interval. Such a residual soil profile was noted throughout borings B1 (36.5ft), B5 (21.5ft) and B6 (26.5ft). A similar profile, but truncated, occurred in borings B2, B3 and B4 down to depths of 7.5ft, 9.5ft and 7.5ft, respectively. Hard rock was encountered at those depths and continued augering was not possible.

5. Slope Hazard

Potential slope instability was investigated by examining the shoreline cliff area and by conducting a series of limit equilibrium stability calculations. Two cross sections, lines AA and BB, were considered for the stability analysis (Figures 2-4). The profile for each of these lines was determined from the topographic survey provided by ParEn, Inc (Figure 2). The soil was modeled using the Mohr Coulomb soil model with strength properties determined from direct shear testing, soil layering compiled from the borings, and observation of surface features along each of the sections. Computations were carried out using the Spencer method of limit equilibrium analysis. In the Spencer method inter-slice forces are considered in the analysis and both force and moment equilibrium are satisfied, thus providing a rigorous solution to the problem. Numerous computer-assisted trials were conducted in the search of the critical failure surface, in other words the surface associated with the most probable failure mode.

Figure 3 indicates a minimum factor of safety of 1.22 for line AA. The calculations assume hard rock at a relatively shallow depth, as encountered in borings B2 and B3. A high water elevation is assumed, as shown in Figure 3. This accounts for substantial ground saturation under extenuating circumstances. Although the computed factor of safety is larger than 1.0 and therefore indicates a stable condition, values less than 1.50 are generally deemed potentially hazardous. In this case though the presence of hard rock at relatively shallow depth indicates that any potential sliding would be confined to the residual soil in the upper 5 to 7 feet and that any deep-seated slope failures that may result in a significant head cut into the property are considered quite unlikely, at least at this end of the property. If any failure were to occur, it would probably be confined to sliding above the steep portion of the slope, as indicated by the critical failure plane in Figure 3. This is also surmised from the shallow slide that has occurred nearby and which is alluded to in the previous section. Sliding of this type would occur as a result of soil saturation above the piezometric level assumed in Figure 3 or because of severe undercutting at the toe of the slope.

Stability calculations at the opposite end of the property, line BB, assume soil layering derived principally from the nearby boring B1. That boring indicates a significant increase in penetration resistance at a depth of 25ft below grade. Soil above and below that depth is modeled using the Mohr Coulomb model, although with somewhat higher strength below 25 feet (Figure 4). The calculations indicate a minimum factor of safety of 1.28. This value suggests a stable current configuration under a relatively high assumed water level. A slightly deeper water level would result in a value larger than 1.50. These calculations indicate that overall stability is very much a function of the groundwater level. Under normal dry conditions little if any sliding would be expected. On the other hand, if a high groundwater level were to be established, there could be instances were the stability of the steep cliff might be compromised. Instability in that case would probably involve only a limited amount of sliding, as indicated by the critical failure surface in Figure 4. Even under very severe conditions it would appear unlikely that any sliding would progress much more than about 10 to 15 feet uphill of the current head of the steep cliff.

In summary, whereas the surface of the steep slope at the seaward edge of the property is unstable, the probability of deep-seated slope failures that may result in a significant head cut into the property is

considered much less likely. If the steep shoreline slope is left in its present condition, additional shallow sliding and erosion can be expected, particularly when the ground saturates as a result of surface runoff and/or subsurface seepage. This suggests that a particularly effective means of avoiding slope instability is to properly manage drainage flows throughout the property. Additional recommendations with regard to slope stability and stabilization are provided in the next section. It should be mentioned that the effects of earthquake shaking were not included explicitly in the calculations because the level of ground motions at the site are not well understood. In general, shaking will reduce overall stability either during an earthquake or shortly thereafter.

6. Discussion and Recommendations

In the following it is assumed that a two-floor residential property will be built on the property after all existing structures are removed and the lot is cleared. It is also assumed that none of the work described below will proceed until all the necessary permits have been acquired.

Slope Stabilization

- The steep shoreline slope that leads down to the water is unstable and continued soil loss can be expected if no slope stabilization measures are implemented. As described earlier, this is not likely to cause extensive head cutting into the property, but it will result in continued sliding of soil and rock material into the ocean. Soil erosion along the shoreline slope is undesirable from an environmental point of view due to the damage that volcanic soil can cause to the fragile Kaneohe Bay ecosystem. Stabilization measures such as installation of a retaining wall at the base of the cliff, terracing, and/or other mitigation alternatives such as various methods to anchor the exposed surface of the slope need to be considered. Any remediation alternative should be examined carefully by geotechnical and ocean engineers to insure that it is effective in achieving its intended goal.

- Surface runoff and subsurface seepage flows need to be minimized and routed away from the steep slope fronting Kaneohe Bay. Effective drainage measures need to be incorporated into development plans.

Site Clearing and Grading

- At the beginning of earthwork, areas within the contract grading limits should be thoroughly cleared and grubbed. Vegetation inland of the setback limit (including all trees, hedges and roots), existing structures, concrete foundations, miscellaneous concrete rubble and other unsuitable materials should be removed and disposed of properly offsite. However, no vegetation or other alterations should be made to the steep seaward cliff slope without prior consultation with a geotechnical engineer. Existing utilities should be located and shut off prior to grading operations. If existing utilities are to be abandoned, they should be removed, and the resulting excavation should be properly backfilled with select granular fill material compacted to a minimum of 90 percent relative compaction.

- Any grading involving final elevations above the current grade should be evaluated by a geotechnical engineer to determine its effect on slope stability, particularly stability of the steep shoreline cliff area.

- Structural areas are here defined as locations encompassed within the outermost perimeter of all new structures, plus 5 feet beyond such a perimeter. Structural areas should be confined to portions of the property located at least 20 feet inland of the top edge of the seaward cliff. Within structural areas, the final grade should be clear of all boulders and cobbles larger than 3 inches. Finished subgrades designated to receive new fills should be level before filling operations begin and should be scarified to a minimum depth of 8 inches, moisture conditioned to between 2% and 4% above optimum moisture, and compacted to not less than 90% relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil determined in accordance with ASTM Test Designation D 1557. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

- Select fill material should consist of non-expansive select granular soil of coralline or basaltic origin. It should be well graded from coarse to fine, with no particles larger than 3 inches in largest dimension and between 10 and 30 percent particles passing the No. 200 sieve. Fill material should be free of vegetation, deleterious materials and clay lumps. It should have a laboratory CBR value of 20 or more and a maximum swell of 1 percent or less. Imported fill materials should be tested for conformance with these recommendations prior to delivery to the project site.

- Fill materials should be placed in level lifts not exceeding 8 inches in loose thickness, moisture-conditioned to above the optimum moisture, and compacted to at least 90 percent relative compaction. The compaction requirement should be increased to 95 percent relative compaction for fills placed within 3 lateral feet and 2 feet beneath any proposed foundation element. Filling operations should start at the lowest point and continue up in level horizontal compacted layers in accordance with the above fill placement recommendations.

- In order to avoid flooding, the final grade within all structural areas should be a minimum of 1 foot above the adjacent grade, and preferably more. Drainage swales, French drains, or other drainage provisions should be incorporated in the design so that the final grade does not pond excess water from surface runoff and does not direct such runoff toward structural areas or toward the steep shoreline slope.

- Surface flows on the property should be collected and not be allowed to seep into the subsurface where they can cause slope stability problems. These flows should be conveyed to areas off the property in such a manner that they do not add to the groundwater levels, particularly near the shoreline end of the lot.

- We recommend that all phases of site grading, excavation and fill placement be observed by a representative from Applied Geosciences to confirm compliance with the above recommendations.

Retaining Structures

Some retaining structures may be required for construction of the planned project. The following recommendations are offered for the design of low retaining structures. If the height of any retaining structure is to exceed 4 feet, additional input should be sought from Applied Geosciences.

