STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS

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File: MA-3163

NOV 25 2003

MEMORANDUM

TO: Genevieve Salmonson, Director
Office of Environmental Quality Control

FROM: Dierdre S. Mamiya, Acting Administrator
Office of Conservation and Coastal Lands

SUBJECT: Final Environmental Assessment (FEA)/Finding of No Significant Impact (FONSI) for Nguyen Single Family Residence (SFR) in the Conservation District at Kalaepiha Point, Island of Maui

The Department of Land and Natural Resources has reviewed Conservation District Use Application (CDUA) MA-3163 and the Final Environmental Assessment (FEA) for the construction of the Nguyen Single Family Residence (SFR). The Draft Environmental Assessment (DEA) for CDUA MA-3163 was published in the October 23, 2003 OEQC Environmental Notice for the subject project.

The FEA is being submitted to OEQC. We have determined that this project will not have significant environmental effects, and have therefore issued a FONSI. Please publish this notice in the December 8, 2003 OEQC Environmental Notice.

The applicant has delivered via email the OEQC Bulletin Publication Form, and by messenger four copies of the FEA and CDUA MA-3163 for the subject project. Comments on the draft EA were sought from relevant agencies and the public, and were included in the FEA.

Please contact Dawn Hegger of our Office of Conservation and Coastal Lands at 587-0380 if you have any questions on this matter.

2003-12-08-MA-FEA-

Nguyen Residence

TMK (2) 4-2-04:32 (portion)

Final Environmental Assessment

Prepared for: Bill Nguyen

Prepared by:

PBR HAWAII

November 2003

Nguyen Residence

TMK (2) 4-2-04:32 (portion)

Final Environmental Assessment

Prepared for: Bill Nguyen

Prepared by:

PBR HAWAII

November 2003

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1.0 INTRODUCTION

This final environmental assessment (EA) is prepared in accordance with Chapter 343, *Hawai'i Revised Statutes* (HRS), for proposed construction of the Nguyen single-family residence in the Honolua *ahupua'a* of West Maui, on the Island of Maui. This chapter briefly reviews the background and nature of the proposed project, relevant statutory requirements, and the various sources consulted to develop the assessment.

1.1 SUMMARY

Project Name:	Nguyen Single-Family Residence
Location:	West Maui, Maui, Hawai'i
Judicial District:	Lahaina
Landowner:	Maui Land & Pineapple Company, Inc.
Applicant:	Bill Nguyen
Tax Map Key:	4-2-04:32 (Portion)
Property Area:	Approximately 6.5 acres
Existing Uses:	Vacant
Proposed Use:	One single-family residence
Land Use Designations:	State Land Use: Conservation District, Resource Subzone Community Plan: Conservation County Zoning: Not Zoned Special Management Area (SMA): Within the SMA
Permits/Approvals Required:	Compliance with Chapter 343, Hawai'i Revised Statutes (HRS) Compliance with Chapter 6E, Hawai'i Revised Statutes (HRS) Conservation District Use Board Permit Special Management Area Exemption
EA Approving Agency:	Department of Land & Natural Resources
Determination:	Finding of No Significant Impact (FONSI)

1.2 LOCATION

The Nguyen Single-Family Residence will be located on property identified by Tax Map Key 4-2-04: 32 (portion) which is in the northwest portion of West Maui north of the Kapalua Resort and adjacent to Honolua Bay (Figure 1). The property is between Honoapi'ilani Highway and the ocean. The entire area comprises approximately 6.5 acres, not including the immediate shoreline area. Throughout this environmental assessment the property is referred to as the "Kalaepīhā Point" property.

This environmental assessment describes the property area and the potential impacts and mitigative measures for the construction of a single-family residence on the property.

1.3 LAND OWNERSHIP

Maui Land & Pineapple Company, Inc. currently owns the parcel subject to this environmental assessment referenced by Tax Map Key 4-2-04: 32 (portion) (Figure 2). Bill Nguyen is purchasing the property. After all required permits are obtained and the sale is completed Bill Nguyen will construct the single-family residence.

1.4 IDENTIFICATION OF THE APPLICANT

The applicant is Bill Nguyen

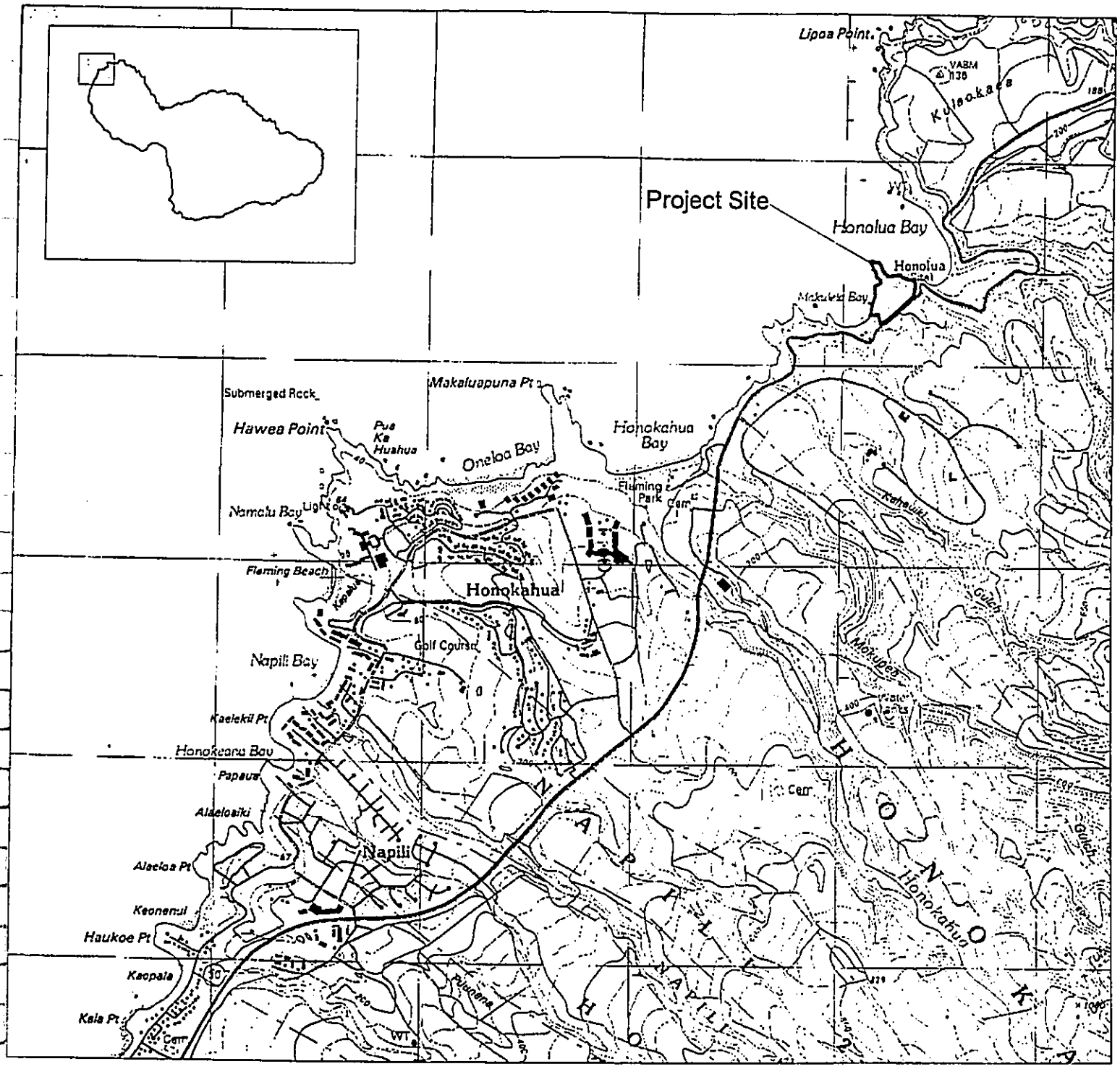
1.5 IDENTIFICATION OF ACCEPTING AGENCY

In accordance with Chapter 343, HRS, environmental assessments must be accepted by the government agency empowered to issue permits for the project. In this instance, the Department of Land and Natural Resources (DLNR) is the accepting agency.

1.6 COMPLIANCE WITH STATE OF HAWAI'I ENVIRONMENTAL LAWS

Section 343-5, *Hawai'i Revised Statutes* (HRS), establishes eight "triggers" that require the preparation of an environmental assessment or environmental impact statement. Actions within the State Conservation District are one of the "triggers" that require an environmental assessment. Kalaepīhā Point is within the State Conservation District and, as such, this environmental assessment is prepared in compliance with Chapter 343, HRS, and in accordance with the provisions of *Hawai'i Administrative Rules* (HAR), Title 11, Department of Health, Chapter 200, Environmental Impact Rules.

This environmental assessment has also been prepared to satisfy the requirements of HAR Title 13, Department of Land and Natural Resources, Subtitle 1 Administration, Chapter 5, Conservation District Rules. These rules require an environmental assessment for construction of a single-family residential structure within the Conservation District.



Legend

Project Site

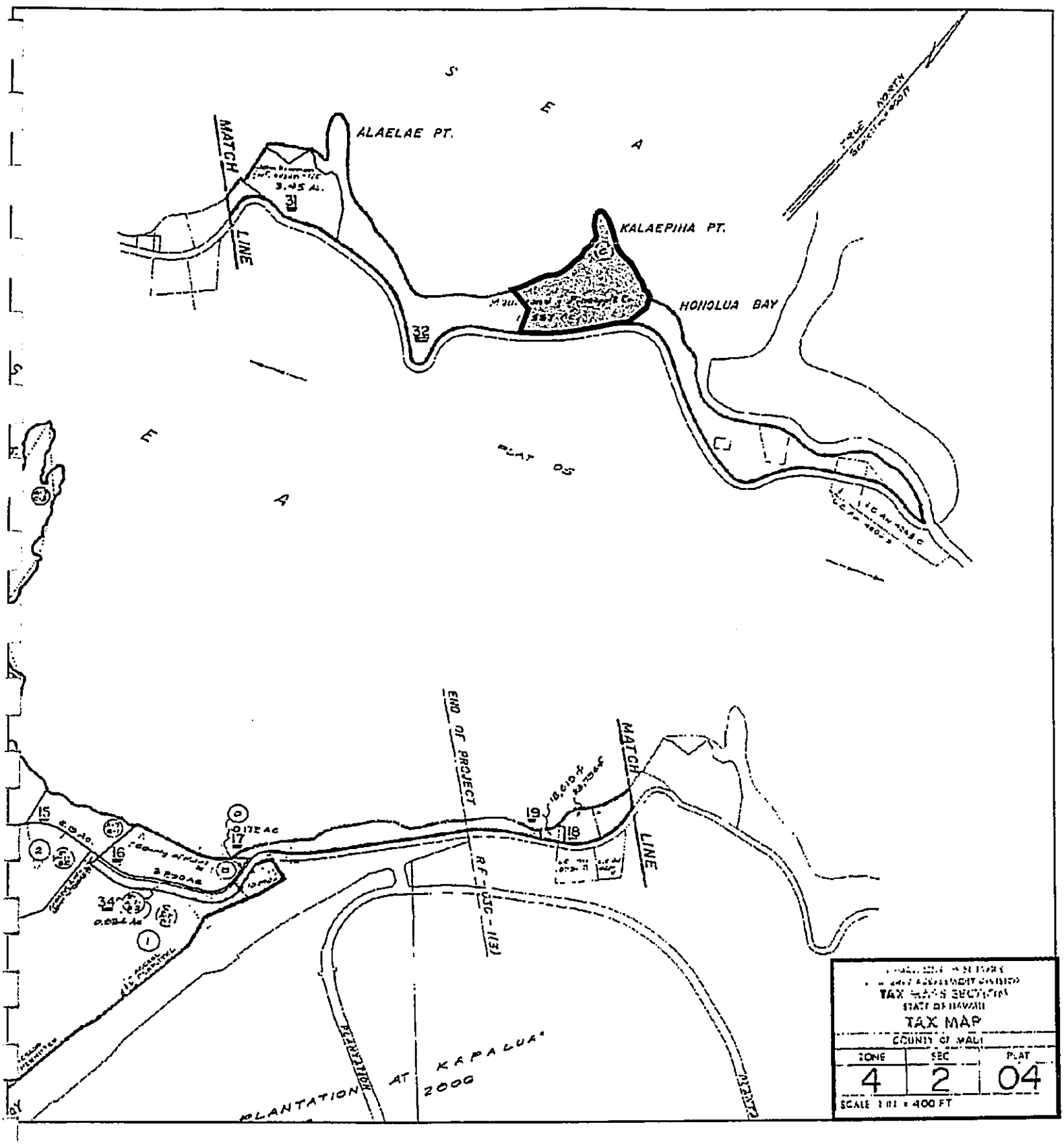
Figure 1
Regional Location Map
NGUYEN RESIDENCE

NORTH

LINEAL SCALE (FEET)
200 0 400

PBR HAWAII

Source: USGS Napili Quadrangle



Legend

Project Site

Figure 2
Tax Map Key
NGUYEN RESIDENCE

NORTH

LINEAL SCALE (FEET)
200 0 400

Source: Tax Map Key

1.7 STUDIES CONTRIBUTING TO THIS ENVIRONMENTAL ASSESSMENT

The Department of Land and Natural Resources accepted the *Kalaepīhā Lands Final Environmental Assessment* (PBR HAWAII 2002) on August 27, 2002. The environmental assessment was completed in partial fulfillment of the requirements for a Conservation District Use Permit allowing the subdivision of an approximately 20-acre parcel located between Honoapi'ilani Highway and the ocean fronting Mokulē'ia Bay and Honolua Bay. The Kalaepīhā Point parcel was one of the three parcels created by this subdivision. The *Kalaepīhā Lands Final Environmental Assessment* received a finding of no significant impact (FONSI) from the Department of Land and Natural Resources. Notice of the FONSI was published in the September 8, 2002 Office of Environmental Quality Control (OEQC) Environmental Notice.

Several specific technical studies were prepared for the *Kalaepīhā Lands Final Environmental Assessment*. Because the studies cover the Kalaepīhā Point parcel, as well as the other two parcels created by the subdivision, and because conditions have not changed, these studies are being referenced in this environmental assessment. The specific technical studies are:

- "Mokulē'ia Coastal Lands Botanical Survey" (Char 2001)
- "Avifaunal and Feral Mammal Survey, Mokulē'ia Coastal Lands, Maui" (Bruner 2001)
- "An Archaeological Inventory Survey of a c. 23-acre Coastal Property Located in Honolua Ahupua'a, Lahaina District, Maui Island, TMK 4-2-04:32." (Fredericksen and Fredericksen. 2002).

1.8 IDENTIFICATION OF AGENCIES/INDIVIDUALS CONSULTED

Public agencies (or agency documents), private institutions, and individuals were consulted during the course of planning for the proposed Nguyen single-family residence, and for the purposes of this environmental assessment. These include:

State of Hawai'i Agencies

Department of Business Economic Development and Tourism
- State Land Use Commission

Department of Land & Natural Resources
- Historic Preservation Division
- Land Division

Department of Transportation

Office of Environmental Quality Control

County of Maui Agencies

Planning Department

Private Institutions and Individuals

Maui Coastal Land Trust
Mr. Leslie Kuloloio, Na Kupuna o Hawaii
Mr. Aimoku Pali of Honokohau Valley
Mr. Wesley Nohara, Manager of Honolua Plantation
Mr. Alexander Ross, descendent of the Koa family
Mr. William Waiohu of the Maui/Lanai Islands Burial Council

2.0 NGUYEN RESIDENCE DESCRIPTION

This chapter provides background information on the Kalaepīhā Point property and describes the proposed Nguyen single-family residence. The property and surrounding region are described, and a preliminary timetable for construction of the residence is provided. Description of the potentially affected environment is provided in Section 4.0 of this document.

2.1 BACKGROUND

2.1.1 Location and Surrounding Uses

The Kalaepīhā Point property is located in the northwest portion of West Maui, north of the main Kapalua Resort area, within the County of Maui, Hawai'i (Figure 1). Kalaepīhā Point[1] is the rocky peninsula that forms the south shore of Honolua Bay and northeast shoreline of Mokulē'ia Bay. Honoapi'ilani Highway abuts the property on its southeast (*mauka*) boundary. Kā'anapali Resort is located approximately five miles south via Honoapi'ilani Highway. Lahaina is about seven miles south.

The surrounding area includes Kapalua Resort's Plantation Estates directly across Honoapi'ilani Highway and a shoreline single-family residence (Brennan Residence) to the south of the Kalaepīhā Point property. The Plantation Golf Course is also within Plantation Estates. With these uses, the immediate area— while rural—is also residential in nature (Figure 3).

Open space and pineapple fields dominate the landscape to the north. Most of the land to the south is part of Kapalua Resort, which includes the Kapalua Bay Hotel and the Ritz-Carlton. Restaurants, homes, condominiums, golf course, and tennis facilities, are also part of the resort.

The waters of Mokulē'ia Bay and Honolua Bay are within the Mokulē'ia/Honolua State Marine Life Conservation District. Fishing and other resource-extraction activities are prohibited here. The beach fronting Mokulē'ia Bay is a popular recreational area, as is Honolua Bay. Ocean-oriented recreational activities are common at both Mokulē'ia Bay and Honolua Bay and include sunbathing, swimming, snorkeling, and surfing.

2.1.2 Kalaepīhā Lands Subdivision

On November 15, 2002, the Department of Land and Natural Resources approved the subdivision of the approximately 20-acre Kalaepīhā Lands parcel (TMK 4-2-.0: 32) into three separate parcels (CDUA MA-3095). The 6.5-acre Kalaepīhā Point parcel was one of the three parcels created by this subdivision. The other two parcels are termed the "Coastal Reserve" parcel and the "Honolua" parcel.

The intent of the subdivision was to preserve the majority of the approximately 20-acre property in open space and recreational uses while allocating the potential for a single-family residence to

[1]One interpretation of the Hawaiian language place name *Kalaepīhā* is "The Piha Point," or the point of land that collects driftwood and other floating objects (after Pukui and Elbert 1971).

the subdivided Kalaepīhā Point parcel. As part of the subdivision requirements, restrictions to prohibit residential uses were placed on the Coastal Reserve and the Honolua parcels.

The four-acre Coastal Reserve parcel south of Kalaepīhā Point contains the land in front of Mokulē'ia Bay, including a beach. The Na Ala Hele Trails program of the Department of Land and Natural Resources, with permission from landowner Maui Land & Pineapple Company, Inc., has built a concrete stairway to provide access from the top of the buff to the beach fronting Mokulē'ia Bay. A small parking area is adjacent to the highway.

To establish permanent conservation of the land, preserve open space and views, and ensure continued public access to Mokulē'ia Bay, Maui Land & Pineapple Company, Inc. proposed to donate the entire Coastal Reserve parcel to the State, the County, or a conservation organization. Maui Land & Pineapple Company, Inc. met with the State Department of Land and Natural Resources, Division of State Parks and the County of Maui Department of Parks and Recreation to offer the parcel for donation. Both of these government agencies declined to accept the parcel, citing lack of funding to properly maintain the property. Maui Land & Pineapple Company, Inc. is currently in discussions with the Maui Coastal Land Trust regarding the donation of the property.