- The footing of any retaining structure should be embedded a minimum of 24 inches below the lowest adjacent grade. Retaining structures may be designed assuming an allowable bearing pressure of 2,000 pounds per square foot (psf). Lateral loads may be resisted by frictional resistance developed between the bottom of the wall footing and the bearing soil and by passive earth pressure acting against the vertical face passing through toe of the wall footing. A coefficient of friction of 0.30 may be used for concrete footings in contact with the bearing soil. Resistance due to passive earth pressure may be estimated using an equivalent fluid pressure of 200 pounds per square foot per foot of depth (pcf) assuming that the soils around the footings are well compacted. The passive resistance in the upper 12 inches of the soil should be neglected.

- In general, retaining structures should be designed to resist lateral earth pressures due to the adjacent soils and surcharge effects. The on-site soils are not suitable as backfill material within the zone defined by the back of the wall and a 1H:2V plane projected upwards from the bottom of the wall footing. It is assumed that the backfill material within this zone will have the characteristics of the imported fill listed in the 'Site Grading' section and will be compacted as noted therein. Care should be taken not to over-compact the backfill. Recommended lateral earth pressures for design of earth retaining structures are as follows:

	Level Backfill		Maximum Backfill Slope 2H:1V	
	Horizontal	Vertical	Horizontal	Vertical
Active	45	0	65	35
At-Rest	60	0	80	45

- These lateral earth pressures do not include hydrostatic pressures that may be caused by trapped groundwater. Retaining walls that are not free to deflect laterally should be designed for the at-rest condition.

- In general, retaining walls should be well-drained to reduce the build-up of hydrostatic pressures. Either granular material or a prefabricated drainage product should be used in the back of every retaining wall, in conjunction with a perforated collector pipe along the bottom and regularly spaced weep holes. If granular material is to be used as the means of draining the backfill, it should consist of #3B Fine aggregate extending a minimum of 12 inches from the back of the wall. This drainage

aggregate should be separated from other soils by a properly selected geotextile to provide adequate separation and cross-plane drainage functions. The collector pipe at the bottom of the drainage aggregate should consist of a perforated pipe with a minimum diameter of 4 inches and should be inclined to drain by gravity to an appropriate discharge location. Weep holes should be at least four inches in diameter and should be spaced no more than 4 feet apart and no more than 8 inches above ground. Overall filtration and drainage performance of the drainage system should be evaluated during the design stage.

- Surcharge stresses due to areal surcharges, line loads, and point loads, within a horizontal distance equal to the overall height of the adjacent portion of any wall, should be considered in the design. Corresponding lateral surcharge soil pressures should be selected in consultation with a representative from Applied Geosciences.

Foundations

Based on the subsurface conditions encountered at the site, we recommend that embedded spread and/or continuous footings be used to support the planned residential structure. As an alternative, thickened-edge slab footings may also be considered. Depending on the loads to be transferred to the subsurface, and depending on the location of these loads relative to the steep seaward cliff, it may be advisable to consider the use of short caissons or similar deep foundations at selected locations to avoid overloading the slope. The foundation system to be used should be examined by a geotechnical engineer to evaluate its impact on slope stability.

- Subgrade soils at the bottom of footing excavations should be moisture-conditioned to above the optimum moisture and re-compacted to a minimum of 95 percent relative compaction. If soft and/or loose materials are encountered at the bottom of excavations, the soft and/or loose materials should be over-excavated until dense and/or stiff materials are exposed in the footing excavation. The over-excavation should be backfilled with select granular fill materials, moisture-conditioned to above optimum moisture content, and compacted to a minimum of 95 percent relative compaction. Alternatively, the bottom of the footing may be extended down to bear directly on underlying competent material. At least 18 inches of imported select fill material should be placed at the bottom of the prepared footing excavations and compacted to 95 percent relative compaction prior to placing of reinforcing steel or concrete. An allowable bearing pressure of up to 2,500 pounds per square foot (psf) may be used for the design of spread footings for which the subgrade has been prepared in this manner. This bearing value is for dead plus live loads and may be increased by one-third for transient loads, such as those caused by wind or seismic forces.

- The effect of foundation loads on the stability of the steep shoreline slope should be evaluated by a geotechnical engineer to insure that the safety of the existing slope is not compromised.

- In general, footings should be embedded a minimum of 24 inches below the lowest adjacent exterior grade. We recommend that footing excavations be observed by a representative from

Applied Geosciences prior to placement of reinforcing steel and concrete to confirm the foundation bearing conditions and the required embedment depths.

- All concrete slabs-on-grades, including any interior concrete floor slabs, should be designed with a minimum of 24 inches of imported select fill material beneath the slab. A 4-inch granular cushion and a moisture barrier immediately beneath the slab should be added, and may be included as part of the 24-inch thickness. The impervious moisture barrier should be incorporated above the cushion fill to reduce the potential for damage to floor coverings that may be affected by moisture infiltration. All slabs should be properly reinforced.

- Exterior concrete walkways and flatworks should be built over a minimum of 10 inches of open-graded gravel (ASTM C 33, No. 67 gradation) placed on top of a subgrade that has been compacted as described above. To reduce the potential for substantial shrinkage cracks in the walkway slabs, control joints should be provided at intervals equal to the width of the walkways with expansion joints at right-angle intersections.

- Any foundation element should be at a sufficient distance form utility trenches, easements and adjacent foundations to avoid damaging these. Any new foundation should be embedded below a 45-degree imaginary plane extending upward from the bottom of any utility trench. This should minimize new surcharge loads that could damage the utility. Similar setbacks should be observed with regard to all other subsurface utilities and adjacent foundations.

- Finished grades adjacent to any structure or foundation should be sloped to carry water away from them. Effective drainage throughout the property may require the installation of surface swales, French drains and similar structures. Gutter systems should be installed on all roofs and the discharge diverted away from the perimeter of the foundations and the back of retaining walls. All exposed surfaces should be protected from erosion by appropriate means during and after construction. Foundation excavations should be properly backfilled against the walls or slab edges immediately after setting of the concrete to reduce potential excessive water infiltration into the subsurface.

- Planting and irrigation systems, as well as other long-term erosion control measures, should be implemented as soon as finished grades have been completed. Excessive landscape watering near foundations, retaining walls and near the steep shoreline slope should be avoided. Planters within 3 feet of foundations or retaining walls should be avoided as well, or they should have concrete bottoms and drains to reduce the potential for excessive water infiltration into the subsurface. Trees and hedges with large roots should not be planted in the back of retaining walls since they can cause distress to the walls.

- If grade beams or piers are to be used as foundation elements, additional input should be sought from this office to evaluate their effect on the bearing performance of the soil and the stability of the shoreline slope.

Preliminary and final drawings and specifications for the proposed project should be forwarded to Applied Geosciences for review and written comments prior to advertisement for bids. This review is necessary to evaluate general conformance of the plans and specifications with the intent of the foundation and earthwork recommendations provided herein. If this review is not made, Applied Geosciences cannot be responsible for misinterpretation of our recommendations.

It is also recommended that Applied Geosciences be retained to provide geotechnical engineering services during all phases of earth and foundation work. Key monitoring elements include observation of subgrade preparation, fill placement and compaction, construction of the pool, installation of any slope stabilization measures, and adherence to specifications and recommendations. Monitoring by this office should also expedite suggestions for design changes that may be required in the event that subsurface conditions differ from those anticipated at the time this report was prepared. The recommendations provided herein are contingent upon such observations.

If actual exposed subsurface conditions encountered during construction are different from those assumed or considered in this report, appropriate modifications to the design should be made.

7. Limitations

The comments and recommendations presented in this report are based, in part, on the soil conditions encountered in six borings and upon information obtained from literature research and field exploration. Actual conditions beyond the location of the principal borings may differ from those described in this report. The nature and extent of these variations may not become evident until construction is underway. Applied Geosciences should be notified and retained to check if modifications to the recommendations presented in this report are needed if variations appear evident. The comments and recommendations presented in this report shall not be considered valid unless the changes are reviewed by Applied Geosciences and the recommendations of this report are verified by us in writing.

The stratification lines shown on the graphic representation of all the borings depict the approximate boundaries between the various soil and rock units, and as such may denote a gradual transition. Fluctuations in the groundwater level may occur due to variations in rainfall, temperature, tides and other factors that may be different from the conditions that existed at the time the boreholes were drilled. This report does not reflect variations that may result in the subsurface and groundwater conditions. Such subsurface and groundwater conditions may not become evident until construction.

The field exploration portion of this study may not have disclosed the presence of underground structures such as cesspools, drywells, storage tanks, sumps, pits, landfills, buried debris, cavities, voids, etc., that may be present at the site. Should these items be encountered during construction, Applied Geosciences should be notified and retained to provide recommendations for their disposal and/or treatment. Assessment of the presence or absence of these structures was not included in the scope of this study. The scope of Applied Geosciences exploration services was limited to conventional geotechnical

engineering services and did not include any environmental assessment or evaluation of potential subsurface and groundwater contamination. Silence in this report regarding any environmental aspects of the site subsurface and groundwater materials does not indicate the absence of potential environmental problems.

This geotechnical report has been prepared for the use of the client, Dr. Joseph J. Meyer, and his designated engineering consultants in accordance with generally accepted soils and foundation engineering practices. No other warranty, expressed or implied, is made as to the professional advice included in this report and none should be inferred. This report has been developed for the purpose of site grading and construction as described elsewhere in this report. It does not contain sufficient information for purposes of other parties or for other uses. In addition, this report may not contain sufficient data or proper information to serve as the basis for preparation of construction estimates. A contractor wishing to bid on this project is urged to retain a competent geotechnical engineer to assist in the interpretation of this report and/or in the performance of additional site-specific exploration for bid estimating purposes.

The owner/client should be aware that unanticipated subsurface conditions are commonly encountered. Unforeseen subsurface conditions, such as perched groundwater, soft deposits, hard layers, or cavities, may occur in localized areas and may require additional probing or corrections in the field (which may result in construction delays) to attain a properly constructed project. Therefore, a sufficient contingency fund is recommended to accommodate these possible extra costs.