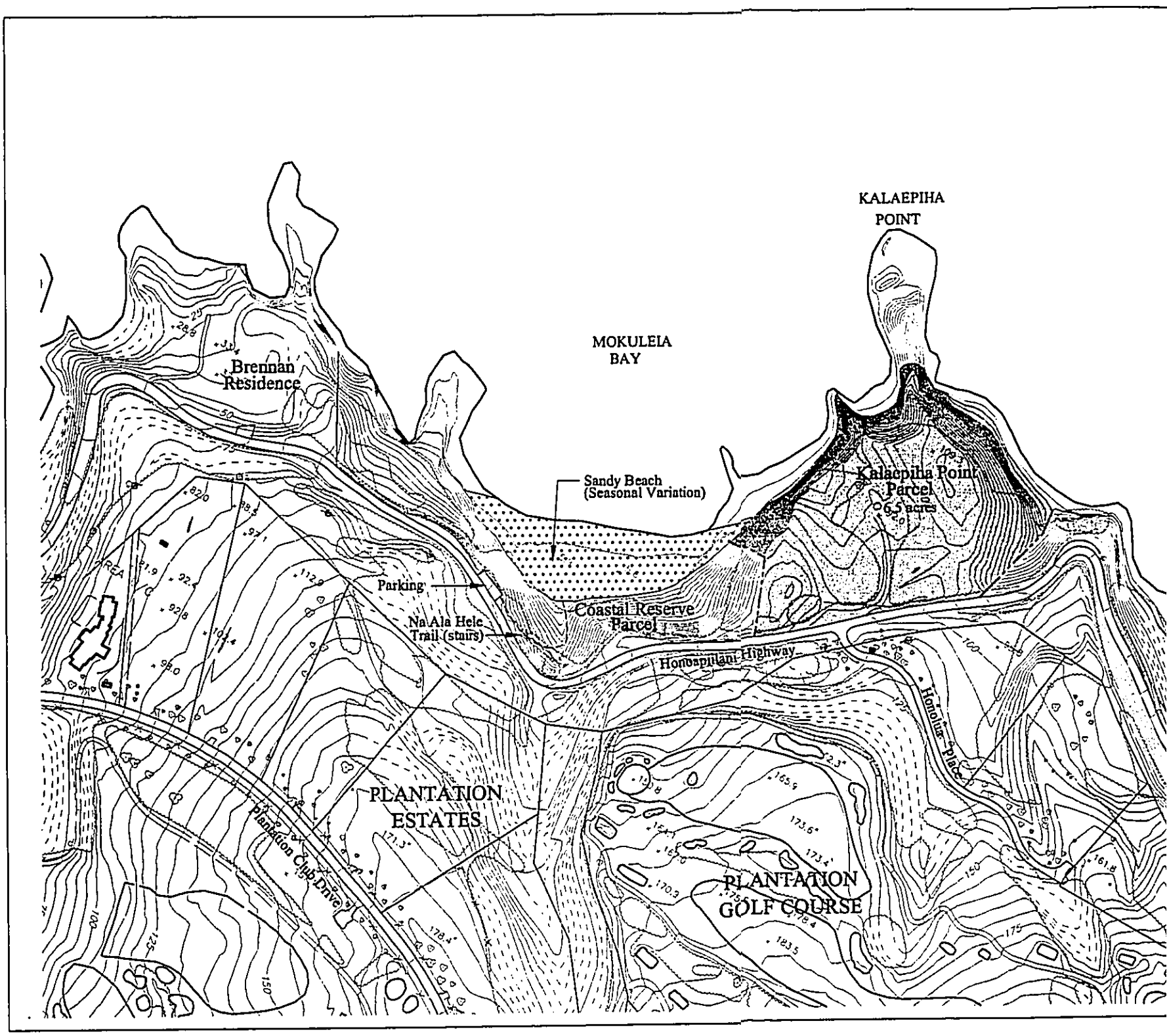
The 9.1-acre Honolua parcel is northeast of the Kalaepīhā Point parcel and contains the land between Honoapi'ilani Highway, the shoreline, and along Honolua Stream. Similar to the Coastal Reserve parcel, no land use changes are proposed, and this parcel will remain in open space and will continue to provide public access to Honolua Bay.

2.1.3 Description of the Property

The 6.5-acre Kalaepīhā Point property (TMK 4-2-04: 32 (portion)) (Figure 2) includes a portion of the actual Kalaepīhā Point and the uplands above the point that extend to Honoapi'ilani Highway. A shoreline survey of this parcel and the adjoining two parcels created from the subdivision was completed in the Fall of 2002 and certified by the Department of Land and Natural Resources on November 22, 2002. The Kalaepīhā Point parcel does not include the immediate shoreline areas as determined by the shoreline survey. See Figure 4 for photographs of the site.

The maximum elevation of the Kalaepīhā Point parcel is 127 feet at a small *pu'u* near Honoapi'ilani Highway. The headland is bounded on all *makai* exposures by steep cliffs, but most of the landscape atop Kalaepīhā Point slopes gently to the southwest.

The parcel is vacant; however there is evidence of both pre-contact and historic activity on the property. An archaeological survey has identified a possible ancient fish-spotting station and other features on the site. While there are no existing buildings, there is a concrete foundation of a former plantation-era meat processing building on the site. Remnants of an old road are also visible and a dirt road curves into the area from a point just northeast of the intersection of Honoapi'ilani Highway and Honolua Place.



Names and Addresses of Adjacent Property Owners

Coastal Reserve Parcel (TMK 4-2-01: 32 (portion))
Honolua Parcel (TMK 4-2-01: 32 (portion))

Maui Land & Pineapple Company, Inc.
120 Kane Street
Kahului, Hawaii 96732

Honoapiilani Highway

State of Hawaii, Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

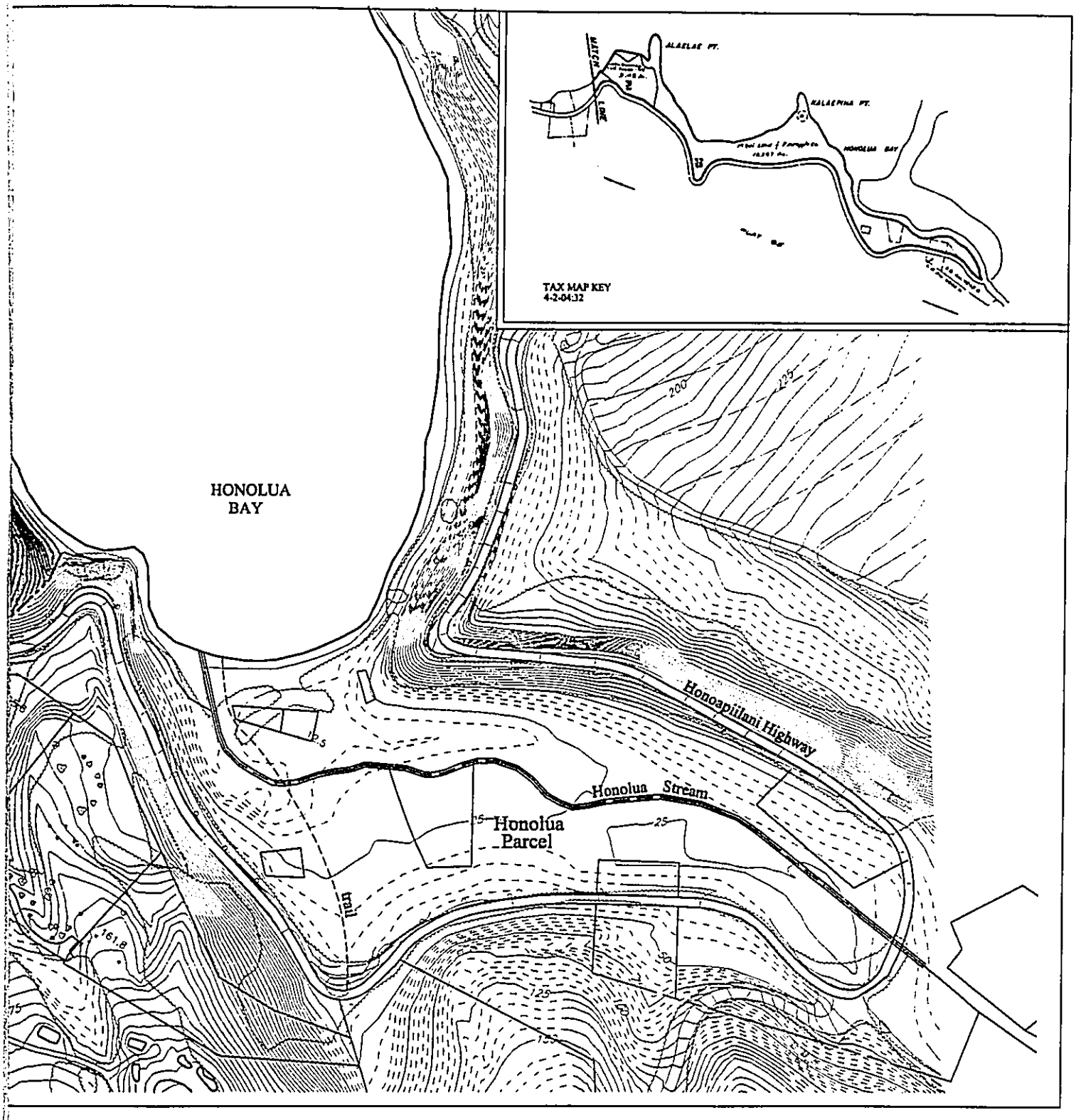


Figure 3

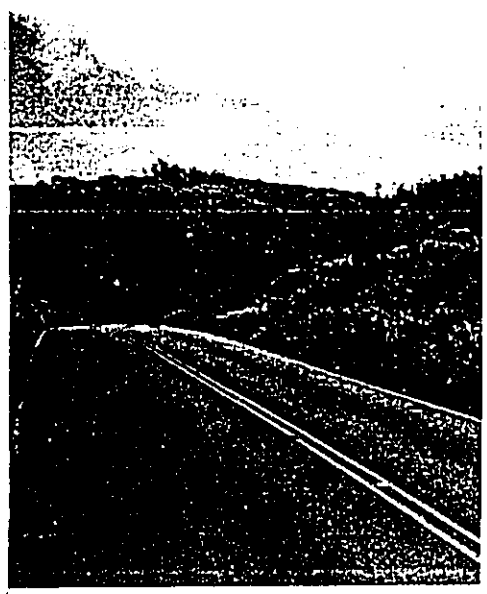
Area Plan

NGUYEN RESIDENCE

1. Looking north along Honoapi'ilani Highway. The Kalaepihia property is on the left, and is screened from the Highway by existing landscaping and topography.

2. The access to the property.

4. The Nguyen residence will be located on the other side of this buff.



3. Looking south from the area of the access gate. The Kalaepiha property is on the right. The landscaping of Plantation Estates can be see on the left.

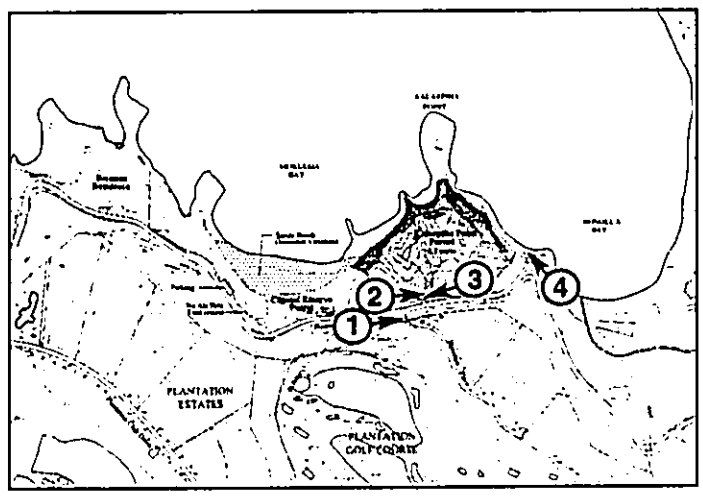
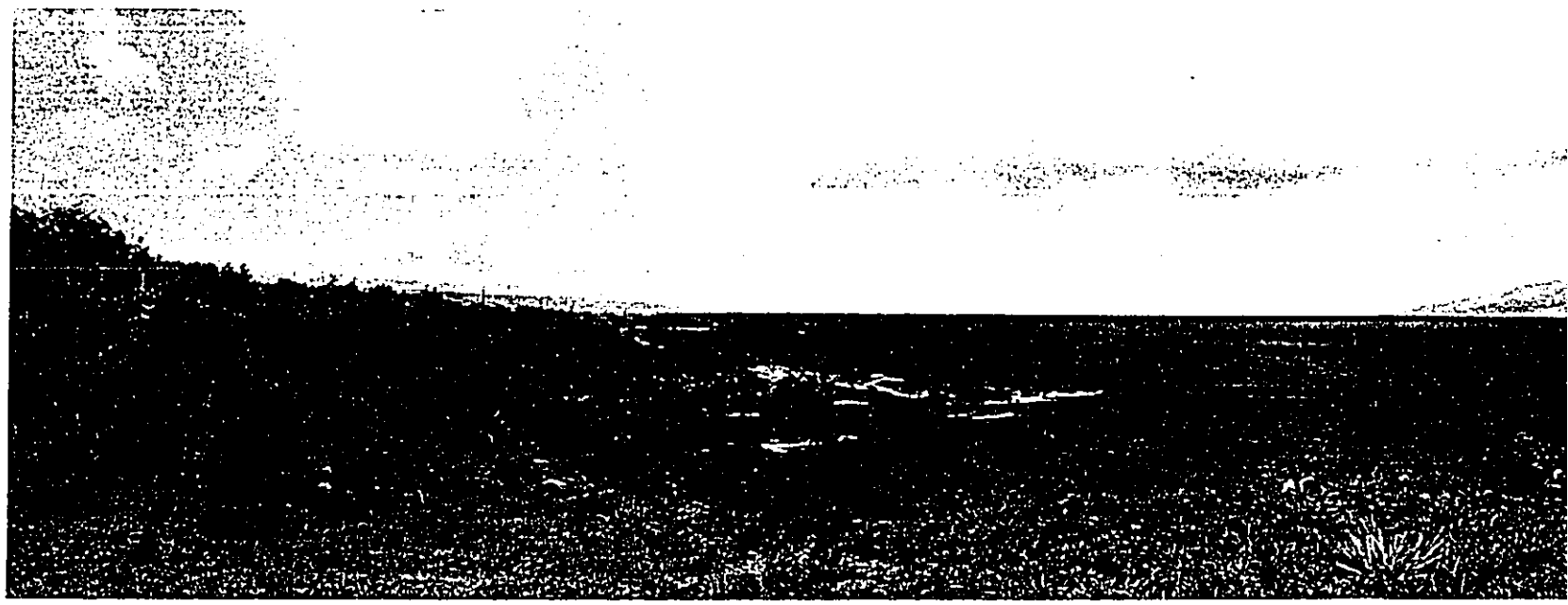


Figure 4A
Site Photographs

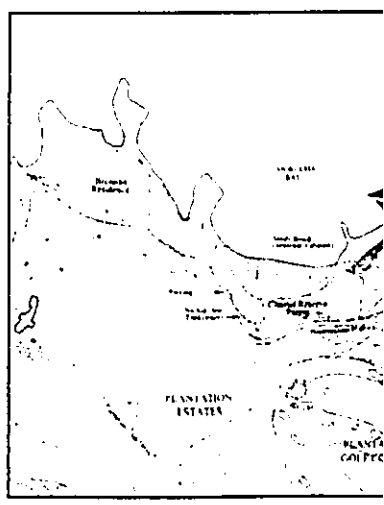
Nguyen Residence

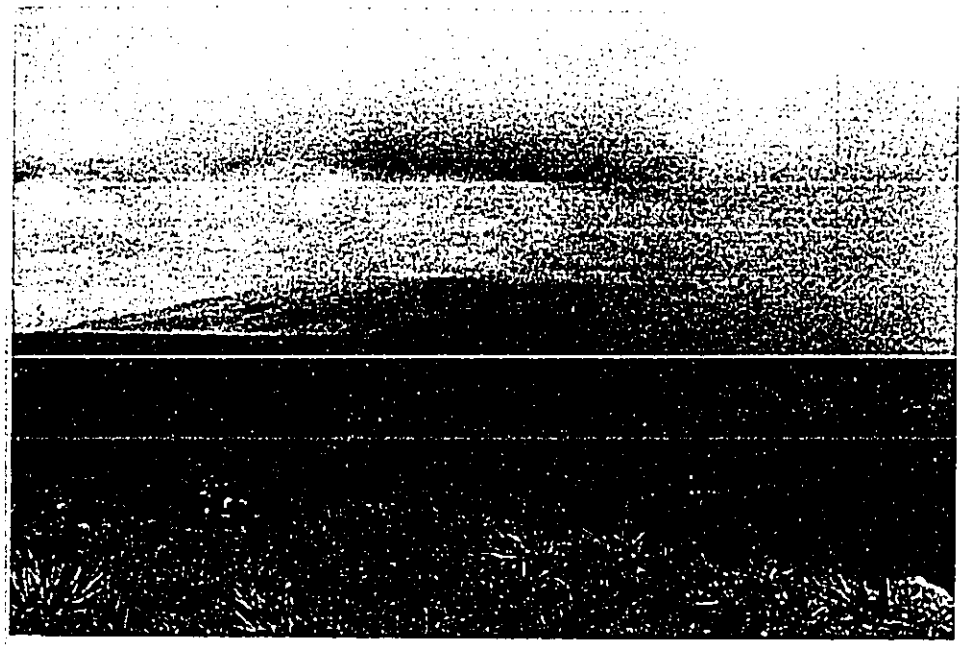
PBR HAWAII



5. The view from the Kalaepiha property. ʻAlaelae Point can be seen across Mokulēʻia Bay.

6. Another view from the Kalaepiha property. Moloka'i can be seen in the distance.





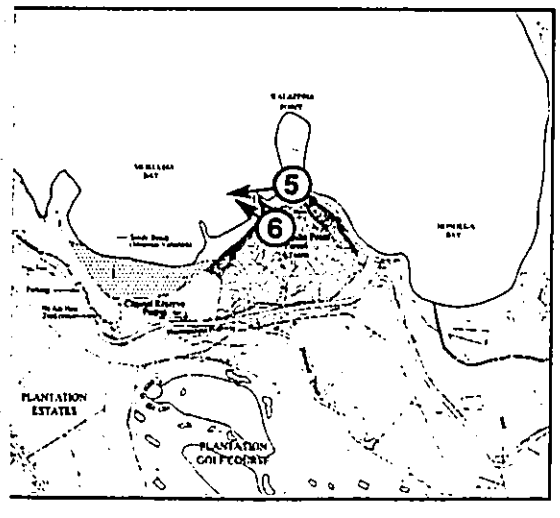
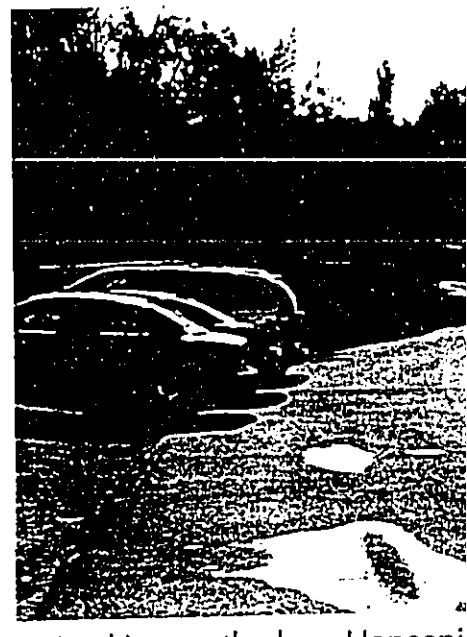