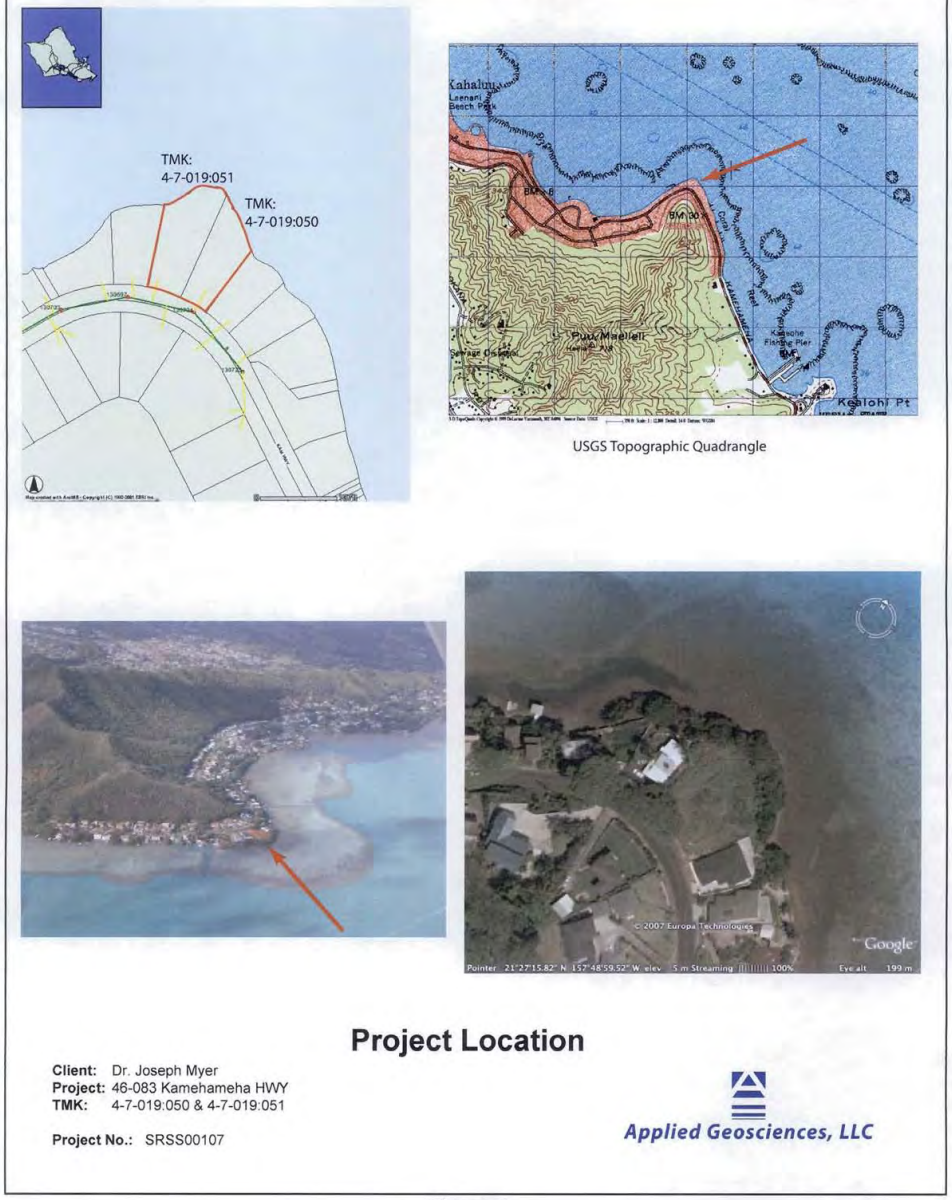


Figure 1

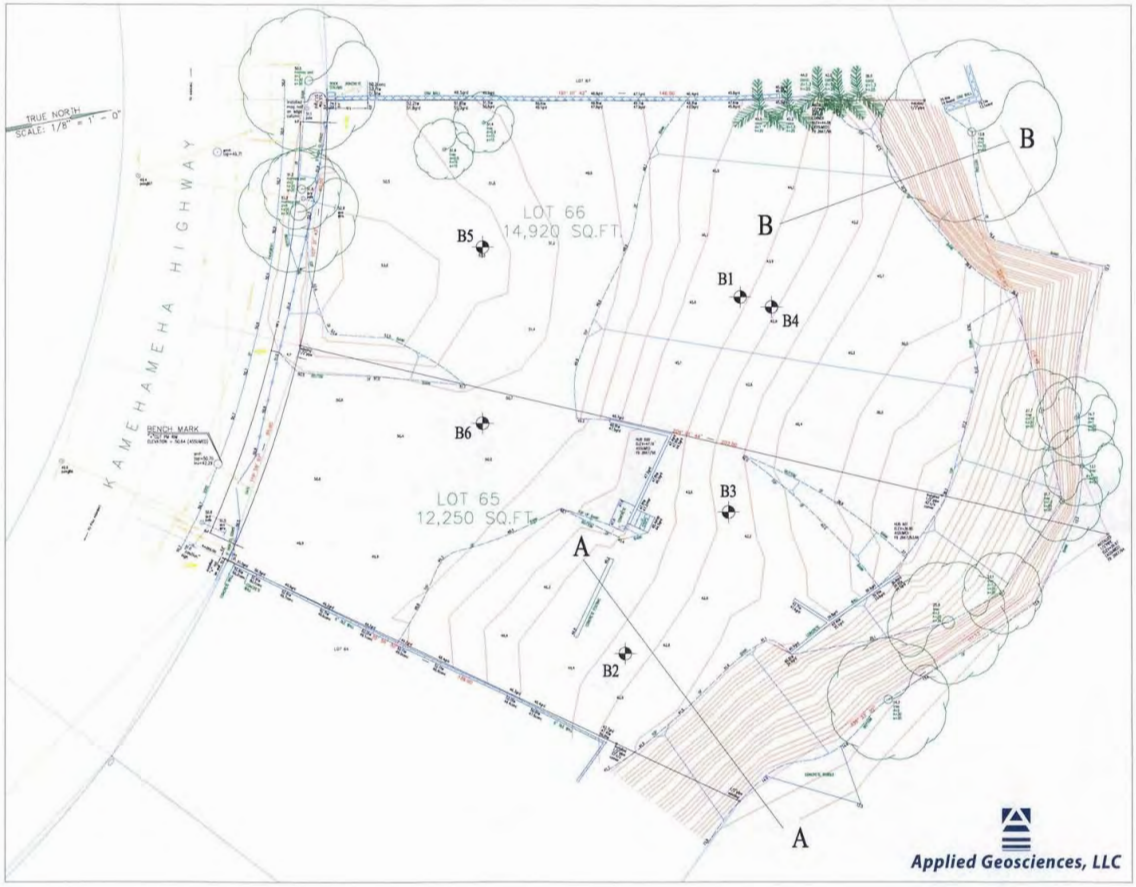


Figure 2. Location of borings and slope stability analysis cross sections

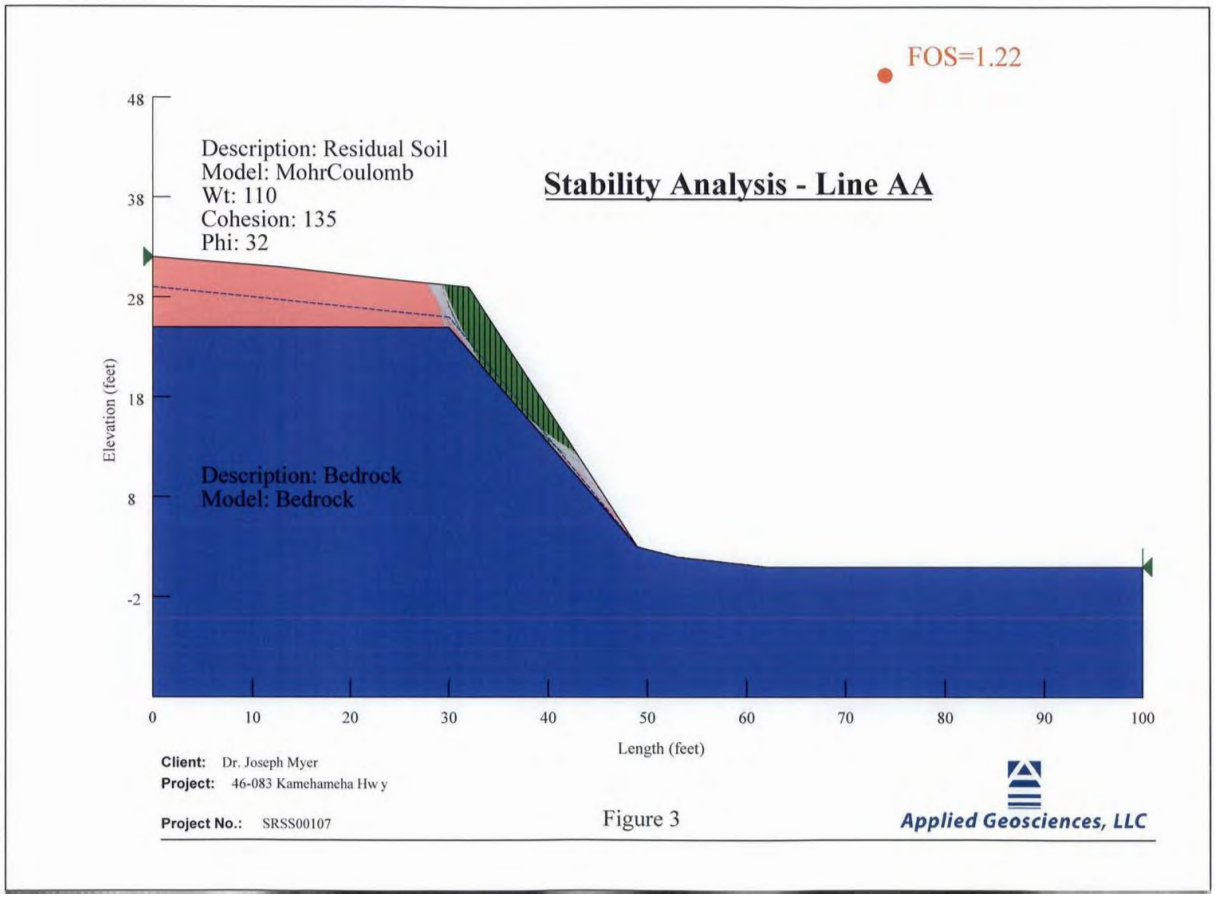


Figure 3

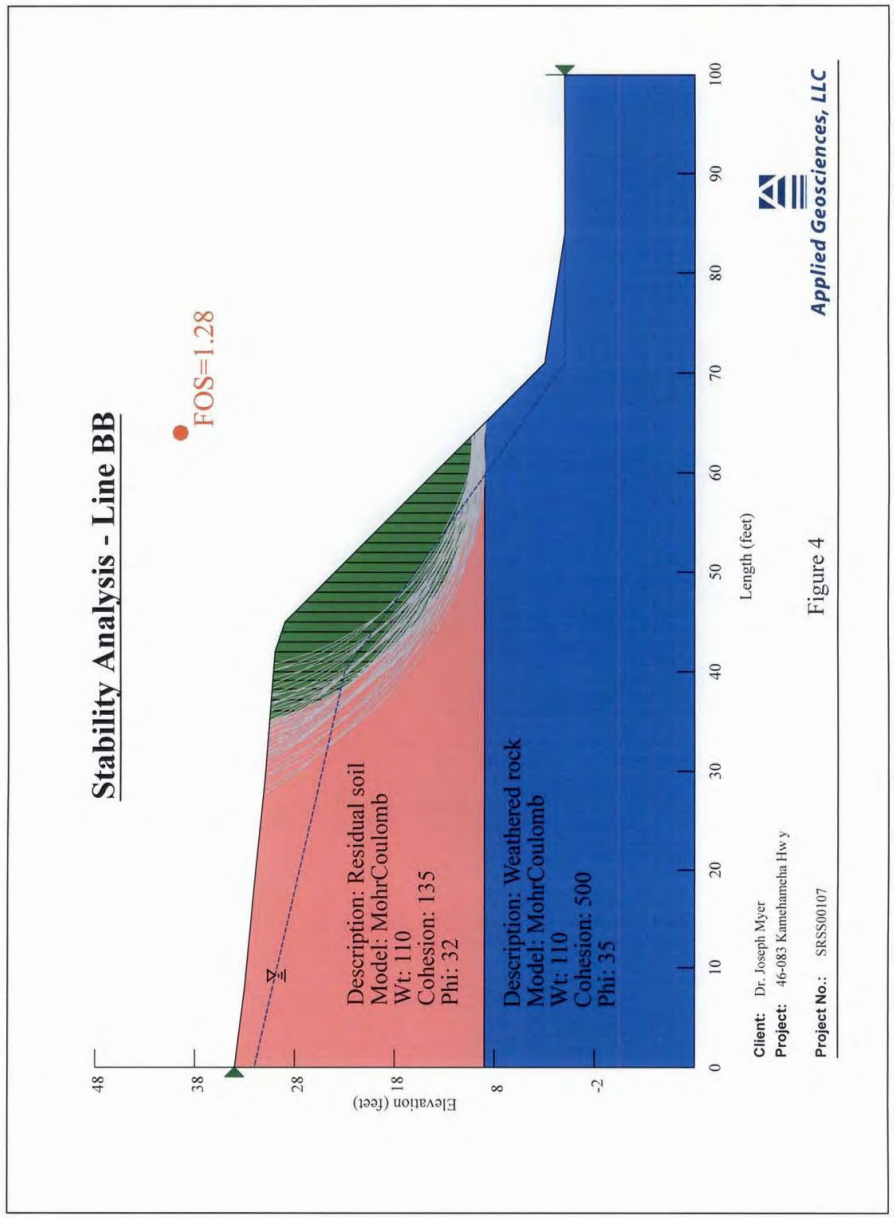


Figure 4

APPENDIX A
Field Exploration

The subsurface conditions at the project site were explored by drilling and sampling six borings, designated as B1 through B6.