Figure 4B
Site Photographs

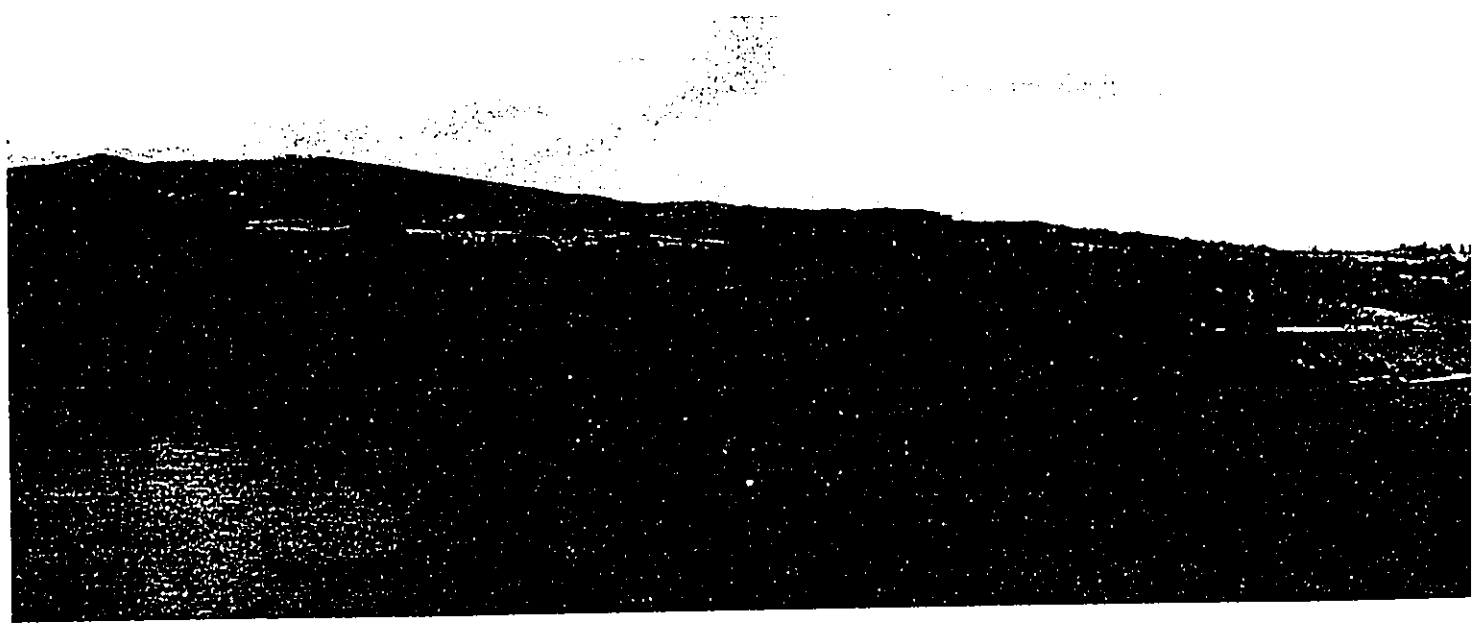
Nguyen Residence

PBR HAWAII

7. The Brennen Residence



8. Looking north along Honoapi
for Mokulē'ia Bay is on the le



9. The Kalaepiha property as seen from the north side of Honolua Bay.

ng Honoapi'ilani Highway. The parking area
is on the left.

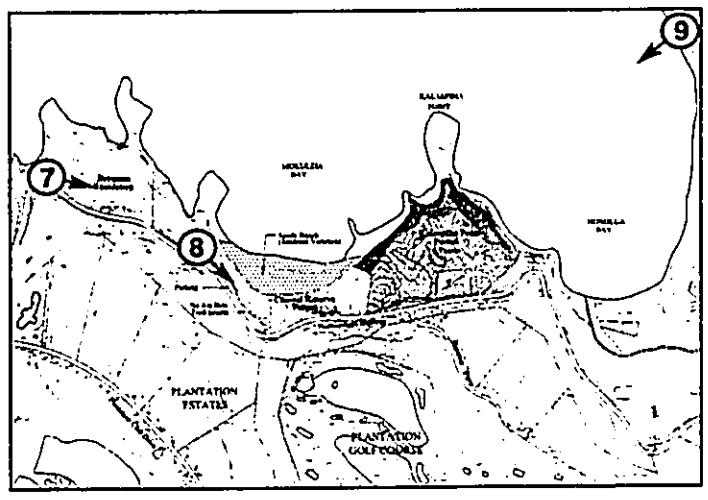


Figure 4C
Site Photographs

Nguyen Residence

PBR HAWAII

2.2 NGUYEN SINGLE-FAMILY RESIDENCE DESCRIPTION

The Nguyen residence will reflect a "Hawaiian Style" architectural design, using traditional materials, colors, and structural forms. The design also recognizes the unique location in which the home is located and is sensitive to view plains and the natural surroundings.

The home is intentionally nestled into a natural hillside bowl to protect views from Honoapi'ilani Highway, adjacent beaches, lookouts and parking areas. It has also been sited close to the natural grade to minimize the need for grade modifications. The orientation of the home, combined with expansive doors and windows, allows for natural ventilation, making air conditioning optional.

The home is comprised of a single-story main building connected by covered walkways to single-story bedroom buildings. Separating the main building and the bedrooms reduces the visual density of the home and provides increased areas for landscaping. Roofs will be double-pitched Hawaiian style and finished in a natural gray slate. Earth tone paint and surface colors will be used for the building exteriors to blend with the natural landscape.

The main building includes shared function and common areas, including the living room, dining room, the kitchen, and a laundry room. On three sides, large hardwood louvered doors fold up into the ceiling to maximize the feeling of openness. Stairs from the at-grade lanai lead to a small pool at a lower elevation.

The entry garden courtyard serves as a transition from the natural landscape of the site to a more formal and manicured garden area surrounding the home. In keeping with the "Hawaiian Style" design local materials such as crushed lava will be used at the driveway and courtyard.

Landscaping will be consistent with the region, with Cook pines and ironwood trees used along Honoapi'ilani Highway to screen the property. Other screen plantings may include hau and naupaka. More formal gardens around the home may include: 1) medium canopy trees such as kamani, wiliwili, seagrape, and milo; 2) accent trees such as plumeria, tecoma, Hong Kong orchard, and others; 3) palms such as loulu, foxtail, and joannis; 4) lawns, including seashore paspalum and St. Augustine. Landscaping will also include native coastal vegetation such as pōhinahina, 'ilima, hala, naupaka, and milo.

The Nguyen home is consistent with the purpose of the Conservation district in that a single-family residence is an identified use within the Resource subzone and that the resources of the site will be conserved, protected, and preserved after the residence is constructed. In addition, the home will not be used for commercial purposes, including transient vacation rentals, time share operations, or as a bed and breakfast operation.

The Nguyen home complies with the "Single Family Residential Standards" established in Exhibit 4 of the Conservation District Rules (*Hawai'i Administrative Rules*, Title 13, Department of Land and Natural Resources, Subtitle 1 Administration, Chapter 5, Conservation). Regarding the floor area computation for single-family residences in the Conservation District, the Standards state:

> *The floor area computation shall include: all enclosed (on three sides minimum, with floor and roof structure above) living areas; above grade decks [emphasis added] in excess on 4'-0" in width; garage or carport; swimming pool, saunas or other developed water features (excluding naturally existing ponds, tidepools, etc.); play courts, or any other standing structures, which are accessory to the approved land use.*

Under this provision at-grade decks (i.e., lanais) are not included in the floor area computation. All lanais of the Nguyen residence are at-grade and therefore the areas of the lanais are not included in the floor area computation. The provision also specifies that areas enclosed on three sides shall be included in the floor area computation. The covered walkways connecting the home will only include a floor and a roof; they will not be enclosed on three sides and therefore the areas of the walkways are not included in the floor area computation.

Following the above floor area computation, the enclosed area of the Nguyen residence will be 4,915 square feet, which is under the 5,000 square foot maximum allowed for homes on lots in the Conservation district larger than one acre.

In further compliance with the Single Family Residential Standards:

- The home will be well within the setback requirements of 25 feet on all sides
- The height of 23'2" of the highest building (the main building) does not exceed the 25' maximum
- The home is compatible with the surrounding environs, and includes landscaping for screening structures, earth tone colors compatible with the surrounding area, and requires minimal grading
- A Department of Health wastewater permit will be obtained
- Structures will be connected
- The home will contain only one kitchen
- The home will be compliance with the applicable building and grading codes (if any), and shoreline setback provisions.

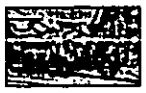
See Figure 5 for the site & preliminary landscape plan. See Figures 6a-6n for architectural plans.

2.3 SUSTAINABLE BUILDING DESIGN

The Office of Environmental Quality Control (OEQC) has issued "Guidelines for Sustainable Building Design in Hawai'i: A Planner's Checklist" (OEQC May 1999) and has requested that consideration be made in applying sustainable building techniques to projects. The OEQC Guidelines state, "[a] sustainable building is built to minimize energy use, expense, waste and

LANDSCAPE LEGEND

VERTICAL TREE MASSING
- COOK PINE
- IRONWOOD

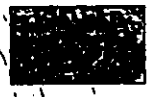


SCREEN PLANTING
- HAU
- NAUPAKA

NATIVE COASTAL VEGETATION
- POHINAHINA
- ILIMA
- COCONUTS
- HALA
- NAUPAKA
- BEACH HELIOTROPE
- MILO
- BEACH MORNING GLORY

MEDIUM CANOPY TREES
- KAMANI
- WILI WILI
- SEAGRAPE
- HUA
- MILO

ACCENT TREES
- PLUMERIA
- TECOMA
- CORAL
- SINGAPORE PLUMERIA
- HONG KONG ORCHID
- OTHERS



PALMS
- LOULU
- FOXTAIL
- JOANNIS

TROPICAL GARDEN AREAS
- VARIETY OF TROPICAL PLANTS

LAWN
- SEASHORE PASPALUM
- ST. AUGUSTINE

EXISTING VEGETATION/UNDISTURBED

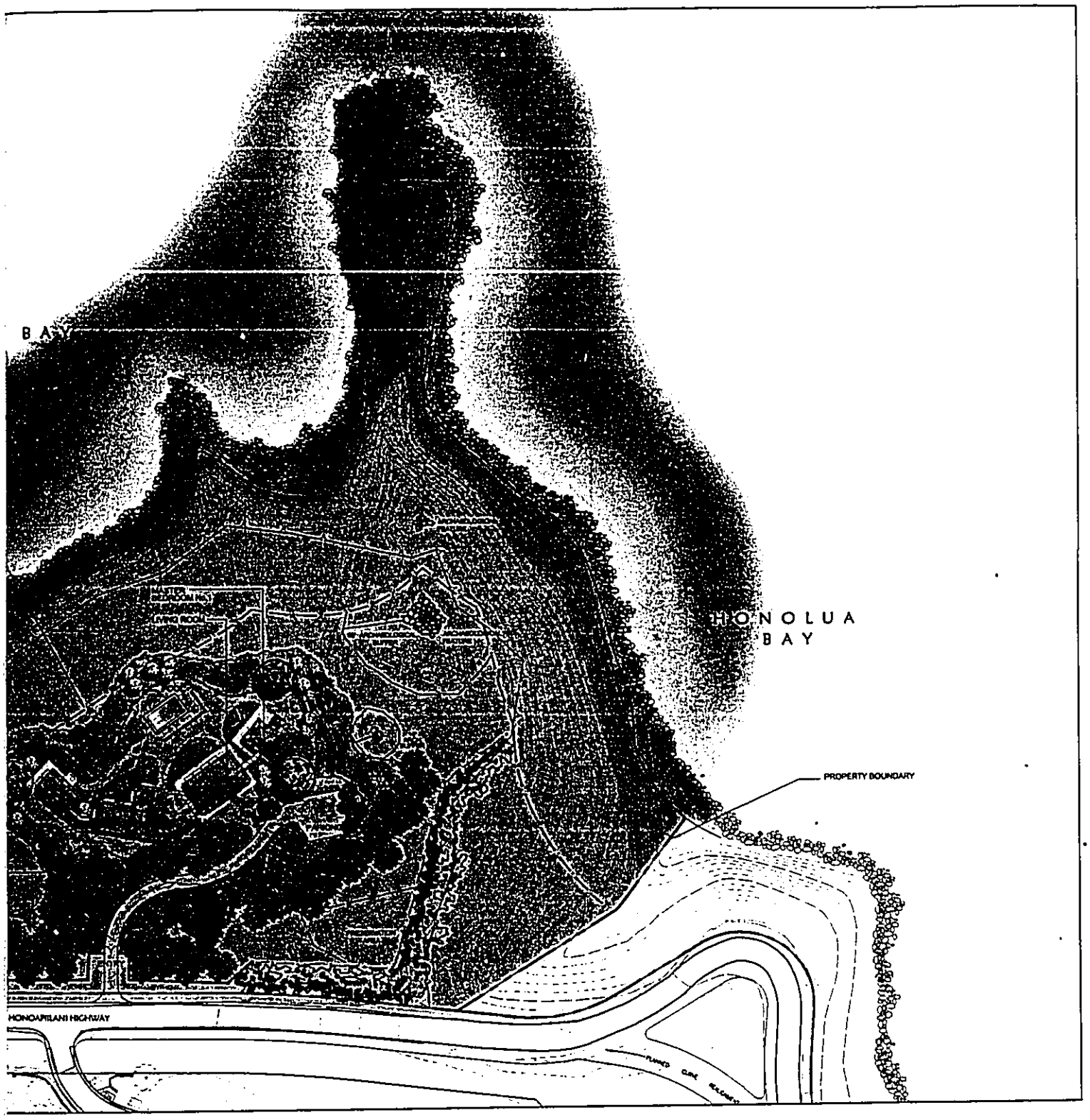


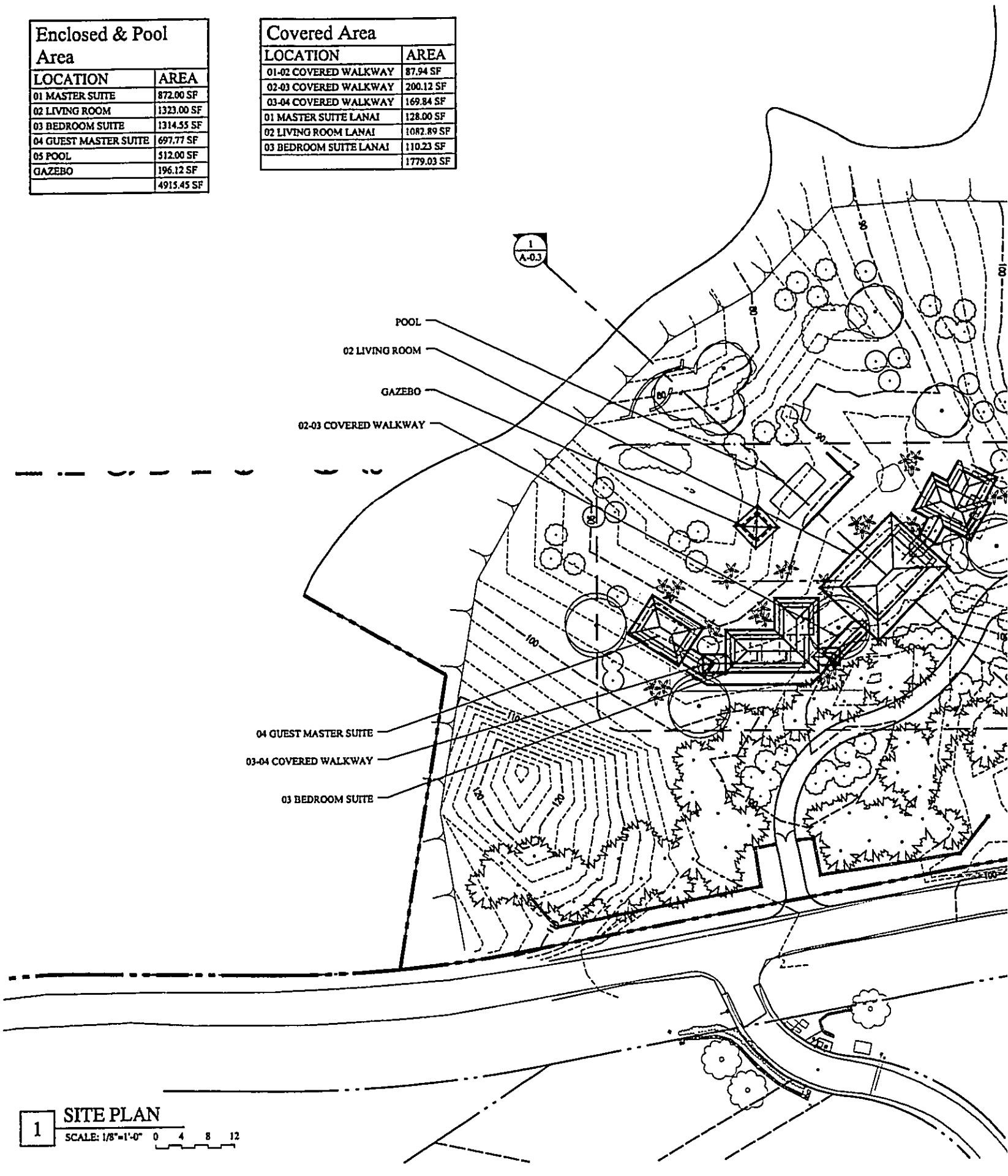
Figure 5

Site and Preliminary Landscape Plan

NGUYEN RESIDENCE

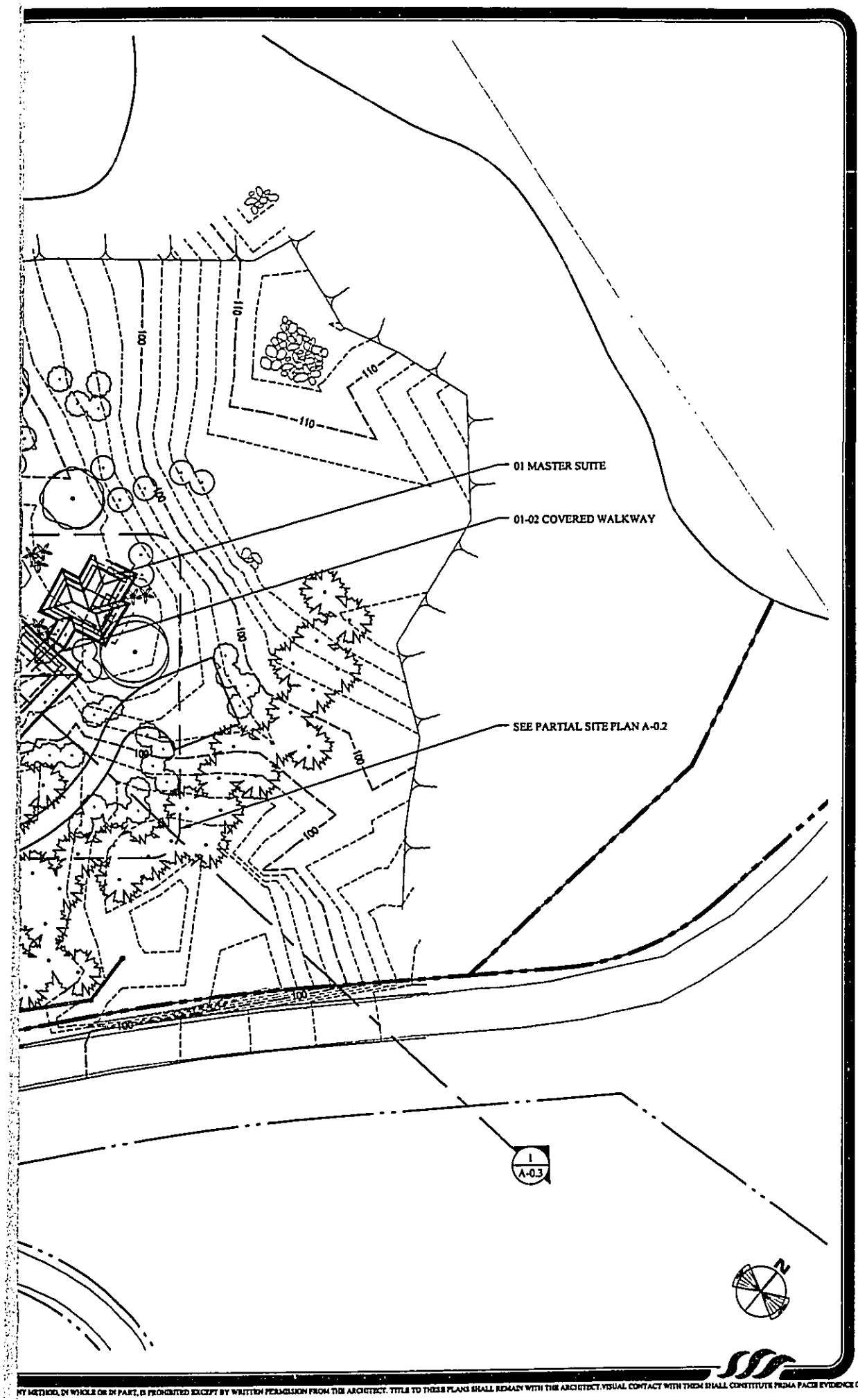
Enclosed & Pool Area	
LOCATION	AREA
01 MASTER SUITE	872.00 SF
02 LIVING ROOM	1323.00 SF
03 BEDROOM SUITE	1314.55 SF
04 GUEST MASTER SUITE	697.77 SF
05 POOL	512.00 SF
GAZEBO	196.12 SF
	4915.45 SF

Covered Area	
LOCATION	AREA
01-02 COVERED WALKWAY	87.94 SF
02-03 COVERED WALKWAY	200.12 SF
03-04 COVERED WALKWAY	169.84 SF
01 MASTER SUITE LANAI	128.00 SF
02 LIVING ROOM LANAI	1082.89 SF
03 BEDROOM SUITE LANAI	110.23 SF
	1779.03 SF



1 SITE PLAN
SCALE: 1/8"=1'-0" 0 4 8 12

DOCUMENT CAPTURED AS RECEIVED



SYM.	DATE	REVISION

This work was prepared by me or under my supervision, and construction of this project will be under my observation, as defined by the Department of Commerce And Consumer Affairs, 16-1152.