All the borings were drilled using a truck-mounted rig that advanced a 6-inch continuous-flight auger. Sampling tools were lowered through the auger's hollow stem. Samples were obtained with a standard 2-inch split-spoon sampler driven by a 140-lb weight descending a distance of 30 inches, or with an equivalent California sampler. Penetration numbers (blow counts) represent the number of blows needed to advance the sampler 12 inches, following an initial penetration of 6 inches, unless noted otherwise. Soil specimens collected with the split-spoon sampler were inspected, characterized visually, and stored in sealed bags for laboratory testing.

Laboratory testing (Appendix B) included determining moisture contents, Atterberg Limits, grain size distributions and shear strengths. Soil samples were classified according to the Unified Soil Classification System.

Figures A1-A6 A1: Boring Logs B1-B6
Figure A7: Boring Log Legend

BORING NO. B1

Applied Geosciences, LLC

File: Test results Date Printed: 12/21/2007

PROJECT: 46-083 Kamehameha Hwy **PROJECT NO.:** SRSS00107
CLIENT: Dr. Joseph Myer **DATE:** 3/1/2007
LOCATION: 47-083 Kamehameha Hwy. **ELEVATION:** 44.3 feet
DRILLER: Ikaika Ramos - Valley Well Drilling **LOGGED BY:** HB
DRILLING METHOD: 6" Hollow Stem Auger
DEPTH TO - WATER> INITIAL: ▽ 34' **AFTER 0.5 HOURS:** ▽ 34' **CAVING>** ⊏

DEPTH (feet)	Description	SOIL TYPE	SAMPLERS	SPT	TEST RESULTS: Plastic Limit — Liquid Limit; Water Content - ●; Penetration - ▬ (10 20 30 40 50 60 70 80 90)	DEPTH (feet)
0	Brown moist plastic clayey SILT(MH) with roots			15		0
	Red clayey SILT(MH), high plasticity, moist, moderate stiffness, unstructured					
5				8		5
	Increasing mottling and sapprolitic structure			8		
10	Increasing stiffness			12		10
	Transitioning from red silt to yellow/brown saprolitic silt			6		
15						15
	Increasing black and dark bands/ inclusions			12		
20						20
25	Highly weathered BASALT, brakes down to clayey silt			83		25
30				32		30
▽ 35	Becoming less fine-grained and less plastic			79		35
	MAXIMUM DEPTH = 36.6 FT					

Figure A1

BORING NO. B2

Applied Geosciences, LLC

File: Test results Date Printed: 12/21/2007

PROJECT: 46-083 Kamehameha Hwy **PROJECT NO.:** SRSS00107
CLIENT: Dr. Joseph Myer **DATE:** 3/1/2007
LOCATION: 47-083 Kamehameha Hwy. **ELEVATION:** 43.6 feet
DRILLER: Ikaika Ramos - Valley Well Drilling **LOGGED BY:** HB
DRILLING METHOD: 6" Hollow Stem Auger
DEPTH TO - WATER> INITIAL: ▽ _____ **AFTER 0.5 HOURS:** ▽ _____ **CAVING>** ⊏

DEPTH (feet)	Description	SOIL TYPE	SAMPLERS	SPT	TEST RESULTS: Plastic Limit — Liquid Limit; Water Content - ●; Penetration - ▬ (10 20 30 40 50 60 70 80 90)	DEPTH (feet)
0	Brown moist plastic clayey SILT(MH) with roots			8		0
	Red clayey SILT(MH), high plasticity, moist, moderate stiffness, unstructured					
5	Red and brown highly weathered BASALT, brakes down to clayey silt			51		5
	Hard basalt ROCK, unable to auger through it					
	MAXIMUM DEPTH = 7.5 FT					
10						10
15						15
20						20
25						25
30						30
35						35

Figure A2

BORING NO. B3

Applied Geosciences, LLC

File: Test results — Date Printed: 12/21/2007

PROJECT: 46-083 Kamehameha Hwy
PROJECT NO.: SRSS00107
CLIENT: Dr. Joseph Myer
DATE: 3/1/2007
LOCATION: 47-083 Kamehameha Hwy.
ELEVATION: 42.7 feet
DRILLER: Ikaika Ramos - Valley Well Drilling
LOGGED BY: HB
DRILLING METHOD: 6" Hollow Stem Auger
DEPTH TO - WATER> INITIAL: ____ **AFTER 0.5 HOURS:** ____ **CAVING>** ____

DEPTH (feet)	Description	SOIL TYPE	SAMPLERS	SPT	TEST RESULTS (Plastic Limit — Liquid Limit; Water Content - ●; Penetration - ▬; 10 20 30 40 50 60 70 80 90)	DEPTH (feet)
0	Brown moist plastic clayey SILT(MH) with roots					0
	Red clayey SILT(MH), high plasticity, moist, moderate stiffness, unstructured					
5	Red and brown highly weathered BASALT, brakes down to clayey silt			32		5
10	Hard basalt ROCK, unable to auger through it MAXIMUM DEPTH = 9.5 FT					10
15						15
20						20
25						25
30						30
35						35

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Figure A3

BORING NO. B4

Applied Geosciences, LLC

File: Test results — Date Printed: 12/21/2007

PROJECT: 46-083 Kamehameha Hwy
PROJECT NO.: SRSS00107
CLIENT: Dr. Joseph Myer
DATE: 3/1/2007
LOCATION: 47-083 Kamehameha Hwy.
ELEVATION: 43.2 feet
DRILLER: Ikaika Ramos - Valley Well Drilling
LOGGED BY: HB
DRILLING METHOD: 6" Hollow Stem Auger
DEPTH TO - WATER> INITIAL: ____ **AFTER 0.5 HOURS:** ____ **CAVING>** ____

DEPTH (feet)	Description	SOIL TYPE	SAMPLERS	SPT	TEST RESULTS (Plastic Limit — Liquid Limit; Water Content - ●; Penetration - ▬; 10 20 30 40 50 60 70 80 90)	DEPTH (feet)
0	Brown moist plastic clayey SILT(MH) with roots					0
	Red clayey SILT(MH), high plasticity, moist, moderate stiffness, unstructured					
5	Red and brown highly weathered BASALT, brakes down to clayey silt			10		5
10	Hard basalt ROCK, unable to auger through it MAXIMUM DEPTH = 7.5 FT					10
15						15
20						20
25						25
30						30
35						35

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Figure A4

BORING NO. B5

Applied Geosciences, LLC

File: Test results Date Printed 12/21/2007

PROJECT:	46-083 Kamehameha Hwy	**PROJECT NO.:**	SRSS00107
CLIENT:	Dr. Joseph Myer	**DATE:**	3/1/2007
LOCATION:	47-083 Kamehameha Hwy.	**ELEVATION:**	52.5 feet
DRILLER:	Ikaika Ramos - Valley Well Drilling	**LOGGED BY:**	HB
DRILLING METHOD:	6" Hollow Stem Auger		
DEPTH TO - WATER> INITIAL:	▽ _____	**AFTER 0.5 HOURS:** ▽ _____	**CAVING>** ⌐ _____

DEPTH (feet)	Description	SOIL TYPE	SAMPLERS	SPT	TEST RESULTS: Plastic Limit — Liquid Limit; Water Content - ●; Penetration - ■ (10 20 30 40 50 60 70 80 90)	DEPTH (feet)
0	Brown moist plastic clayey SILT(MH) with roots			12		0
	Red clayey SILT(MH), high plasticty, moist, moderate stiffness, unstructured					
5	Increasing mottling and sapprolitic structure			12		5
10	Transitioning to yellow/brown sapprolite			6		10
15	Mostly yellow with red, black and brown pockets and bands			12		15
20				41		20
	MAXIMUM DEPTH = 21.5 FT					
25						25
30						30
35						35