Signature

04/30/2004

Expiration Date of the License

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A PRE DESIGN STUDY FOR

KALAEPIHA POINT

Maui, HI

SITE PLAN

SCALE: 1/4"=1'-0"

SHEET
A-0.1
OF
PRELIMINARY
11-19-03
ISSUE DATE

Figure 6a

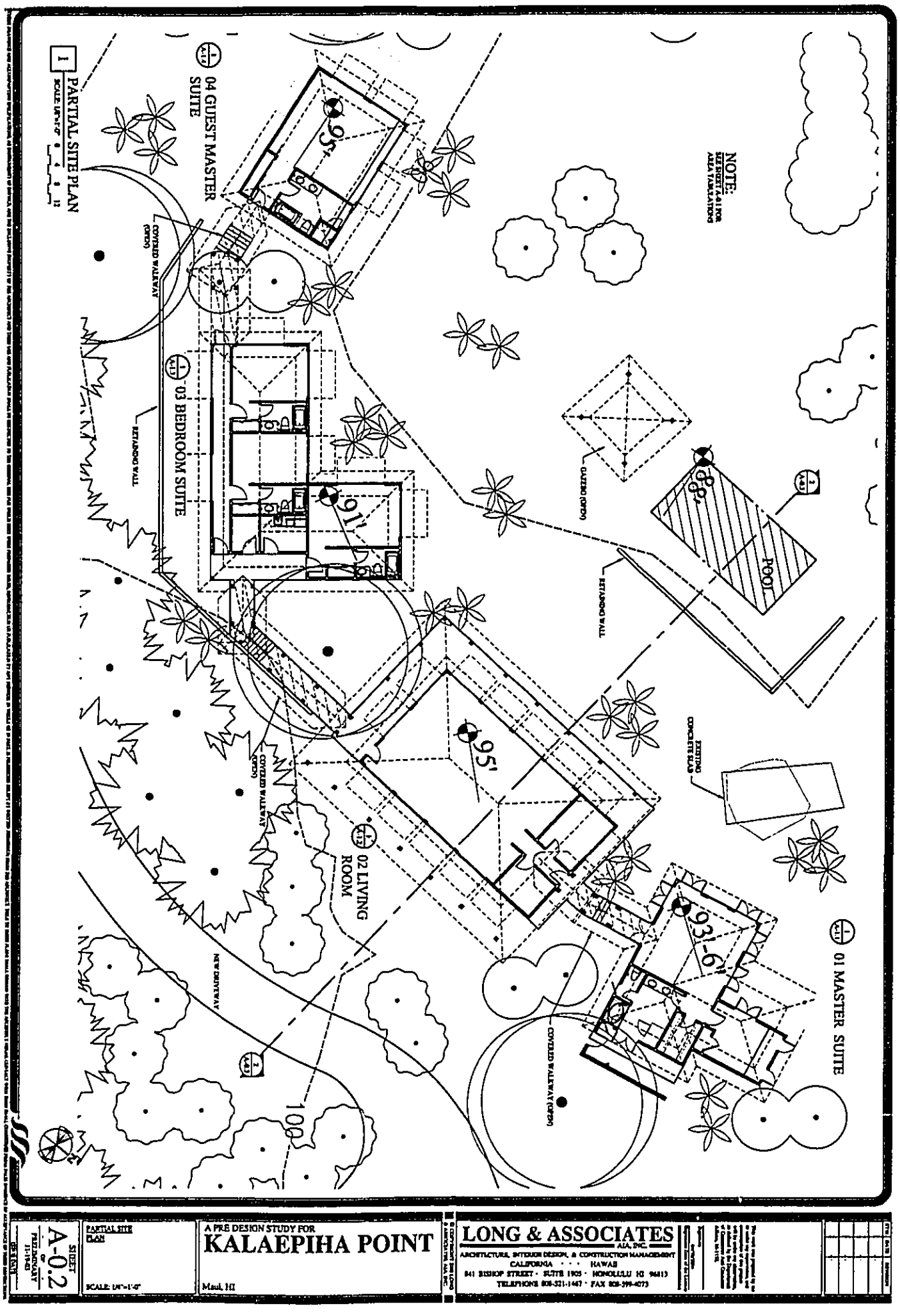
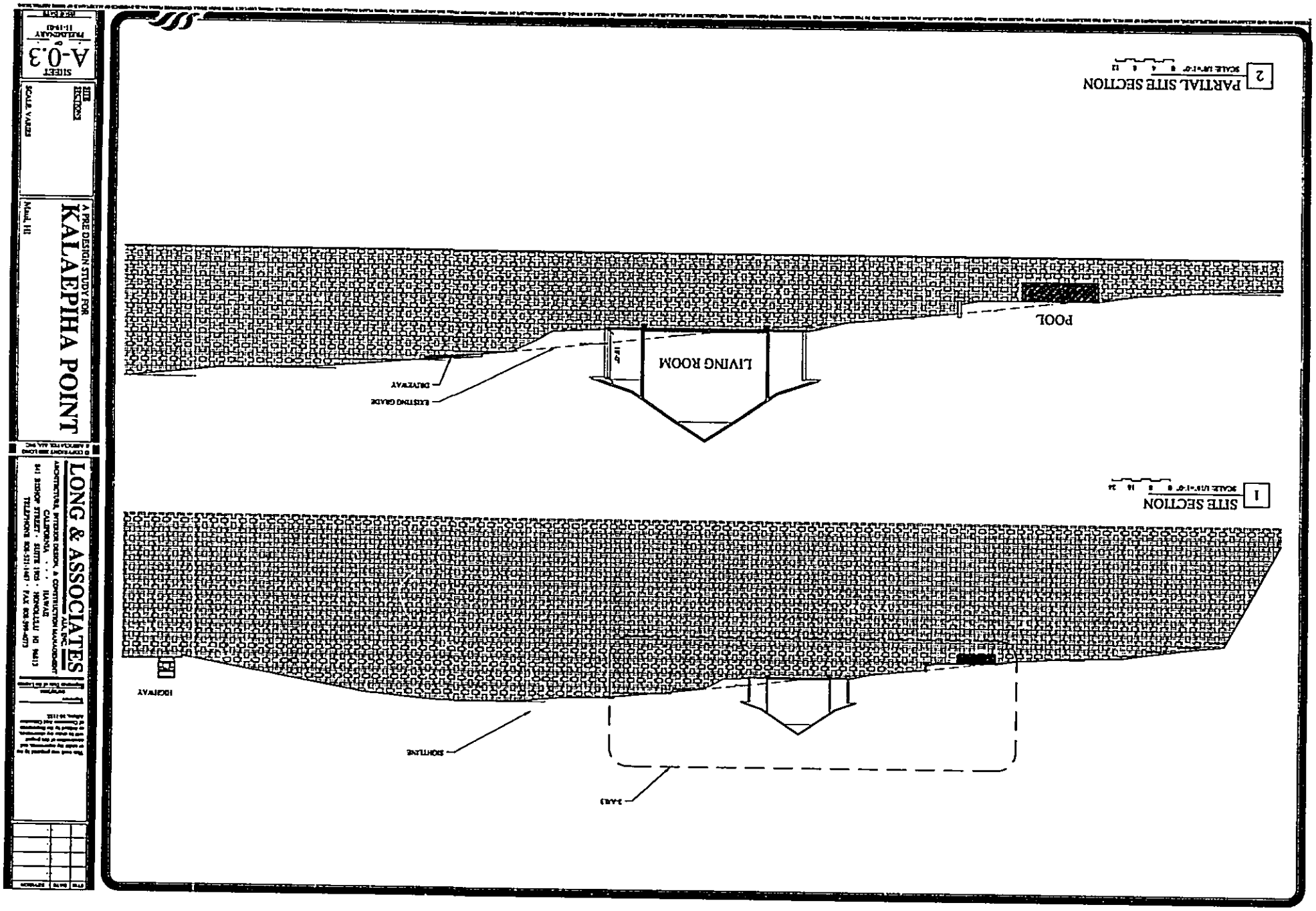


Figure 6b

Figure 6c



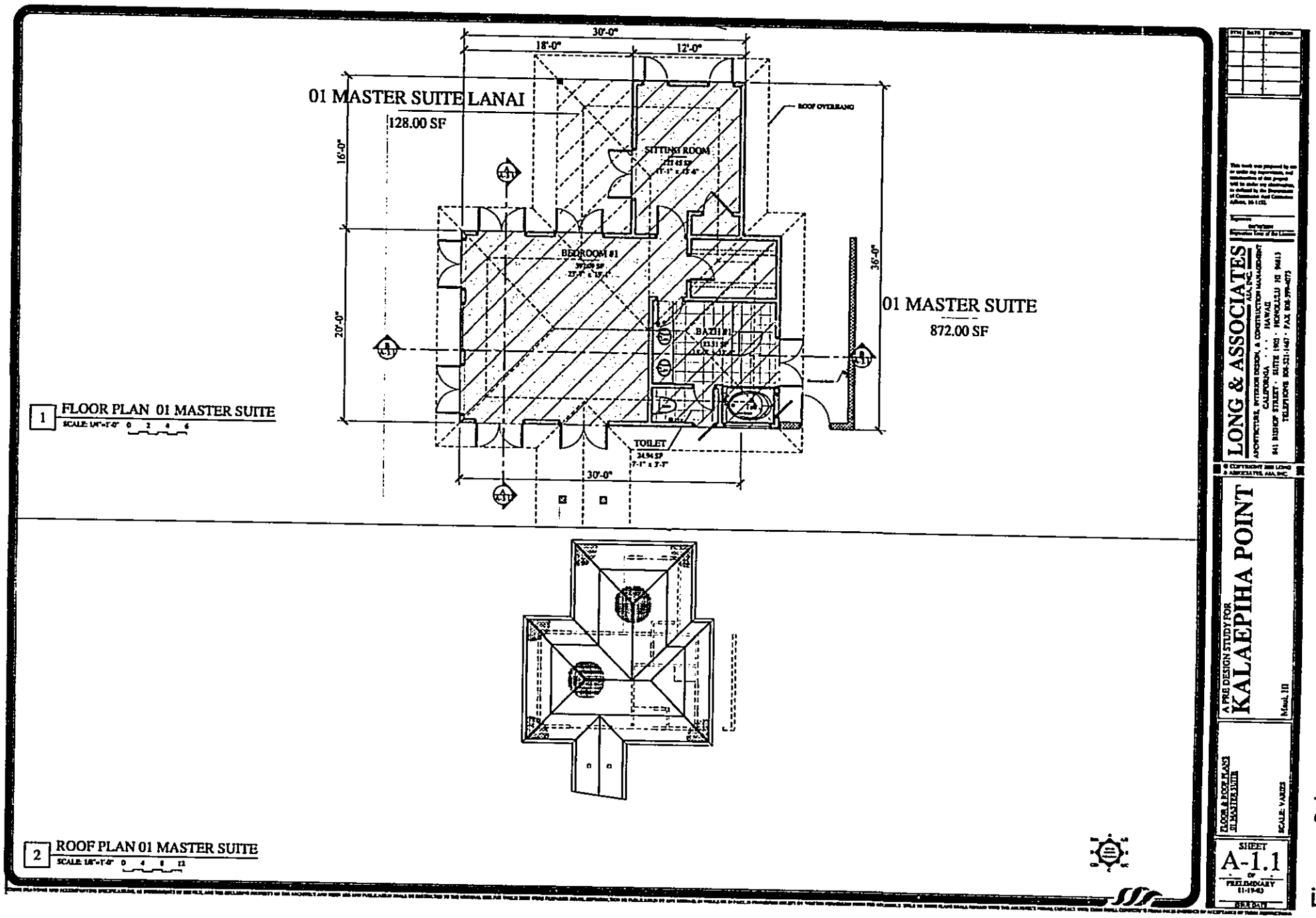
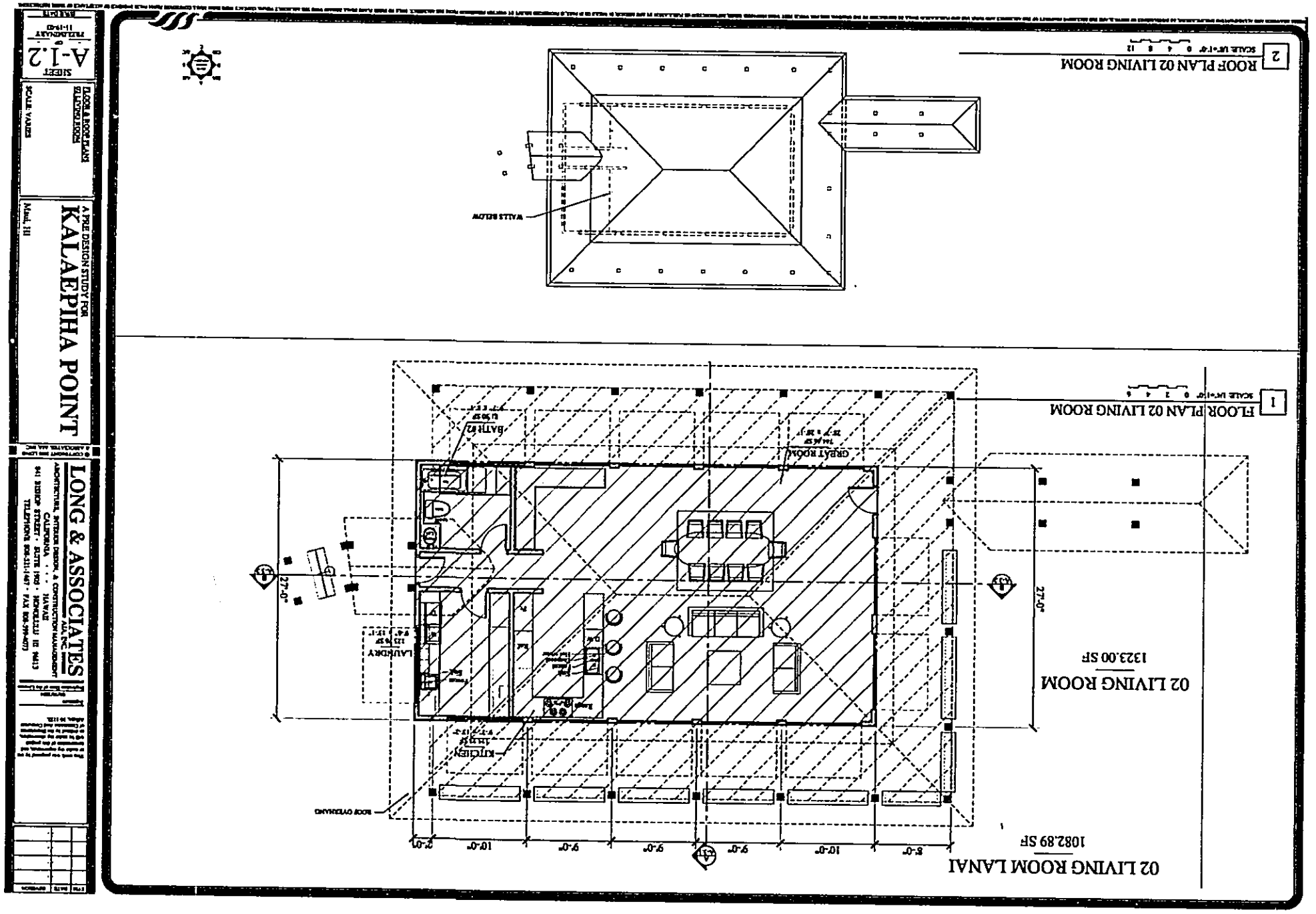