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Figure A5

BORING NO. B6

Applied Geosciences, LLC

File: Test results Date Printed 12/21/2007

PROJECT:	46-083 Kamehameha Hwy	**PROJECT NO.:**	SRSS00107
CLIENT:	Dr. Joseph Myer	**DATE:**	3/1/2007
LOCATION:	47-083 Kamehameha Hwy.	**ELEVATION:**	50.5 feet
DRILLER:	Ikaika Ramos - Valley Well Drilling	**LOGGED BY:**	HB
DRILLING METHOD:	6" Hollow Stem Auger		
DEPTH TO - WATER> INITIAL:	▽ _____	**AFTER 0.5 HOURS:** ▽ _____	**CAVING>** ⌐ _____

DEPTH (feet)	Description	SOIL TYPE	SAMPLERS	SPT	TEST RESULTS: Plastic Limit — Liquid Limit; Water Content - ●; Penetration - ■ (10 20 30 40 50 60 70 80 90)	DEPTH (feet)
0	Brown moist plastic clayey SILT(MH) with roots			18		0
	Dark red clayey SILT(MH), high plasticty, moist, moderate stiffness, some saprolitic structure					
5	Increasing mottling, stiffer			21		5
10	Transitioning from red to yellow/brown sapprolite, crumbly appearance			9		10
15	Mostly yellow/brown, stiffer, drier			20		15
20	Decreasing plasticity			15		20
25	Increasing black and red inclusions			19		25
	MAXIMUM DEPTH = 26.5 FT					
30						30
35						35

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Figure A6

KEY TO SYMBOLS

Symbol Description

Strata symbols


Topsoil


Residual silt and sapprolite


Highly weathered basalt


Hard basalt rock

Misc. Symbols


Water table during drilling


Water table at boring completion

Soil Samplers


Standard penetration test


California sampler

Notes:

1. Exploratory borings were drilled starting on 3/1/2007 using a 6-inch diameter continuous hollow stem flight power auger.
2. Free water was measured at the end of drilling.
3. Boring locations were taped from existing features and elevations extrapolated from the existing site plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of some of the tests conducted on samples recovered are reported in the logs.

Figure A7

APPENDIX B
Laboratory Testing

Water contents were determined on recovered specimens that were sealed in the field to preserve their in situ moisture (ASTM D2216).

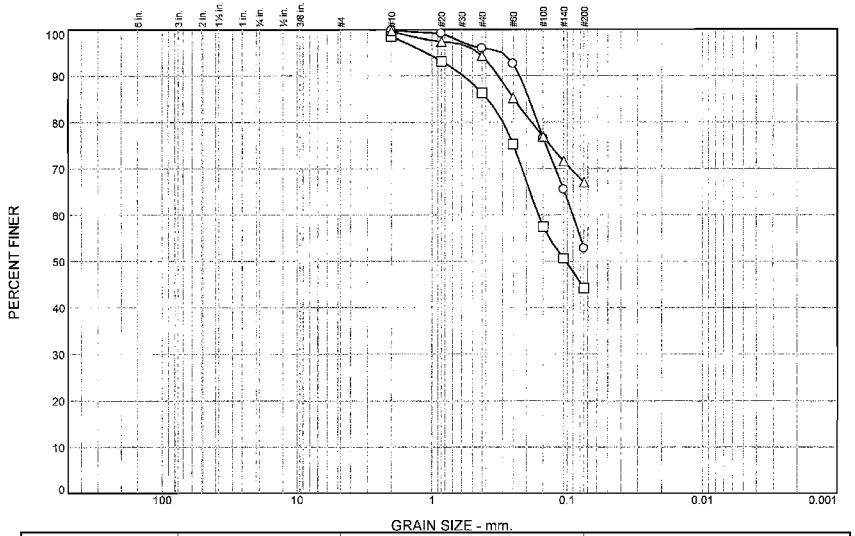
Grain size distributions are based on the results from mechanical sieving (ASTM D422). It should be noted that these tests were carried out on samples recovered with a standard split-spoon sampler, which is unable to retrieve particles larger than 1-3/8 inches. Very coarse gravel, cobbles and boulders are not accounted for in the gradation curves, although they are not thought to comprise a substantial portion of the total soil mass.

Atterberg Limits were determined from specimens that were not allowed to dry below their respective plastic limits (ASTM D4318).

Direct shear tests were conducted on largely undisturbed ring samples obtained with the California sampler. Specimens were saturated prior to testing. Tests were conducted in general accordance with ASTM D3080.

Figure B1: Particle Size Distributions
Figure B2: Atterberg Limits
Figure B3: Direct Shear Test: B4 @ 5 feet

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○					3.9	43.2	52.7	
□					12.2	42.2	44.1	
△					5.3	27.3	67.0	

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	B1		4	Residual silt	MH
□	B1		30	Highly weathered basalt	MH
△	B6		5	Residual silt with sapprolitic inclusions	MH

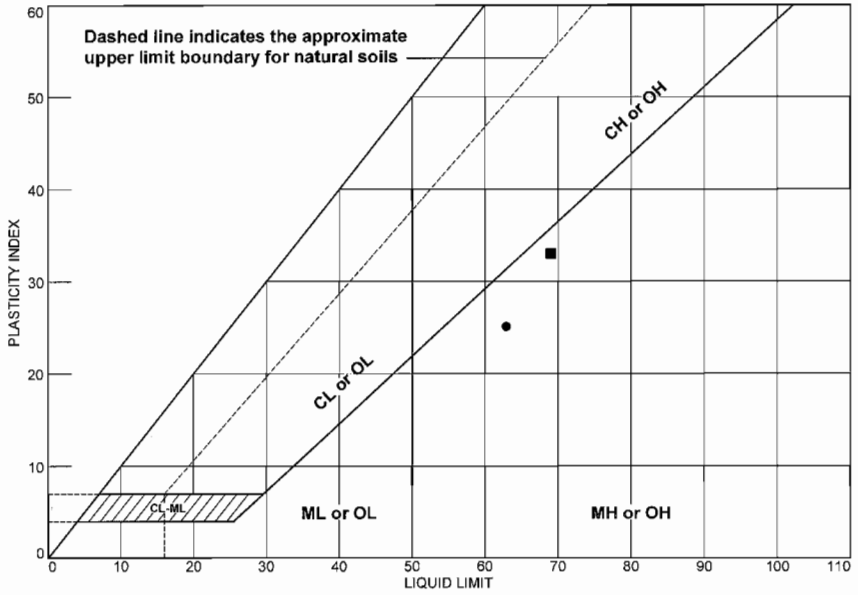
Applied Geosciences, LLC

Client: Dr. Joseph Myer
Project: 46-083 Kamehameha Hwy
Project No.: SRSS00107

Tested By: SW **Checked By:** HB

Figure B1

LIQUID AND PLASTIC LIMITS TEST REPORT



SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	B5		5	44	38	63	25	MH
■	B6		5	44	36	69	33	MH

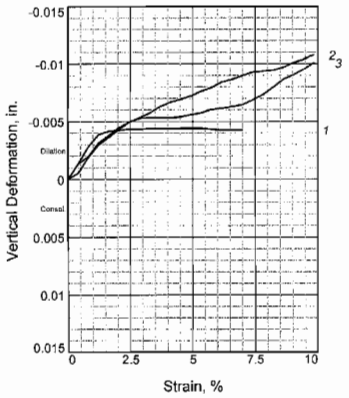
Applied Geosciences, LLC

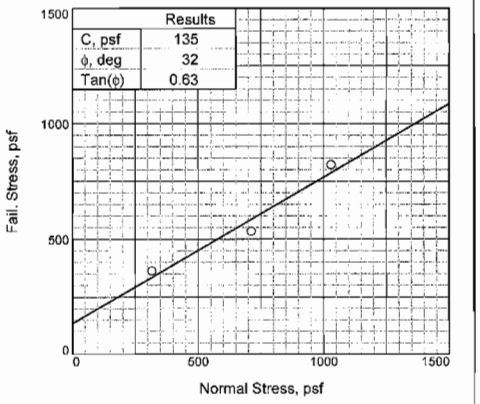
Client: Dr. Joseph Myer
Project: 46-083 Kamehameha Hwy
Project No.: SRSS00107