Figure 6d

Figure 6e



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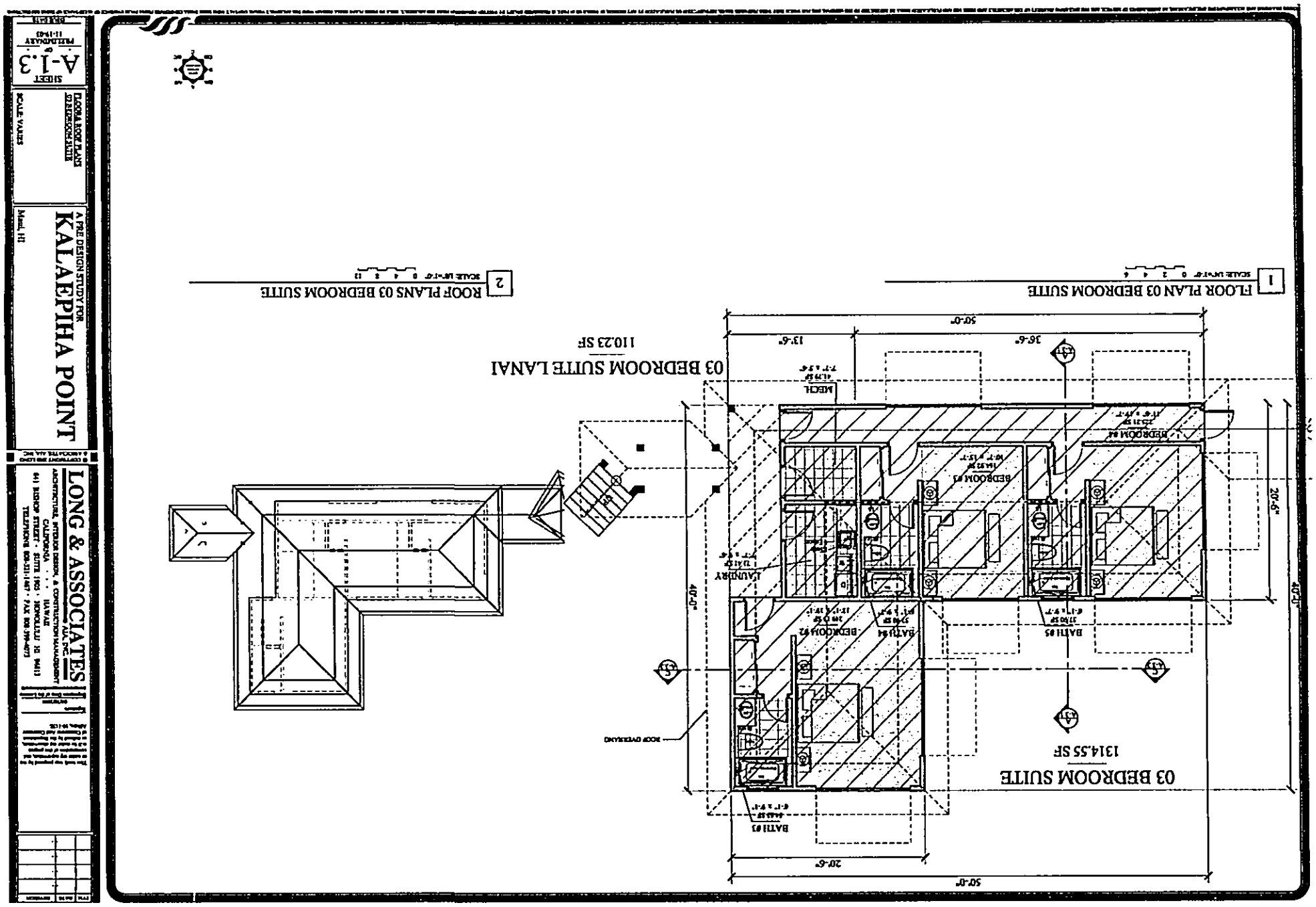

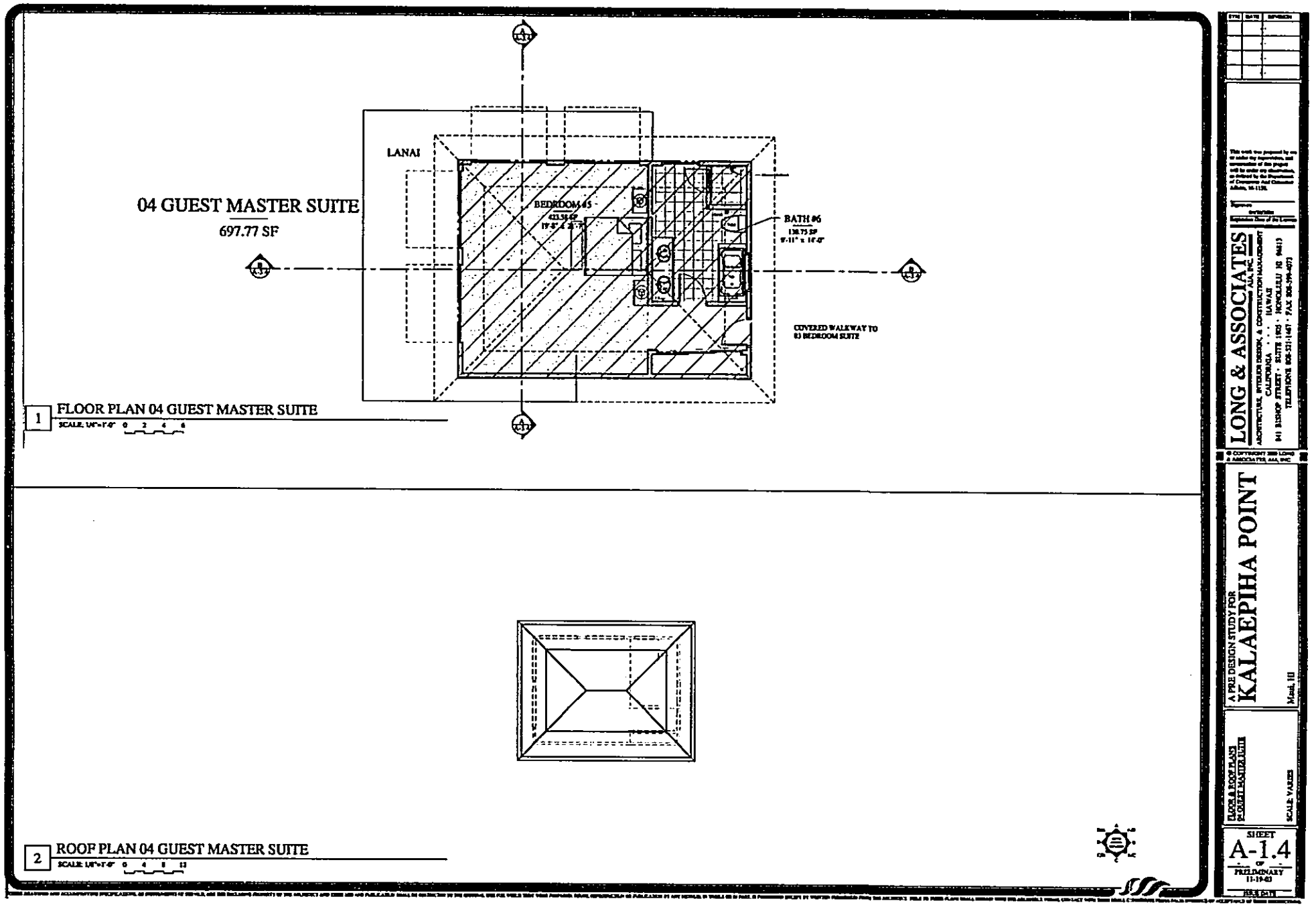

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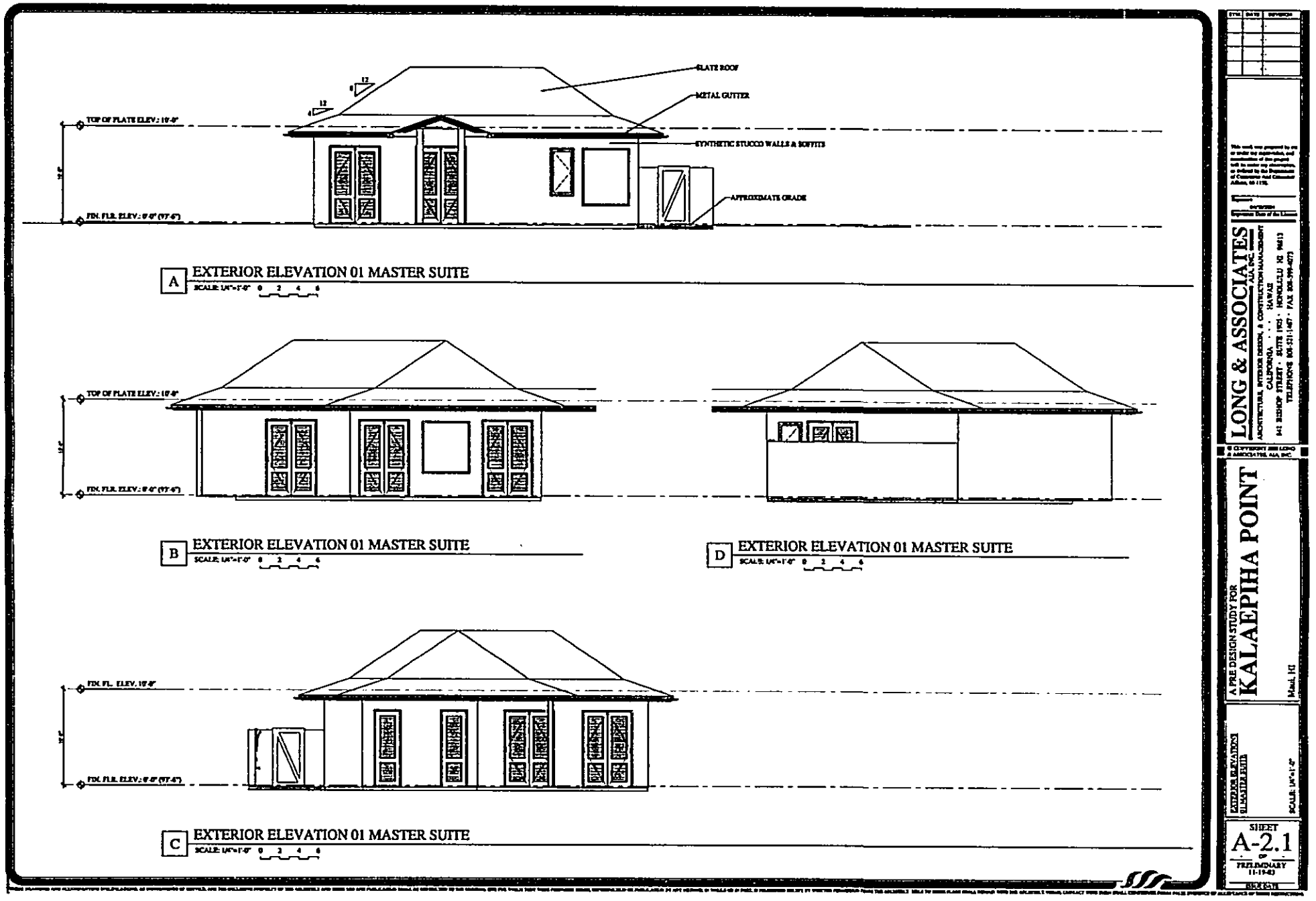