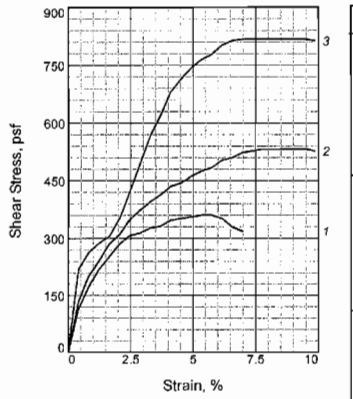
Tested By: SW **Checked By:** HB

Figure B2

Direct Shear Tests: B4 @ 5'







Sample No.		1	2	3
Initial	Water Content, %	19.1	53.5	49.8
	Dry Density, pcf	92.4	68.3	74.6
	Saturation, %	57.8	94.0	101.2
	Void Ratio	0.9592	1.6489	1.4263
	Diameter, in.	2.40	2.40	2.40
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	23.1	62.9	55.1
	Dry Density, pcf	93.1	69.6	75.9
	Saturation, %	70.8	113.8	115.5
	Void Ratio	0.9436	1.6030	1.3843
	Diameter, in.	2.40	2.40	2.40
	Height, in.	0.99	0.98	0.98
Normal Stress, psf		318	714	1032
Fail. Stress, psf		361	532	818
Strain, %		5.3	7.8	7.0
Ult. Stress, psf				
Strain, %				
Strain rate, in./min.		0.04	0.04	0.04

Assumed specific gravity = 2.9

Applied Geosciences, LLC

Client: Dr. Joseph Myer
Project: 46-083 Kamehameha Hwy
Project No.: SRSS00107

Tested By: SW **Checked By:** HB

Figure B3

APPENDIX E

Alternative Shoreline Improvements Considered

TRUE NORTH
SCALE: 1 in. = 10 Ft.

KAMEHAMEHA HIGHWAY (CITY)

TO KAHALUU

TO PALI HIGHWAY

BENCH MARK
+ CUT PM RIM
ELEVATION = 38.76

191° 01' 42"

146.00

6' HIGH WALL

SHOTCRETE

CERTIFIED SHORELINE, TYP.

40' SHORELINE SETBACK LINE

SHORELINE

SEE ARCHITECTURAL PLANS

PACIFIC OCEAN

SHORELINE BOUNDARY (UPPER REACHES OF THE WASH OF WAVE(S) AS

18" HIGH ROCK WALL FACE ALONG EXISTING TOP OF SLOPE

DISTANCE VARIES

15.00'

6' HIGH RETAINING WALL

1.00' MIN.

ACCESS MAINTENANCE STAIRS

15' WIDE FLAT AREA

RAMP LEADING TO BEACH

HUB 118
ELEV=0.84
2667/76

HUB 600
ELEV=35.28
FB 2667/58

HUB 601
ELEV=24.83
FB 2667/63,66

ELEV=1.74
FB 2667/64,76

HUB 605
ELEV=29.63
FB 2667/75

18" HIGH ROCK WALL FACE

8' HIGH RETAINING WALL

15' WIDE FLAT AREA

15.00'

DISTANCE VARIES

1.00' MIN.

BOUNDARY FOLLOWS ALONG HIGHWATER MARK AS SHOWN ON MAP 3

35° 56' 30"

135.35

6' HIGH WALL

LANDSCAPING. SEE LANDSCAPE DWGS

Ocean

PACIFIC OCEAN

Pacific

AUGUST 14, 2007

LEGEND:

- CERTIFIED SHORELINE
- ROCK/SEA/RETAINING WALL (SEE STRUCTURAL DRAWINGS)
- 40' SHORELINE SETBACK LINE

GRAPHICAL SCALE:

10' 5' 0 10' 20'

SCALE: 1" = 10'

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

SSFM INTERNATIONAL

SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

EXP. 4/30/10

SIGNATURE EXPIRATION DATE OF THE LICENSE

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 THE HAWAII ADMINISTRATIVE RULES, TITLE 16, CHAPTER 115, PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS, AND LANDSCAPE ARCHITECTS.

DESIGNED BY:	WMT		
REVIEWED BY:	EMS		
DRAWN BY:	WMT	DATE:	12/31/07

KAHALU'U RESIDENCE

47-83 KAMEHAMEHA HIGHWAY
KAHALU'U, HAWAII 96819
TMK: 4-7-019:050, 051

SITE PLAN - OPTION 1

PROJECT NO.

DRAWING NO. C-2

SHEET NO. 2 OF 3

FILE NO.

DRAWING NAME: I:\2007\2007_043.000 WATG KAHALUU RESIDENCE\G DRAWINGS\CONTRACT DOCUMENTS\CIVIL – SEE VAULT\OPTION 1 DWGS\C-2 SITE PLAN.DWG EDIT TIME: 04-14-09, 2:33 PM EDITED BY: RITO

TRUE NORTH
SCALE: 1 in. = 10 Ft.

PACIFIC OCEAN

SHORELINE RETENTION WALL. SEE NOTE 3

CERTIFIED SHORELINE, TYP.

40' SHORELINE SETBACK LINE

SEE ARCHITECTURAL PLANS

5' HIGH RETAINING WALL

10.00' TYP.

1.00' MIN.

RAMP LEADING TO BEACH

10' WIDE CONSTRUCTION/MAINTENANCE AREA

ANCHORED WIRE MESH EROSION CONTROL BLANKET TO STABILIZE EXISTING SLOPE

PACIFIC OCEAN

KAMEHAMEHA HIGHWAY (CITY)

BENCH MARK
+ CUT PM RIM
ELEVATION = 38.76

NOTE:

1. FOR WALKWAY PATH LEADING TO CONSTRUCTION/MAINTENANCE AREA, SEE LANDSCAPE DWGS.
2. FOR LANDSCAPING AND IRRIGATION, SEE LANDSCAPE DWGS.
3. IF FIELD CONDITIONS PREVENT THE FEASIBILITY OF CONSTRUCTING A SHORELINE RETENTION WALL FRONTING THE SHEAR CLIFF, REVETMENT SHALL BE USED IN LIEU OF A SHORELINE RETENTION WALL.

LEGEND:

- CERTIFIED SHORELINE
- RETAINING WALL (SEE STRUCTURAL DRAWINGS)
- ANCHORED EROSION CONTROL BLANKET
- 40' SHORELINE SETBACK LINE

GRAPHICAL SCALE:

10' 5' 0 10' 20'
SCALE: 1" = 10'