Figure 6h

Figure 6i

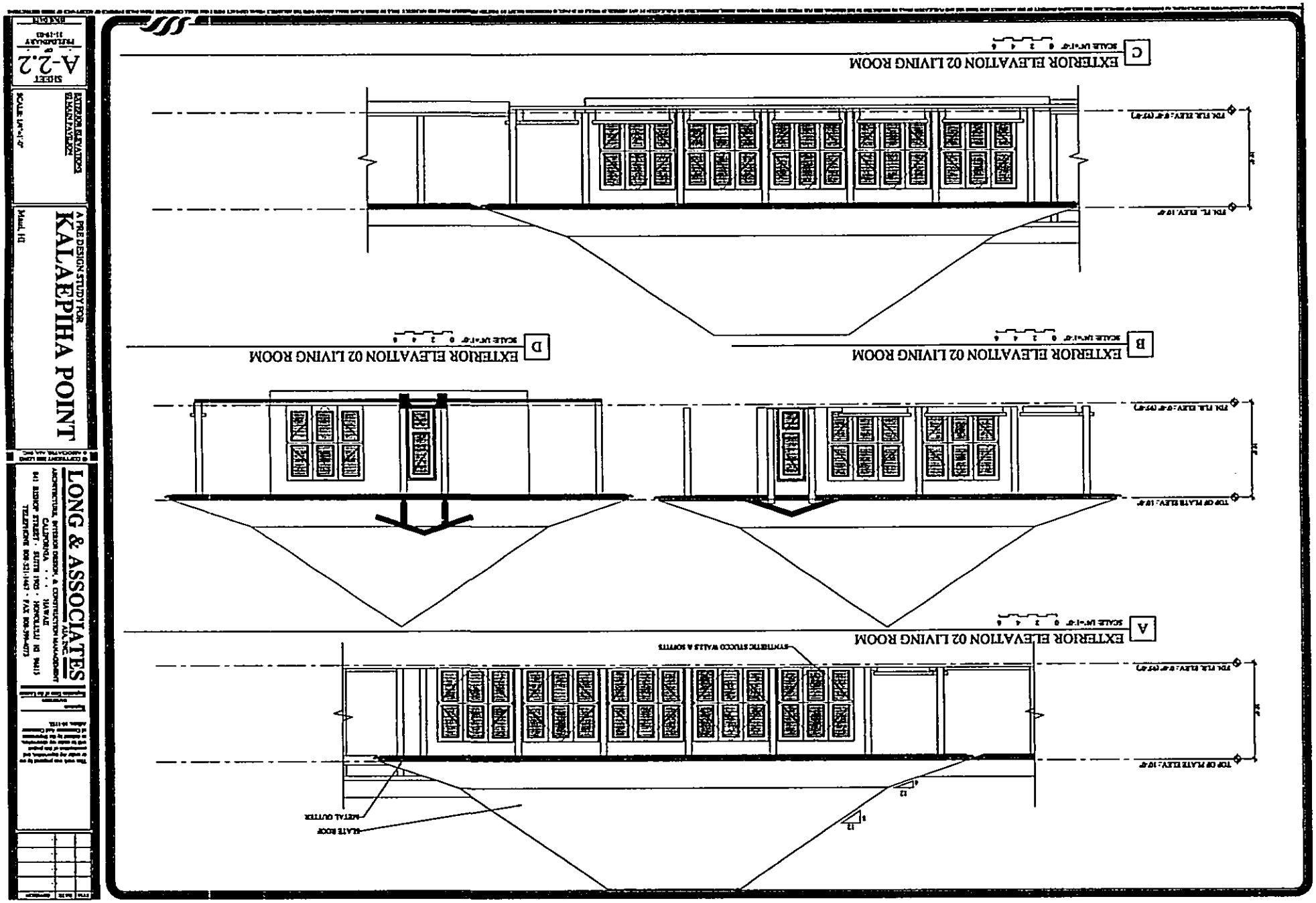


Figure 6j

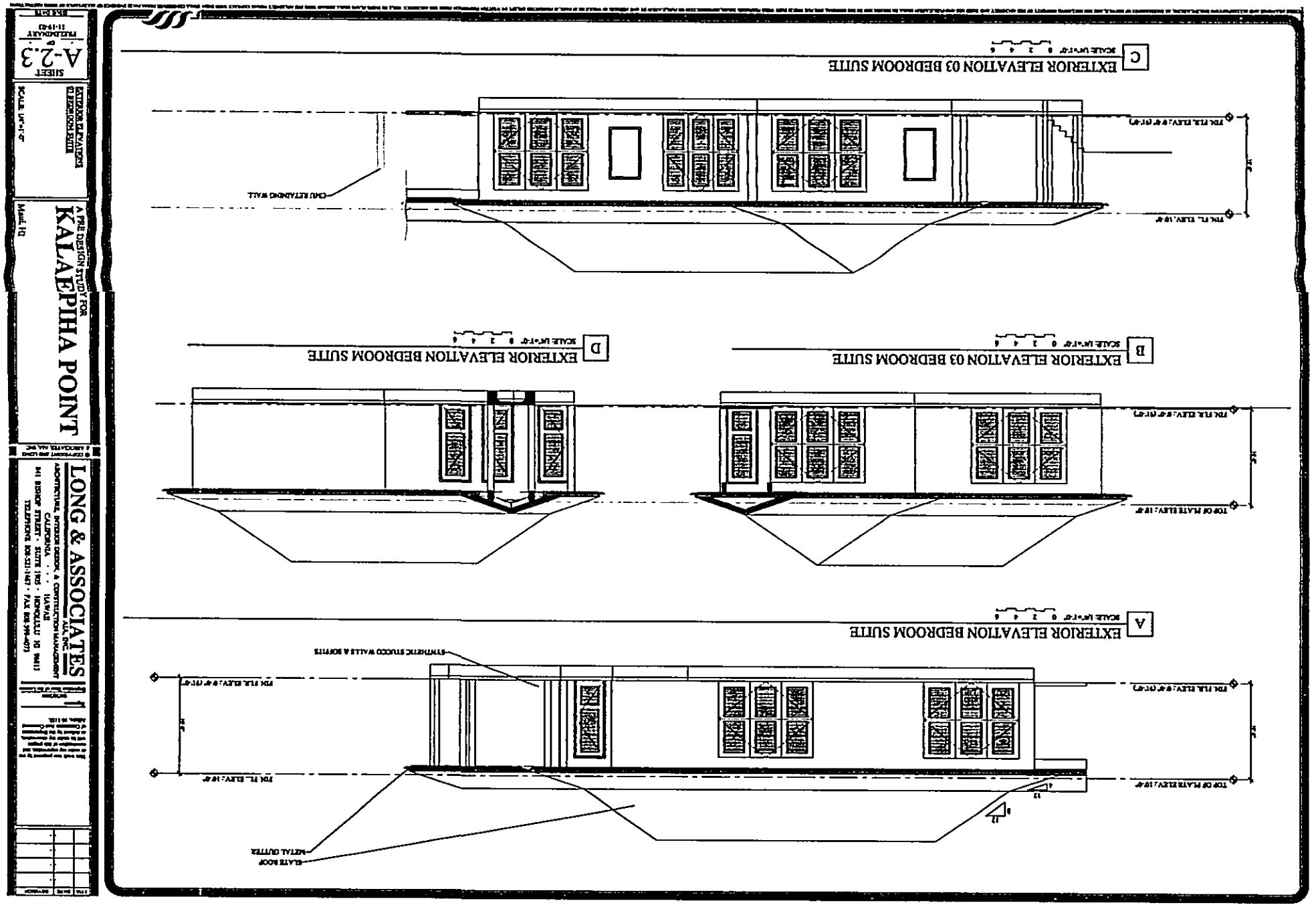


Figure 6k

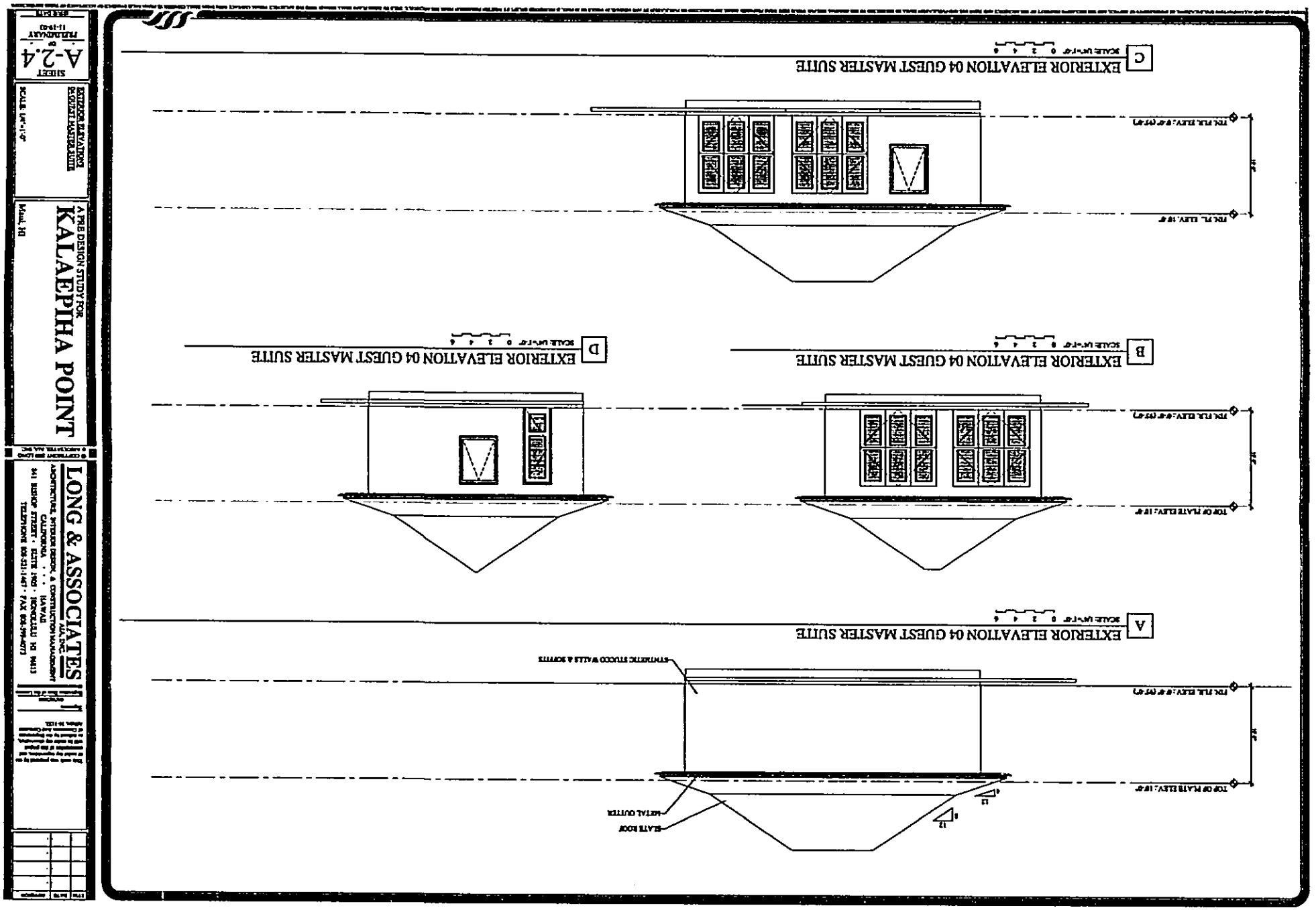
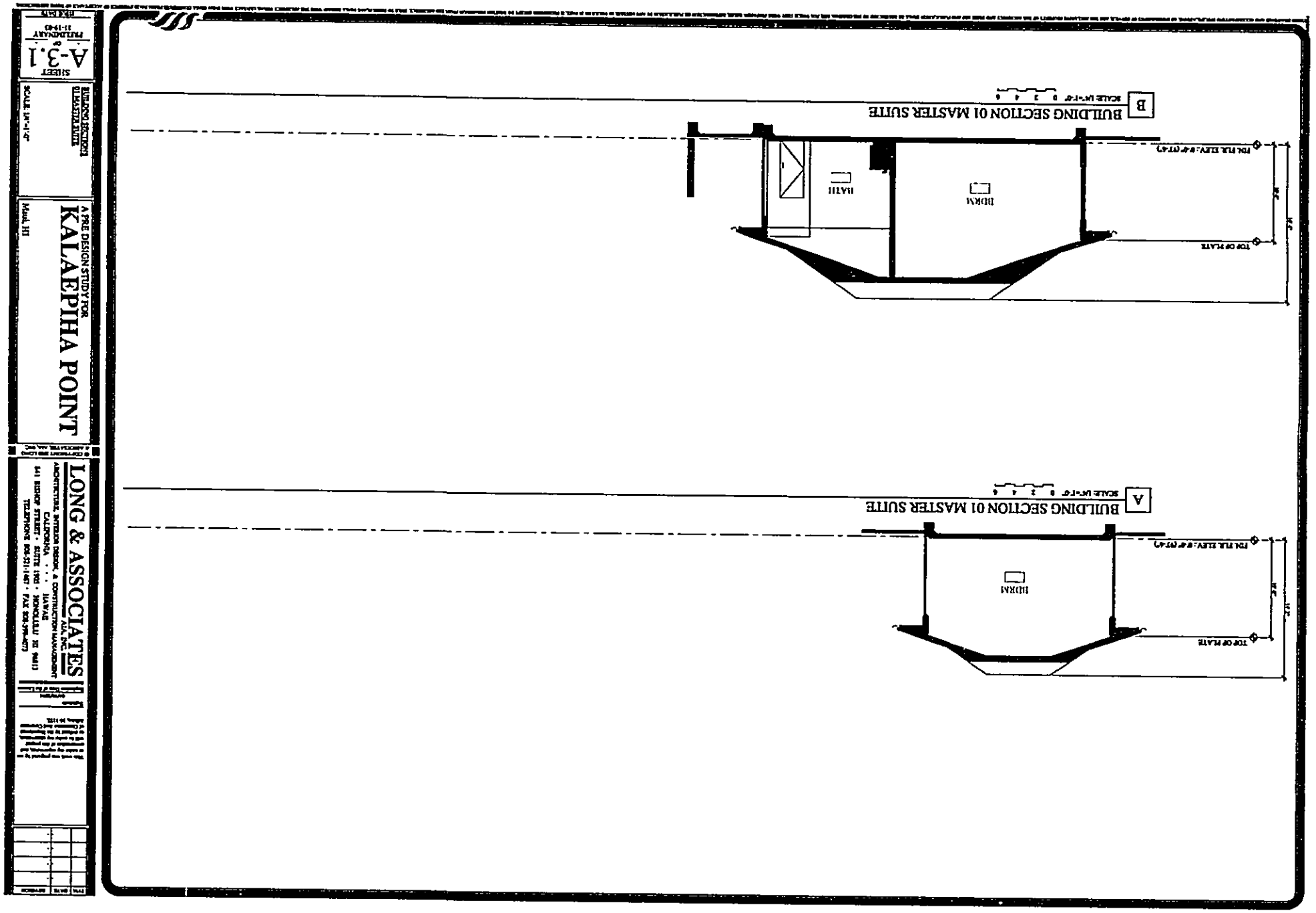


Figure 61



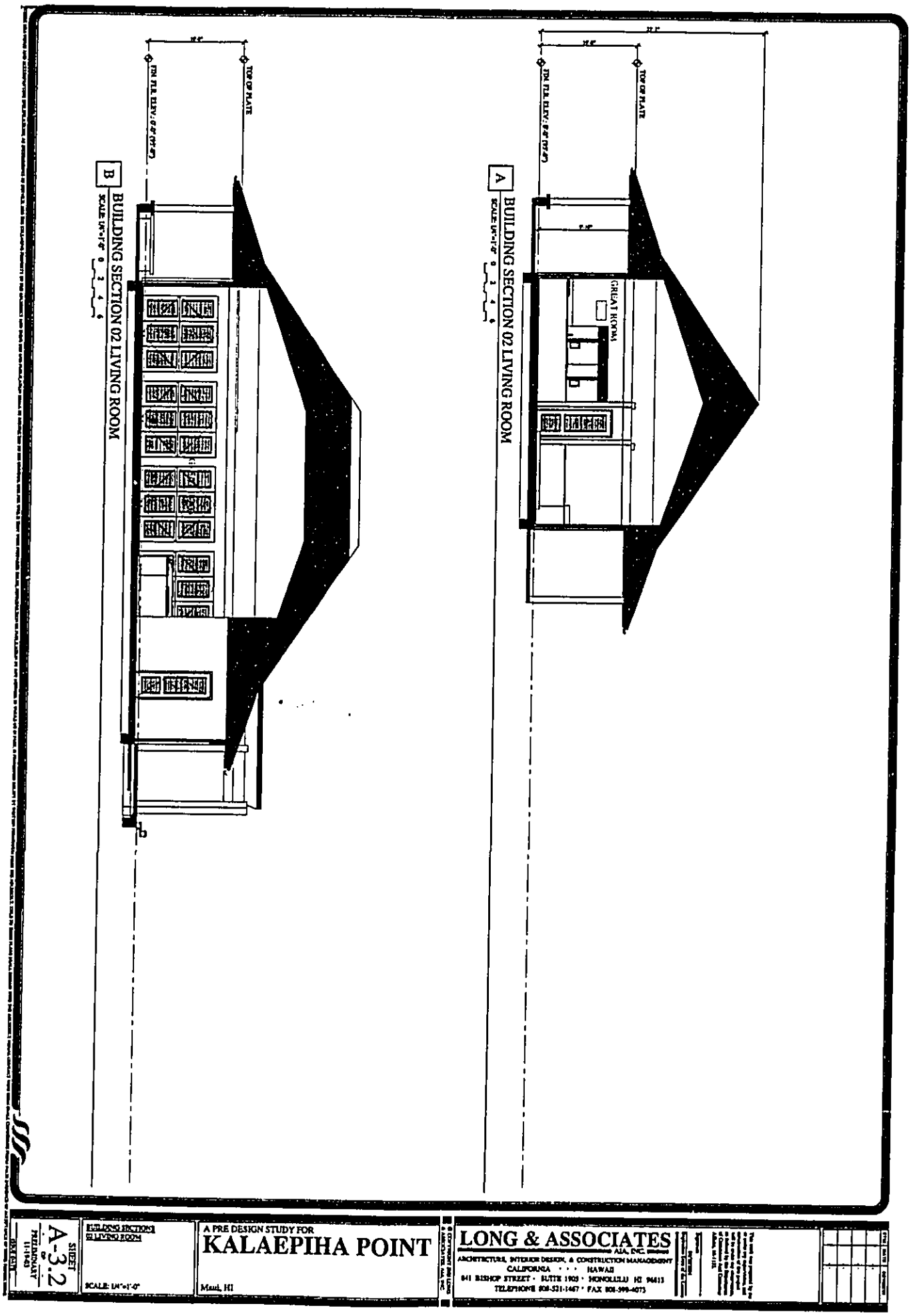
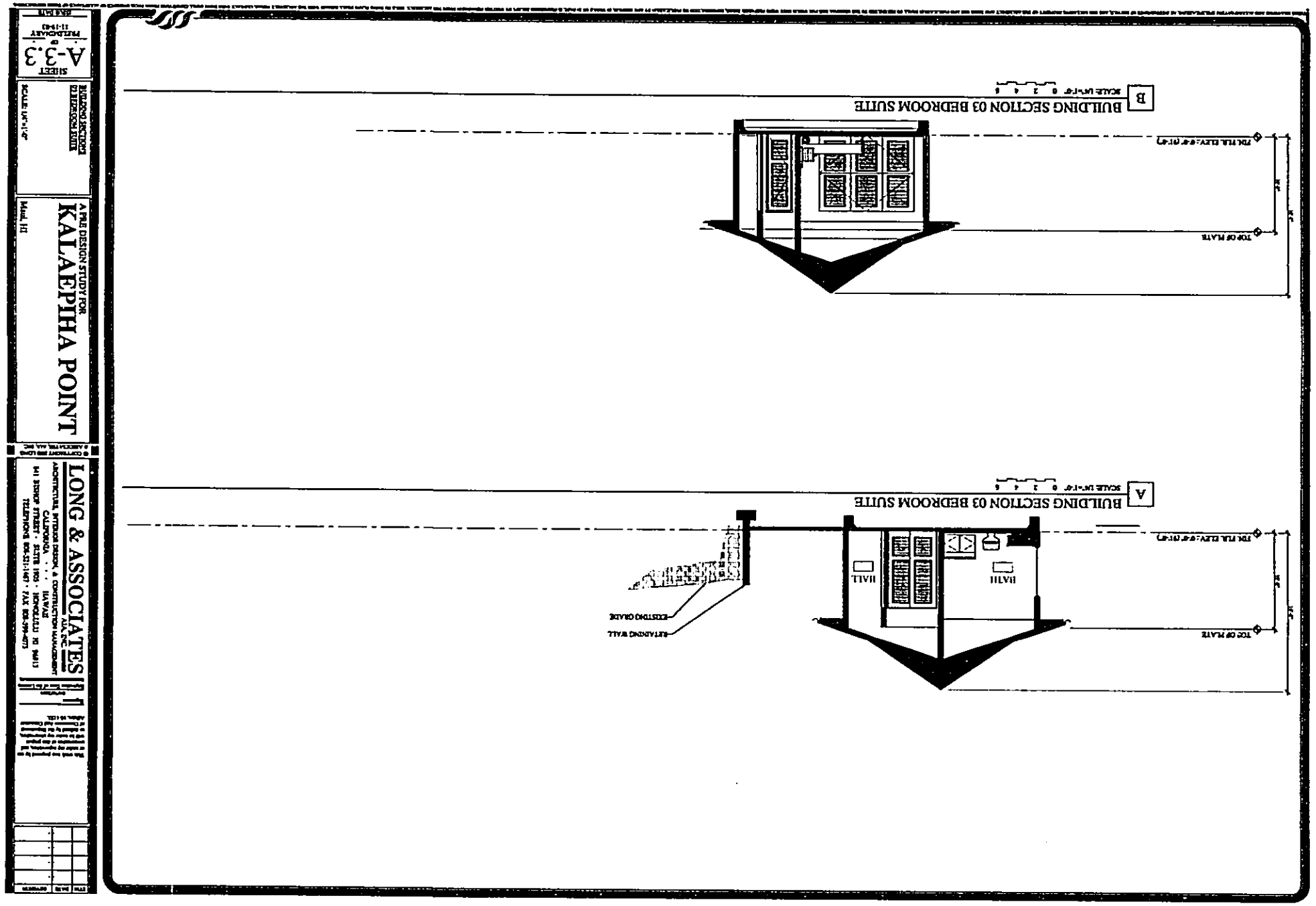
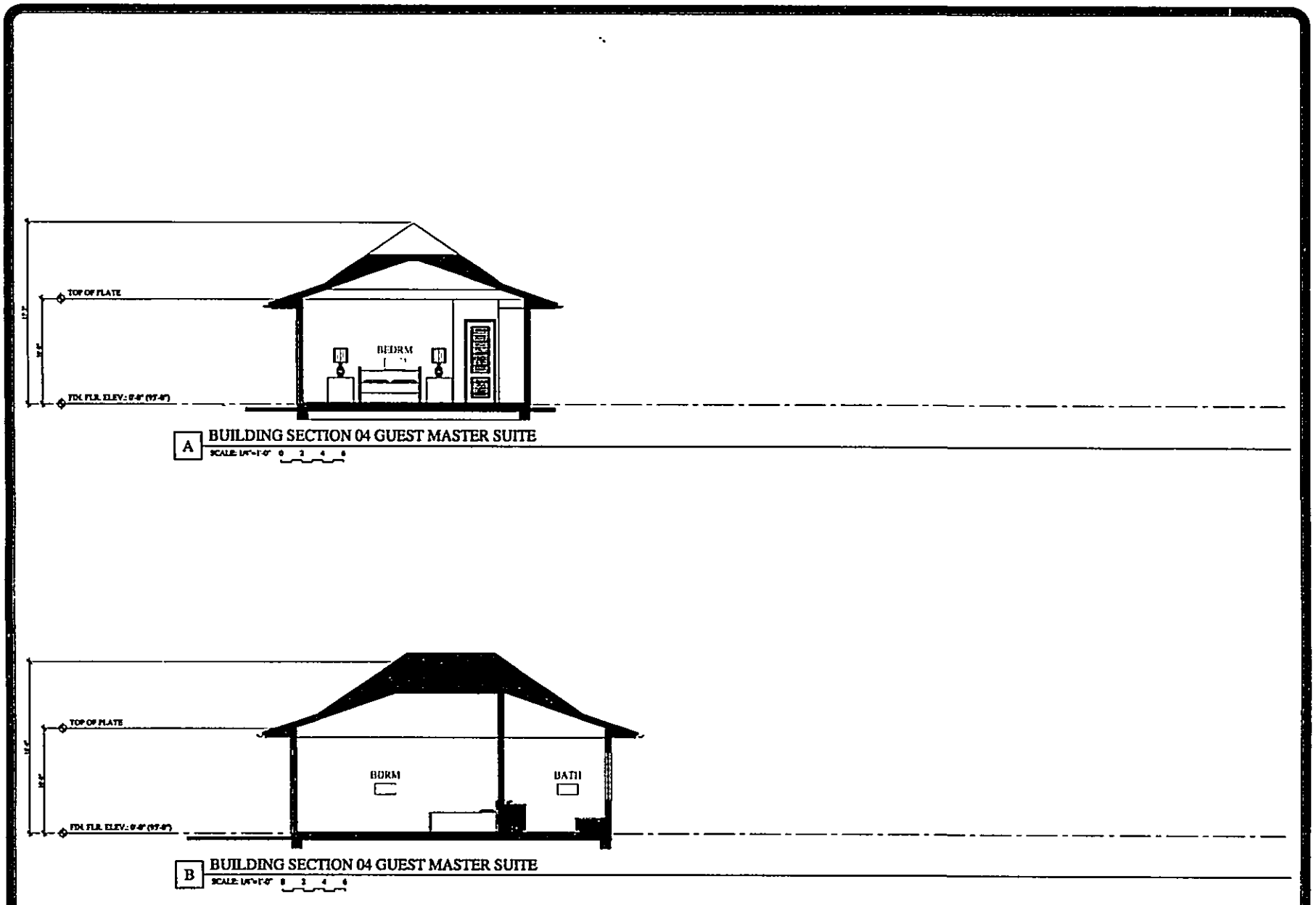


Figure 6m

Figure 6n





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A PRE DESIGN STUDY FOR
KALAEPIHA POINT
Maui, HI

BUILDING SECTION
GUEST MASTER SUITE

SHEET
A-3.4
PRELIMINARY
11-19-03

Figure 6o

impact on the environment. It seeks to improve the region's sustainability by meeting the needs of Hawai'i's residents and visitors today without compromising the needs of future generations."

Where appropriate, techniques from "Guidelines for Sustainable Building Design in Hawai'i: A Planner's checklist" will be considered for inclusion in the Nguyen residence.

2.4 PROJECT TIMETABLE

Construction of the Nguyen single-family residence will begin after approval of required permits, including the Conservation District Board Permit (per HAR Title 13, Department of Land and Natural Resources Subtitle 1 Administration, Chapter 5, Conservation District).

This environmental assessment is being completed as a requirement of the Board Permit application process. Once an application is considered complete by the Department of Land and Natural Resources, a letter of acceptance is issued and the Board Permit application must be processed within a statutory 180-day time period.

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3.0 LAND USE CONFORMANCE

This section describes State of Hawai'i and County of Maui land use plans, policies, and ordinances relevant to the proposed Nguyen single-family residence. Each section includes discussion of how the project conforms to each of the plans and requirements.

3.1 STATE OF HAWAI'I

3.1.1 State Environmental Impact Statement Law, Chapter 343, Hawai'i Revised Statutes

The State Environmental Impact Statement Law (Chapter 343, HRS) requires an environmental assessment be prepared for "any use within any land classified as conservation district." Kalaepīhā Point is within the State Conservation District and this document has been prepared in compliance with the State Environmental Impact Statement Law.

3.1.2 State Land Use Law, Chapter 205, Hawai'i Revised Statutes

The State Land Use Law (Chapter 205, HRS) establishes the State Land Use Commission (LUC). This body has authority to designate all lands in the State into one of four districts: Urban, Rural, Agricultural, or Conservation. As stated above, Kalaepīhā Point is within the State Conservation District (Figure 7).

Chapter 205, HRS delegates authority to govern the Conservation District to the Department of Land and Natural Resources, pursuant to the Conservation District Law (Chapter 183C, HRS). Construction of the Nguyen single-family residence will conform to all requirements associated with the Conservation District designation.

3.1.3 State Conservation District Law, Chapter 183C, Hawai'i Revised Statutes

The State Conservation District Law (Chapter 183C, HRS) requires the Department of Land and Natural Resources to: 1) establish subzones within the Conservation District; 2) adopt Administrative Rules governing the use of land within the Conservation District and the subzones; and 3) regulate land use in the Conservation District by the issuance of permits.

Kalaepīhā Point is within the "Resource" Subzone of the Conservation District (Figure 8). Construction of one single-family residence per parcel is an identified use within the Resource subzone, providing a Board Permit is obtained from the Board of Land and Natural Resources. This final environmental assessment was prepared in partial fulfillment of the requirements for a Board Permit.

3.1.4 State Conservation District Administrative Rules

The State Conservation District Administrative Rules (Hawai'i Administrative Rules, Title 13, Department of Land and Natural Resources, Subtitle 1 Administration, Chapter 5, Conservation) state the objective of the "Resource" Subzone is to "develop, with proper management, areas to ensure sustained use of the natural resources of those [Conservation] areas."

The Rules also provide for identified land uses within the subzones. Accordingly, an identified use in the Resource subzone is "A single family residence that conforms to design standards as outlined in this chapter. [Eff DEC 12 1994] (Auth: HRS §183C-3) (Imp: HRS §183C-4)."

A Board Permit is required from the State Board of Land and Natural Resources (BLNR) before a residential structure can be constructed in the Conservation District. In evaluating the merits of a proposed land use, the Board of Land and Natural Resources applies the criteria listed under Section 13-5-30 of the Rules. Each of the criteria is listed below, followed by discussion of how the proposed Nguyen single-family residence effectively conforms to each.

(1) The proposed land use is consistent with the purpose of the conservation district;

Discussion: The purpose of the Conservation District Rules (according to Section 13-5-1 of the Rules) is "to regulate land use in the conservation district for the purpose of conserving, protecting, and preserving the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare." The Rules also specify that a single-family residence is an identified use in the Resource subzone, provided the Board of Land and Natural Resources approves a Conservation District Use Permit.

The proposed Nguyen single-family residence is consistent with the purpose of the Conservation district in that a single-family residence is an identified use in the Resource subzone and that the resources of the site will be conserved, protected, and preserved after the residence is constructed. As specified in the Rules, the developable area for a single-family residence in the Conservation District is limited to a maximum of 5,000 square feet (including any decks, garages, swimming pools, or other structures).

The design of the Nguyen residence will be sensitive to the site with measures taken to minimize environmental impacts. Considering that the total area of the 6.5-acre site is 283,140 square feet, the residence will occupy less than two percent of the total site. Therefore the majority of the site will be left in its open space condition. In addition, archaeological resources that have been discovered on the site will be preserved and protected through the creation and implementation of a preservation plan and by the creation of buffer zones around specific sites. Relative to the existing un-managed state of the site, a residence will allow for the owner to maintain careful monitoring of site conditions, in effect providing stewardship of the site.

(2) The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur;

Discussion: Kalaepīhā Point is within the Resource subzone. According to the Conservation District Rules, the objective of the Resource subzone is to "develop, with proper management, areas to ensure sustained use of the natural resources of the area."

The Nguyen single-family residence will implement this objective. Relative to the existing un-managed state of the site, a residence will allow for the owner to maintain careful monitoring of site conditions, in effect providing stewardship of the site. The proposed residential structure will be limited to a maximum of 5,000 square feet (including all above grade buildings, decks,

Legend

- Project Site

State Land Use Districts

- Agriculture
- Conservation
- Rural
- Urban
- Streams
- Major Roads

Figure 7
State Land Use Districts
NGUYEN RESIDENCE

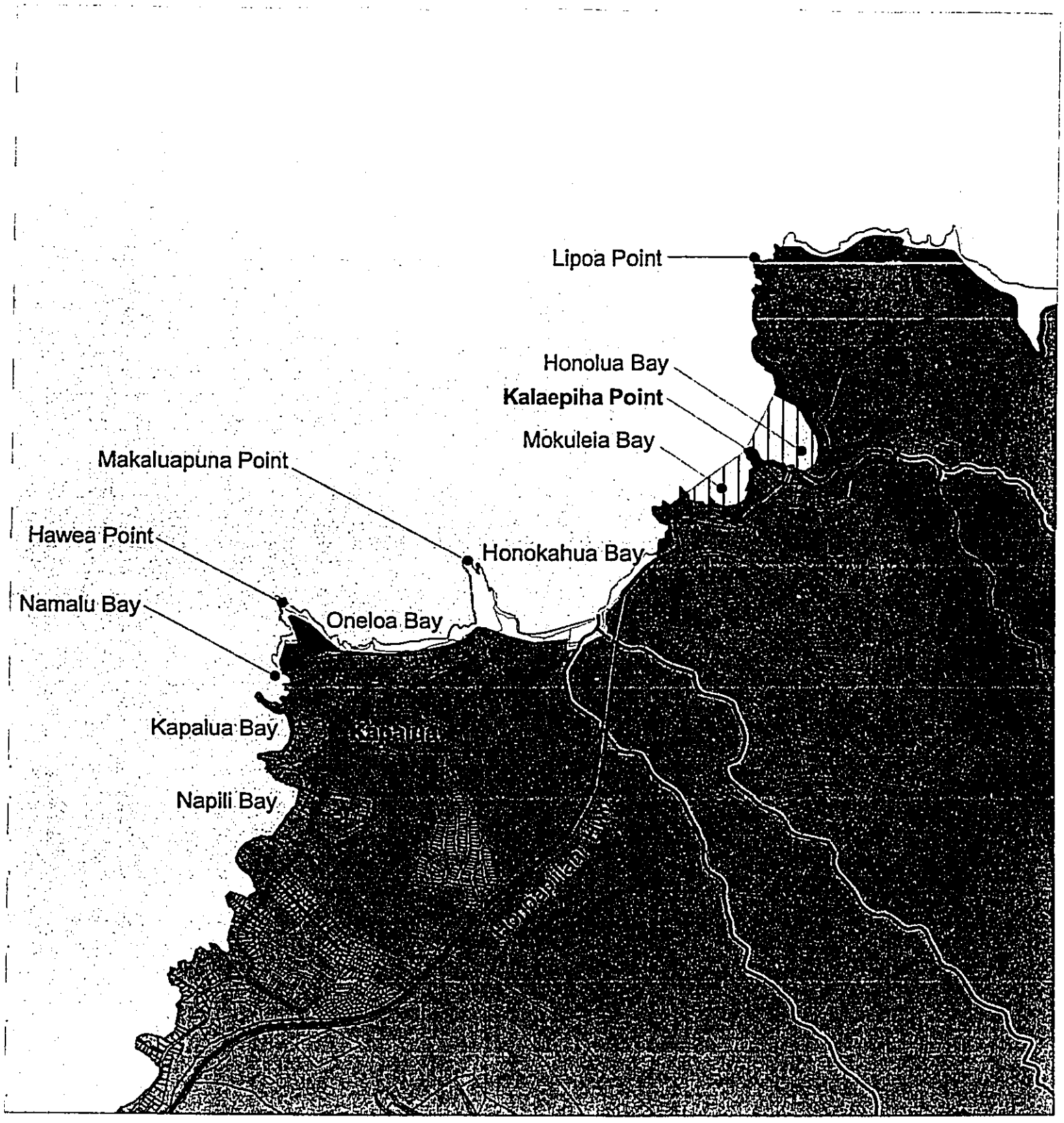
NORTH

LINEAL SCALE (FEET)
1000 0 2000

PBR HAWAII

9/11/03

Source: State Land Use Commission
Q:\Maui\Kalaepiha\GIS\projects\1-14-03.apr



Legend

- Project Site

Conservation District Subzones

- General
- Limited
- Preservation
- Resource
- Non Conservation District
- Streams
- Major Roads

Figure 8
Conservation District Subzones
NGUYEN RESIDENCE

NORTH
LINEAL SCALE (FEET)
1000 0 2000

PBR HAWAII
9/11/03

Source: Department of Land and Natural Resources
Q:\Maui\Kalaepiha\GIS\projects\1-14-03.apr

carports, any other standing structures will be less than 5,000 square feet.), thereby maintaining the majority of the 6.5-acre site in its open space condition. Archaeological resources that have identified for preservation on the site will be preserved and protected through the implementation of a preservation plan and by the creation of buffer zones around specific sites. In addition, shoreline areas will be open to the public and the existing shoreline access will not be restricted or changed.

(3) The proposed land use complies with provisions and guidelines contained in chapter 205A, HRS, entitled "Coastal Zone Management," where applicable;

Discussion: The proposed subdivision of the Nguyen single-family residence at Kalaepīhā Point complies with provisions and guidelines contained in Chapter 205A, HRS, entitled "Coastal Zone Management," by:

1) Protecting and preserving archaeological resources;
2) Protecting, preserving, or improving the quality of coastal scenic and open space resources;
3) Protecting valuable coastal ecosystems and minimizing adverse impacts on all coastal ecosystems;

The Kalaepīhā Point property is within the Special Management Area (SMA) of the County of Maui (Figure 9). However, under Section 205A-22, *Hawai'i Revised Statutes*, construction of a single-family residence is exempt from the SMA requirements.

(4) The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community, or region;

Discussion: The Nguyen single-family residence will not cause substantial adverse impact to existing natural resources within the surrounding area, community, or region. The design and construction of the residence will be sensitive to the site with measures taken to minimize environmental impacts. The relative small area of the residence will minimize the need for extensive grading or contouring of the site. Mitigative measures will be implemented to ensure that no impacts to the surrounding marine resources occur due to alterations in storm run-off conditions.

In addition, current vegetation within the property along the highway obscures views of the ocean from the highway. The proposed house site is on a relatively level portion of the property that is setback from Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway.

(5) The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.

The Nguyen single-family residence will be compatible with the locality and surrounding areas. The design and construction of the residence will be sensitive to the site. The location of the residence on the property is on a portion of the parcel that is set back from the adjacent

Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway.

In accordance with the Conservation District Rules the residence will be limited to a maximum height of 25 feet and a maximum area of 5,000 square feet (including any decks, garages, swimming pools, or other structures). Considering that the total area of the 6.5-acre site is 283,140 square feet, the residence will occupy less than two percent of the total site. Further, design considerations will include selecting earth tone paints and surface colors for the structure and roof so as to blend with the surrounding area, and limiting grading and/or contouring of the property. Landscaping for the residence will incorporate much of the existing on-site vegetation and additional landscaping will be compatible with the existing environment.

(6) The existing physical and environmental aspects of the land such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable,

Discussion: Primary scenic views of the region will not be significantly affected by the Nguyen residence. For example, the primary view of Honolua Bay upon driving north along Honoapi'ilani Highway will not be obscured by the residence. Likewise, driving south, the residence will be screened from the highway as bluffs and the current vegetation within the property obscure views of the ocean from the highway in front of the property. Additionally, the proposed house site is on a relatively level portion of the property that is setback from Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway.

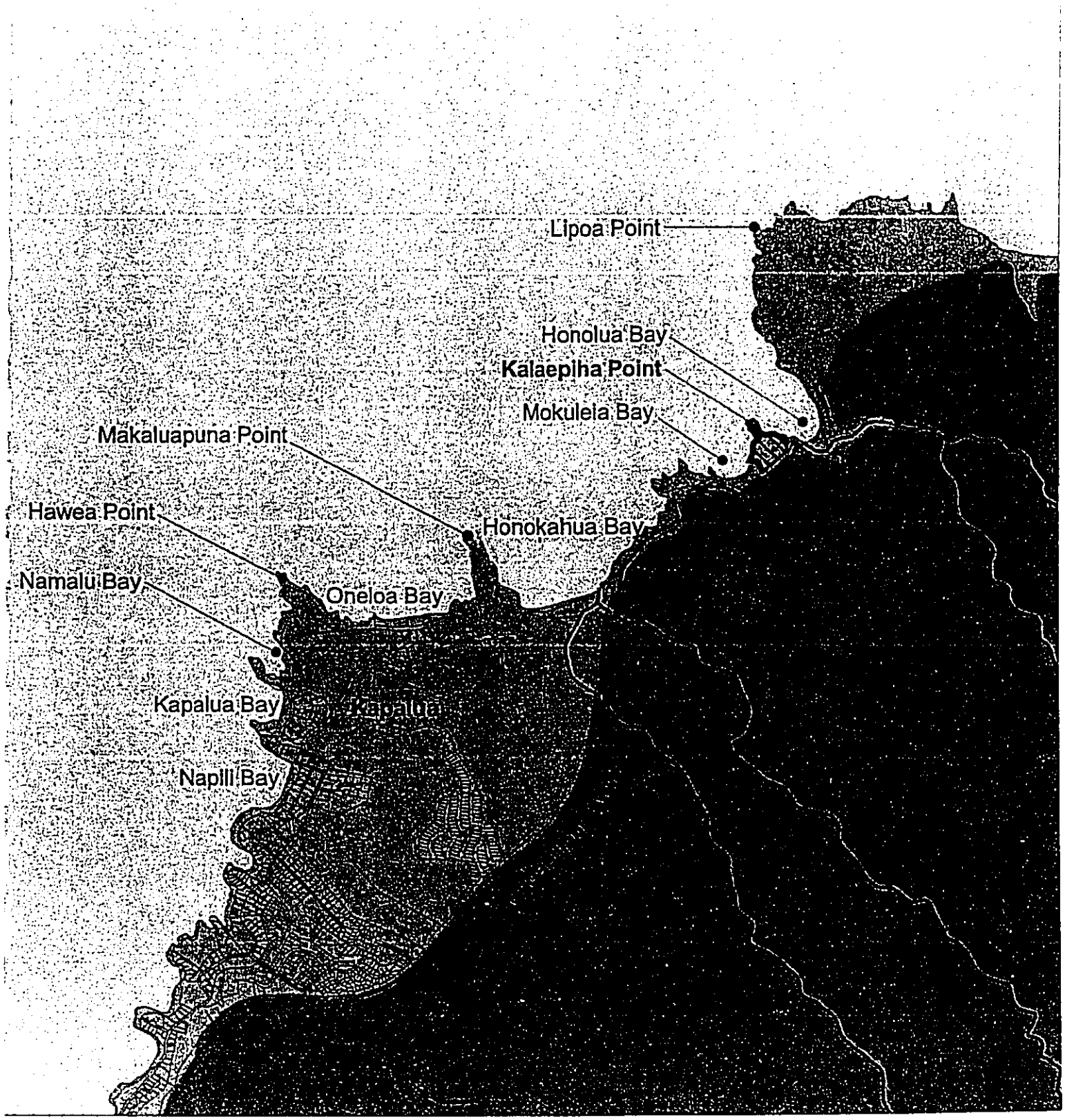
Because the residence will occupy less than two percent of the total site, there will not be significant impacts to the open space characteristics of the site. In addition, the high cliffs on the shoreline perimeter of the parcel, combined with the setback of the residence from the cliff edge, will limit the sight of the residence from view plains at neighboring Mokulē'ia Beach and other adjacent coastline areas. Shoreline areas will be open to the public and the existing shoreline access will not be restricted or changed.

(7) Subdivision of land will not be utilized to increase the intensity of land uses in the conservation district; and

Discussion: The construction of a single-family residence on the Kalaepīhā Point parcel does not involve subdivision of land in the Conservation District.

(8) The proposed land use will not be materially detrimental to the public health, safety and welfare.

Discussion: The Nguyen single-family residence will not be detrimental to the public health, safety and welfare as all phases of design and construction will comply with all appropriate government requirements with regard to environmental and public health concerns. Subsequent portions of this environmental assessment identify all potential impacts and discuss appropriate mitigative measures to ensure that no significant detrimental effects on public health, safety, or welfare result from the construction of the Nguyen single-family residence.



Legend

- Project Site
- Special Management Area
- Streams
- Major Roads

Figure 9
Special Management Area
NGUYEN RESIDENCE

NORTH
LINEAL SCALE (FEET)
1000 0 2000

PBR HAWAII
9/11/03

Source: County of Maui
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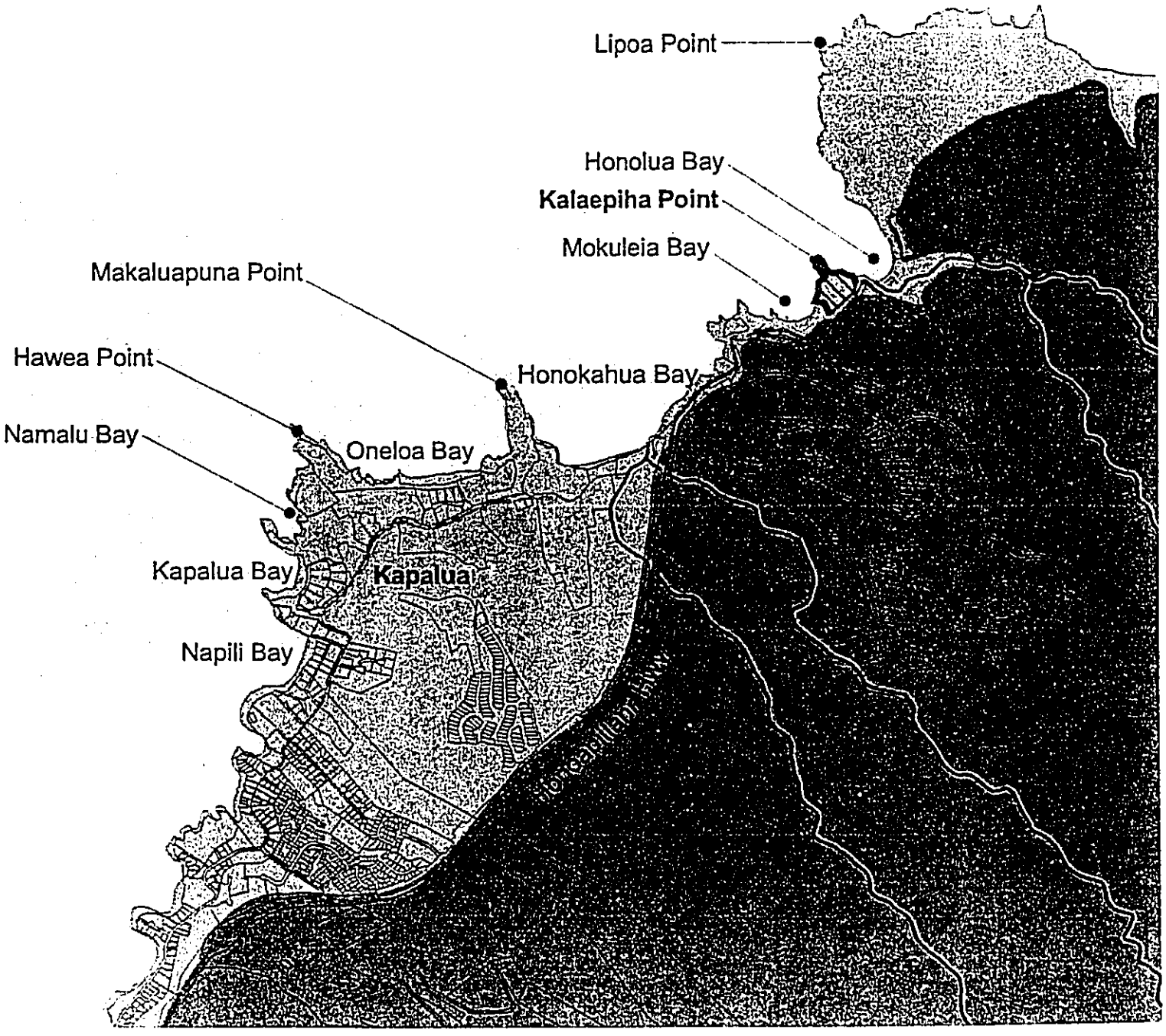

Legend
- Project Site
- Special Management Area
- Streams
- Major Roads

Figure 9
Special Management Area
NGUYEN RESIDENCE

NORTH
LINEAL SCALE (FEET)
1000 0 2000
PBR HAWAII
9/11/03

Source: County of Maui
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3.2 COUNTY OF MAUI

County-specific land use plans and ordinances pertaining to the proposed Nguyen single-family residence include the *General Plan of the County of Maui 1990 Update*, the *West Maui Community Plan*, and the Maui County Code. The following subsections present relevant elements of these guidelines and regulations, accompanied with description of how each will be addressed during the course of the proposed project.