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

SSFM INTERNATIONAL
SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

EXP. 4/30/10

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DESIGNED BY:	WMT	
REVIEWED BY:	EMS	
DRAWN BY:	WMT	
DATE:	12/31/07	

KAHALU'U RESIDENCE

47-83 KAMEHAMEHA HIGHWAY
KAHALU'U, HAWAII 96819
TMK: 4-7-019:050, 051

SITE PLAN - OPTION 2

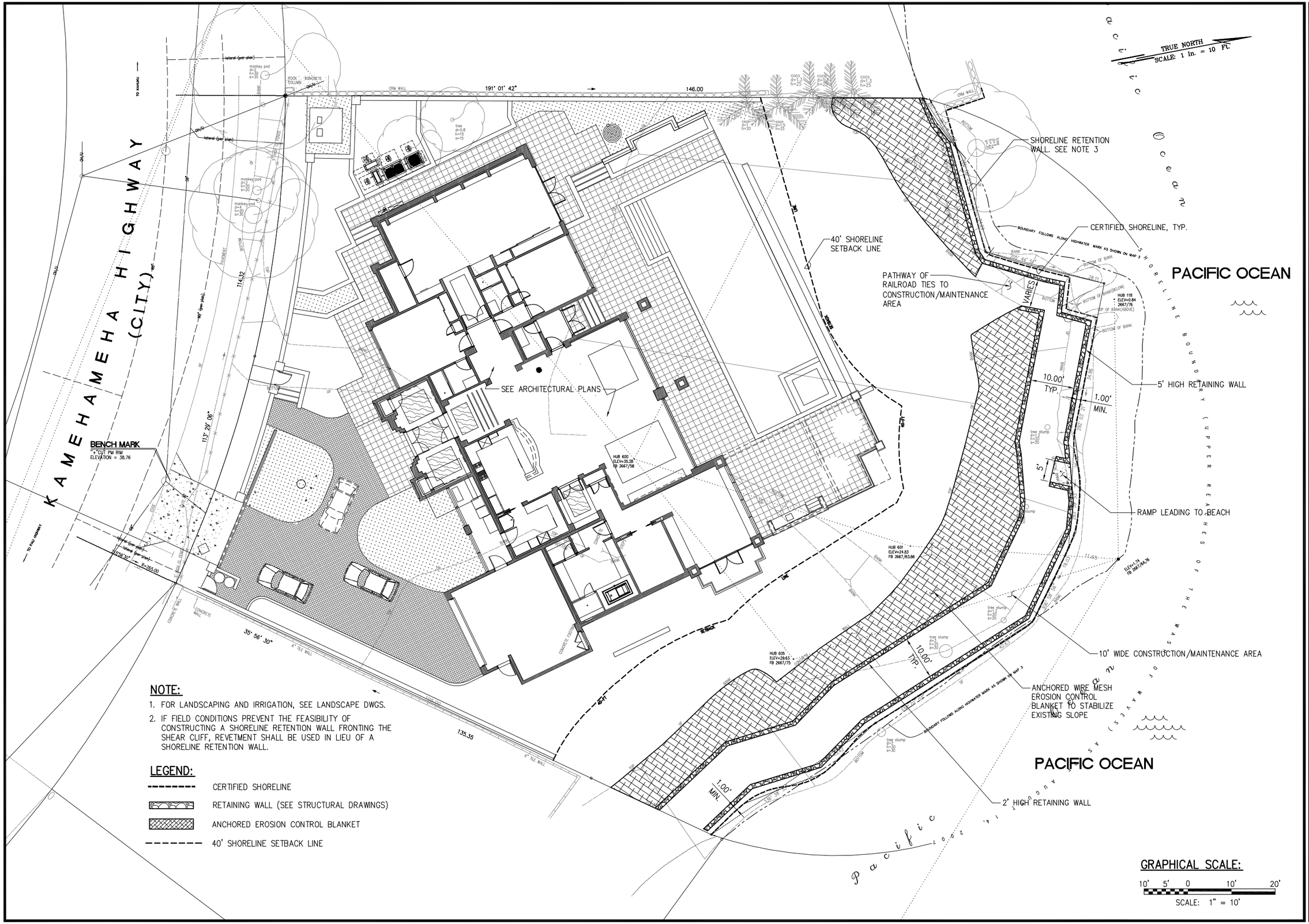
PROJECT NO.

DRAWING NO. C-2

SHEET NO. 2 OF 3

FILE NO.

DRAWING NAME: I:\2007\2007_043.000 WATG KAHALUU RESIDENCE\G DRAWINGS\CONTRACT DOCUMENTS\CIVIL – SEE VAULT\OPTION 2 DWGS\C-2 SITE PLAN.DWG EDIT TIME: 04-14-09, 3:16 PM EDITED BY: RITO



NOTE:

1. FOR LANDSCAPING AND IRRIGATION, SEE LANDSCAPE DWGS.
2. IF FIELD CONDITIONS PREVENT THE FEASIBILITY OF CONSTRUCTING A SHORELINE RETENTION WALL FRONTING THE SHEAR CLIFF, REVETMENT SHALL BE USED IN LIEU OF A SHORELINE RETENTION WALL.

LEGEND:

- CERTIFIED SHORELINE
- RETAINING WALL (SEE STRUCTURAL DRAWINGS)
- ANCHORED EROSION CONTROL BLANKET
- 40' SHORELINE SETBACK LINE

APPROVED	MADE BY	DESCRIPTION	DATE	REVISION

SSFM INTERNATIONAL

SSFM International, Inc.
501 Sumner Street, Suite 620
Honolulu, Hawaii 96817

EXP. 4/30/10

SIGNATURE — EXPIRATION DATE OF THE LICENSE

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 THE HAWAII ADMINISTRATIVE RULES, TITLE 16, CHAPTER 115, PROFESSIONAL ENGINEERS, ARCHITECTS, LAND SURVEYORS, AND LANDSCAPE ARCHITECTS.

DESIGNED BY:	WMT
REVIEWED BY:	EMS
DRAWN BY:	WMT
DATE:	4/15/08

KAHALU'U RESIDENCE

47-83 KAMEHAMEHA HIGHWAY
KAHALU'U, HAWAII 96819
TMK: 4-7-019:050, 051

SITE PLAN - OPTION 3

PROJECT NO.

DRAWING NO. C-2

SHEET NO. 2 OF 3

FILE NO.

DRAWING NAME: I:\2007\2007_043.000 WATG KAHALUU RESIDENCE\G DRAWINGS\CONTRACT DOCUMENTS\CIVIL – SEE VAULT\OPTION 3 DWGS\C-2 SITE PLAN.DWG EDIT TIME: 04-14-09, 2:50 PM EDITED BY: RITO

APPENDIX F

Certified Shoreline Map

TRUE NORTH
SCALE: 1" = 10'

The shoreline as delineated in red is hereby certified as the shoreline as of
December 4, 2008
Chairperson, Board of Land and Natural Resources

KAMEHAMEHA HIGHWAY

LOT 67

LOT 66
14,920 SQ.FT.
(14,066 sq.ft.)

LOT 65
12,250 SQ.FT.
(11,986 sq.ft.)

LOT 64

Pacific Ocean

Shoreline follows the seaward face of seawall as certified on August 14, 2007

Shoreline follows the seaward face of seawall as located on April 22, 2008

Shoreline along the upper reaches of the wash of waves as certified on August 14, 2007

Shoreline follows the upper reaches of the wash of waves as located on April 22, 2008

(854 sq.ft.)

(264 sq.ft.)

MAP SHOWING
SHORELINE FRONTING
LOTS 65 AND 66
OF LAND COURT APPLICATION 979 (MAP 3)
AT KAHALUU, KOOLAUPOKO, OAHU, HAWAII

OWNER : JOSEPH MEYER ADDRESS : 47-83 KAMEHAMEHA HIGHWAY

NOTES:
1) UNDERGROUND PUBLIC UTILITIES SHOWN HEREON ARE FOR INFORMATION ONLY. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION.
2) NOTE: ⇐ ⇒ DIRECTION OF PICTURES TAKEN.

OCTOBER 6, 2008
APRIL 23, 2008
MARCH 5, 2008
AUGUST 28, 2007
DATE: MARCH 13, 2007
FIELD BOOK NO. 2667

10 5 0 10 20
GRAPHIC SCALE : 1"=10'

LICENSED PROFESSIONAL LAND SURVEYOR No 6297 WAYNE M. TERUYA HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
ParEn, Inc.
dba PARK ENGINEERING
Wayne M. Teruya
LICENSED PROFESSIONAL SURVEYOR
CERTIFICATE NUMBER 6297

TAX MAP KEY: 4-7-19:50 and 51

ParEn, Inc. dba Park Engineering
Pacific Park Plaza Suite 1600 711 Kapiolani Blvd Honolulu, Hawaii 96813
808-593-1616

24" X 36" = 6.0 sq. ft.