3.2.1 General Plan

The County of Maui Charter requires that the Maui General Plan address the development-related needs and concerns of the citizens of Maui County. In so doing, it must set forth the desired patterns and characteristics of future growth, and assess the social, economic, and environmental effects of such change. Various objectives and policies have been established in the Plan to satisfy these goals. The proposed Nguyen single-family residence is consistent with the following General Plan objectives and policies:

I. POPULATION, LAND USE, THE ENVIRONMENT AND CULTURAL RESOURCES

B. Land Use

Objective 1: *To preserve for present and future generations existing geographic, cultural and traditional community lifestyles by limiting and managing growth through environmentally sensitive and effective use of land in accordance with the individual character of the various communities and regions of the county.*

Policy b: *Provide and maintain a range of land use districts sufficient to meet the social, physical, environmental and economic needs of the community.*

Policy c: *Identify and preserve significant historic and cultural sites.*

Objective 2: *To use the land within the County for the social and economic benefit of all the County's residents.*

Policy a: *Mitigate environmental conflicts and enhance scenic amenities, without having a negative impact on natural resources.*

Discussion: Given the fact that development on the site will be limited to one single-family residence with a floor area no greater than 5,000 square feet (including all above grade buildings, decks, carports, or other standing structures) and a height no greater than 25 feet, construction of the proposed residence will not significantly alter the desirable attributes of northwest portion of West Maui. Land use in the region is characterized by low-density development, open space, and numerous ocean recreational opportunities. The Nguyen single-family residence will not conflict with these regional characteristics. The design and limited size of the residence, combined with surrounding landscaping, will ensure that the majority of the site will be left in its open space condition. In addition, archaeological resources that have been identified for preservation on the site will be preserved and protected through the creation and implementation of a preservation plan and by the creation of buffer zones around specific sites.

C. Environment

Objective 1: *To preserve and protect the County's unique and fragile environmental resources.*

Policy a: *Preserve for present and future generations the opportunity to experience the natural beauty of the islands.*

Policy b: *Preserve scenic vistas and natural features.*

Policy e: *Discourage the introduction of noxious foreign species into Maui County's unique island ecosystems.*

Objective 2: *To use the County's land-based physical and ocean-related coastal resources in a manner consistent with sound environmental planning practice.*

Policy b: *Evaluate all land-based development relative to its impact on the County's land and ocean ecological resources.*

Policy d: *Discourage all types of shoreline development that impact on traditional community or native activities which include food gathering, religious and recreational uses.*

Discussion: The Nguyen single-family residence will be sensitive to the site with measures taken to minimize environmental impacts. Because the residence will occupy less than two percent of the total site, there will not be significant impacts to the open space or scenic characteristics of the site. The proposed house site is set back from the adjacent Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway. In addition, the high cliffs on the shoreline perimeter of the parcel, combined with the setback of the residence from the cliff edge, will limit sight of the residence from view plains at neighboring Mokulē'ia Beach and other adjacent coastline areas. Landscaping for the residence will incorporate much of the existing on-site vegetation and additional landscaping will be compatible with the existing environment.

Cultural Resources

Objective 1: *To preserve for present and future generations the opportunity to know and experience the arts, culture and history of Maui County.*

Policy b: *Encourage the recordation and preservation of all cultural and historic resources, to include culturally significant natural resources.*

Discussion: Archaeological resources that have been identified for preservation on the site will be preserved and protected through the implementation of a preservation plan and by the creation of buffer zones around specific sites. An archaeological survey of the property was completed in January 2002 (see Appendix A). The State Historic Preservation Division accepted this archaeological survey in June 2002. Maui Land & Pineapple Company, Inc., and the future

landowner will comply will all state and county laws and rules regarding the preservation of cultural and historic sites.

III. HOUSING AND URBAN DESIGN

A. Housing

Objective 1: *To provide a choice of attractive, sanitary and affordable homes for all of our residents.*

Policy b: *Encourage the construction of housing in a variety of price ranges and geographic locations.*

Discussion: The design of the Nguyen residence will be sensitive to the site with measures taken to minimize environmental impacts. Design considerations will include selecting earth tone paints and surface colors for the structure and roof so as to blend with the surrounding area, and limiting grading and/or contouring of the property. Landscaping for the residence will incorporate much of the existing on-site vegetation and additional landscaping will be compatible with the existing environment.

B. Urban Design

Urban Design Objective 1: *To see that all developments are well designed and are in harmony with their surroundings.*

Policy b: *Require that appropriate principles of urban design be observed in the planning of all new developments.*

Urban Design Objective 2: *To encourage developments which reflect the character and the culture of Maui County's people.*

Policy b: *Encourage community design which establish a cohesive identity.*

Discussion: The Nguyen single-family residence will be sensitive to the site and in harmony with the surrounding area. Design considerations will include selecting earth tone paints and surface colors for the structure and roof so as to blend with the surrounding area, and limiting grading and/or contouring of the property. Considering that the total area of the 6.5-acre site is 283,140 square feet, the residence will occupy less than two percent of the total site. Landscaping will incorporate much of the existing on-site vegetation and additional landscaping will be compatible with the existing environment.

The surrounding area includes Plantation Estates directly across Honoapi'ilani Highway and a shoreline single-family residence (Brennan Residence) to the south of the Kalaepīhā Point property. Kapalua Resort's Plantation Golf Course is also nearby. With these uses, the immediate area—while rural—is also residential in nature. A single-family residence on the Kalaepīhā Point property would be in accord with these surroundings.

3.2.2 West Maui Community Plan

The West Maui Community Plan is one of nine community plans developed to address both the general policies of the Maui County General Plan and the unique aspects of each region. This section outlines relevant goals, objectives, and policies of the West Maui Community Plan, and reviews the various ways in which the Nguyen single-family residence is consistent with these.

LAND USE

> *Goal*
> *An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for the stable social and economic well-being of residents and the preservation and enhancement of the region's open space areas and natural environmental resources.*
>
> ***Objectives and Policies***
> 2. *Preserve and enhance the mountain and coastal scenic vistas and open space areas of the region.*
>
> 5. *Preserve the current State Conservation District and the current State Agriculture District boundaries in the planning region, in accordance with this community plan and its land use map. Lands north of Kapalua and south of Puamana to the region's district boundaries should ensure the preservation of traditional lifestyles, historic sites, agriculture, recreational activities and open space.*

Discussion: The Nguyen residence does not require taking the lands out of the State Conservation District nor will it interfere with the preservation of traditional lifestyles, historic sites, agriculture, recreational activities, or open space in the area.

The Nguyen residence will occupy less than two percent of the total site, thereby maintaining the majority of the 6.5-acre site in open space. The Nguyen residence will not affect primary scenic views of the region. For example, the primary view of Honolua Bay upon driving north along Honoapi'ilani Highway will not be obscured by the residence. Likewise, driving south, the residence will not be visible from the highway as the current vegetation within the property obscures views of the ocean from the highway in front of the property.

The proposed house site is on a relatively level portion of the property that is setback from Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway. The high cliffs on the shoreline perimeter of the parcel, combined with the setback of the residence from the cliff edge, will limit the sight of the residence from view plains at neighboring Mokulē'ia Beach and other adjacent coastline areas.

Shoreline areas will be open to the public and the existing shoreline access will not be restricted or changed. All historic and archaeological resources that have been identified for preservation on the site will be preserved and protected through the creation and implementation of a preservation plan and by the creation of buffer zones around specific sites.

ENVIRONMENT

Goal
A clean and attractive physical, natural and marine environment in which man-made developments on or alterations to the natural and marine environment are based on sound environmental and ecological practices, and important scenic and open space resources are preserved and protected for public use and enjoyment.

Objectives and Policies

2. *Preserve agricultural lands and open space with particular emphasis on natural coastal areas along major highways.*

3. *Protect the quality of nearshore and offshore waters. Monitor outfall systems, streams and drainage ways and maintain water quality standards. Continue to investigate, and implement appropriate measures to mitigate, excessive growth and proliferation of algae in nearshore and offshore waters.*

4. *Emphasize land management techniques such as natural landscaping, regular maintenance of streams and drainage ways and siltation basins, avoidance of development in flood-prone areas, and other measures that maintain stream water quality. Whenever feasible, such management techniques should be used instead of structural solutions, such as building artificial stream channels or diversion of existing natural streams.*

5. *Encourage soil erosion prevention measures and the installation of siltation basins to minimize downstream sedimentation and degradation of nearshore and offshore water quality.*

14. *Protect the shoreline and beaches by preserving waterfront land as open space wherever possible. This protection shall be based on a study and analysis of the rate of shoreline retreat plus a coastal hazard buffer zone. Where new major waterfront structures or developments are to be approved, preservation should be assured for 50-100 years by employing a shoreline setback based on the rate established by the appropriate study.*

15. *Promote drainage and stormwater management practices that prevent flooding and protect coastal water quality.*

16. *Create a coastal improvement district emphasizing equal preservation of both coastal lands and beaches through the adoption of zoning and land use controls that encourage compatible development in safe areas, provide for the long-term economic needs of beach and dune nourishment and maintenance, and enable strategic retreat from the coast wherever feasible through a program of land acquisition, economic incentives and specific construction guidelines.*

Discussion: The Nguyen single-family residence will be sensitive to the site with measures taken to minimize environmental impacts. Because the residence will occupy less than two percent of

the total site, there will not be significant impacts to the open space or scenic characteristics of the site. The proposed house site is on a relatively level portion of the property that is setback from Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway. In addition, the high cliffs on the shoreline perimeter of the parcel, combined with the setback of the residence from the cliff edge, will limit sight of the residence from view plains at neighboring Mokulē'ia Beach and other adjacent coastline areas. Landscaping for the residence will incorporate much of the existing on-site vegetation and additional landscaping will be compatible with the existing environment.

Subsequent portions of this environmental assessment identify potential impacts and discuss appropriate mitigative measures to ensure that the Nguyen single-family residence will not have a significant impact on the environment.

CULTURAL RESOURCES

Goal

To preserve, protect and restore those cultural resources and sites that best represent and exemplify the Lahaina region's pre-contact, Hawaiian Monarchy, missionary and plantation history.

Objectives and Policies

1. *Preserve and protect significant archaeological, historical and cultural resources that are unique in the State of Hawaii and Island of Maui.*

3. *Encourage and protect traditional shoreline and mountain access, cultural practices and rural/agricultural lifestyles. Ensure adequate access to our public shoreline areas for public recreation, including lateral continuity.*

6. *Ensure that new projects or developments address potential impacts on archaeological, historical, and cultural resources and identify all cultural resources located within the project area as part of initial studies. Further require that all proposed activity adequately mitigate potential adverse impacts on cultural resources.*

10. *Ensure that site identification and interpretation is not damaging to any historical or archaeological sites.*

11. *Recognize the importance of buffer areas to enhance and protect historical or archaeological sites.*

Implementing Actions

3. *Identify specific historical or archaeological sites for protection and interpretation.*

Discussion: Archaeological resources that have been identified for preservation on the site will be preserved and protected through the creation and implementation of a preservation plan and

by the creation of buffer zones around specific sites. Shoreline areas will be open to the public and the existing shoreline access will not be restricted or changed.

An archaeological survey of the property was completed in January 2002 (see Appendix A). The State Historic Preservation Division accepted this archaeological survey in June 2002. Maui Land & Pineapple Company, Inc., and the future landowner will comply will all state and county laws and rules regarding the preservation of cultural and historic sites. See Section 5.1 for additional information on archaeological and historic resources. See Section 5.2 for additional information on cultural resources.

URBAN DESIGN

Goal

An attractive and functionally integrated urban environment that enhances neighborhood character, promotes quality design at the resort destinations of Kaanapali and Kapalua, defines a unified landscape planting and beautification theme along major public roads and highways, watercourses, and at major public facilities, and recognizes the historic importance and traditions of the region.

Objectives and Policies

9. *Save and incorporate healthy mature trees in the landscape planting plans of subdivisions, roads or any other construction or development.*

10. *Incorporate drought-tolerant plant species in future landscape planting.*

15. *Emphasize contrasting earth-tone color schemes for buildings and avoid bright or garish colors.*

Discussion: The design of the Nguyen residence will be sensitive to the site with measures taken to minimize environmental impacts. Design considerations will include selecting earth tone paints and surface colors for the structure and roof so as to blend with the surrounding area, and limiting grading and/or contouring of the property. Landscaping for the residence will incorporate much of the existing on-site vegetation and additional landscaping will be compatible with the existing environment.

3.2.3 Maui County Code

3.2.3.1 County of Maui Zoning

Kalaepīhā Point is within the State Conservation District and is designated "Conservation" on the *West Maui Community Plan*. The County of Maui does not have a zoning designation for lands within the State Conservation District, which are administered by the State Department of Land and Natural Resources.

3.2.3.2 Special Management Area

Kalaepīhā Point is within the Special Management Area (SMA) of the County of Maui (Figure 9). Development within the SMA requires a Special Management Area Use Permit. However,

under Section 205A-22, *Hawai'i Revised Statutes*, construction of a single-family residence is exempt from the SMA requirements.

3.3 APPROVALS AND PERMITS

An approximate list of permits and approvals required for the proposed Nguyen home is presented below.

Required Permits and Approvals

Permit/Approval	Responsible Agency
Chapter 343, HRS compliance	Department of Land and Natural Resources Office of Environmental Quality Control
Conservation District Use Board Permit	Department of Land and Natural Resources/Board of Land and Natural Resources
Special Management Area Exemption	County of Maui Planning Department
Compliance with Chapter 6E, HRS	State Historic Preservation Division
Conformance with Department of Health "Wastewater Systems" requirements (*Hawai'i Administrative Rules* Chapter 11-62)	Department of Health

4.0 DESCRIPTION OF THE AFFECTED NATURAL ENVIRONMENT, POTENTIAL IMPACTS OF THE PROPOSED ACTION, AND MITIGATIVE MEASURES

This chapter focuses on description of physical environmental conditions at Kalaepīhā Point. These conditions are considered in relation to the potential effects of the proposed single-family residence. It identifies potential significant impacts to the physical environment and describes mitigative measures.

4.1 CLIMATIC CONDITIONS

Climatic conditions at the Kalaepīhā Point property are strongly influenced by close proximity to the ocean and its tendency to influence temperature and affect wind flow. This area of West Maui exhibits relatively low day-to-day and month-to-month variability in temperature. August highs approach 88°F, and January lows are around 62°F.

Prevailing northeast tradewinds typically reach about 16 to 20 knots or approximately 18 miles to 23 miles per hour (Juvik and Juvik 1998), but occasionally attain speeds of up to 45 miles per hour. Kona or southerly winds typically occur only a few days annually, and mostly in association with localized winter storms. The West Maui Mountains help shelter the Kalaepīhā area from the strong trade winds that affect much of windward Maui. The average annual rainfall in the vicinity of the Kalaepīhā Point property is about 20 to 30 inches. Rainfall is relatively light and occurs primarily between the months of November and April.

Potential Impacts and Mitigative Measures

The Nguyen single-family residence is not anticipated to alter existing climatic conditions in the area or region, therefore no mitigative measures are proposed.

4.2 TOPOGRAPHY & GEOLOGY

The Kalaepīhā Point property is located on the *makai* side of Honoapi'ilani Highway in the Honolua area of West Maui. Elevations range from sea level to a maximum of 127 feet on the land above Kalaepīhā Point.

For the purpose of geologic characterization, Maui is divided into East and West Regions. East Maui is dominated by Haleakalā Volcano. Kalaepīhā Point is situated on the leeward side of West Maui. West Maui is a volcano, estimated to be more than two million years old. Its last eruptions occurred about 200,000 years ago.

There are five major geologic units on West Maui: (1) Pliocene and Pleistocene volcanic rocks, including the Wailuku and Honolua volcanic series; (2) Pleistocene and recent volcanic rocks, including the Lahaina volcanic series; (3) Pleistocene sediments which include calcareous dunes and consolidated earthy deposits; (4) recent sediments which include unconsolidated deposits; and (5) historic volcanic rocks (Juvik and Juvik 1998). Juvik and Juvik (ibid.) describe the geology of West Maui:

> An extinct volcano whose evolution includes shield, postshield and rejuvenated stages forms West Maui. Numerous cones, domes, dikes, flows, and pyroclastic deposits of mugearite, hawaiite, and trachyte represent the postshield stage, while the only evidence of its rejuvenated stage is a few vents and flows located mainly near Lahaina. Erosion has exposed nearly 4,900 vertical feet (1,490 meters) of volcanic layers on West Maui. (p. 43)

Typically, the West Maui basalt is comprised of thin-bedded ʻaʻā and pāhoehoe lavas created by eruptions along rift zones. The soils of West Maui, which reach depths of about 20 feet, indicate that the volcanic activity probably stopped in the Pliocene or earliest Pleistocene era. The following situation is described by MacDonald et al. (1983:376-378):

> Stream erosion of West Maui volcano has reached a late youthful to submature stage. Because of the thick armor of Honolua flows, the rainy northeastern slope has reached a less advanced stage of dissection than might otherwise be expected, and broad surfaces that have not been lowered much below the original surface lie between the deep canyons. In contrast, the drier southwestern slope has been much more deeply dissected, leaving sharp-crested ridges between the valleys.

Potential Impacts and Mitigative Measures

The Nguyen single-family residence will be situated on a relatively flat portion of the property approximately 150 feet from Honoapiʻilani Highway (see Figure 5). The driveway for the proposed property will follow existing contours and avoid any steep grades. Therefore, the project will require minimal grading and will not have a significant impact upon the existing topography.

4.3 SOILS

Most of the Kalaepīhā Point property is gently sloping rocky soil. The land drops off abruptly along the rocky outcroppings that characterize the *makai*-side cliff features.

Three soil suitability studies have been prepared for lands in Hawaiʻi. These are the U.S. Department of Agriculture (USDA) *Soil Conservation Service Soil Survey* (SCS), the University of Hawaiʻi Land Study Bureau *Detailed Land Classification*, and the State of Hawaiʻi Department of Agriculture's *Agricultural Lands of Importance to the State of Hawaiʻi* (ALISH). The principal focus of these studies has been to describe the physical attributes of Hawaiʻi's lands and the relative productivity of different land types for agricultural production purposes.

The USDA SCS, *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai*, classifies soils in the Kalaepīhā area into two distinct soil types: Alaeloa silty clays (AeC), and Rock Land (rRK). A brief description of these types follows:

> Alaeloa Silty Clays (AeC) - These well-drained soils are typically located in Maui's upland regions. Elevations range from 100 to 1,500 feet above sea level with slopes

ranging from three to 70 percent. Where slopes range from seven to 15 percent, runoff is slow to medium and the erosion hazard is slight to moderate. In areas not previously eroded, the subsoil is approximately 48 inches thick and moderately acidic in the surface layer, and strongly acid in the subsoil. These soils are typically appropriate for pineapple, grazing, wild life habitat, and homesites. They are also amenable for containing water resources.

Rock Land (rRK) - Rock land soils are defined by exposed rock, which covers 25 to 90 percent of the surface. Rocky outcroppings and very shallow soils are the primary characteristics of this type. The outcrops are mainly basaltic and andesitic. This soil/land type ranges from nearly level to very steep. Elevations range from nearly sea level to more than 6,000 feet. Rock land is often used for pasture, and is often wildlife habitat. Water is often contained below rock land.

The University of Hawai'i Land Study Bureau document titled *"Detailed Land Classification - Island of Maui"* classifies lands at and in the vicinity of Kalaepīhā as "E" (Figure 10). This classification is based on a five-class productivity rating using the letters A, B, C, D, and E, where A represents the highest class of productivity and E the lowest. The "E" rated soils cover the entire site. These soils generally have little or no potential for soil-based agricultural production.

The *Agricultural Lands of Importance to the State of Hawai'i* (ALISH) system classifies a portion of the soils on the property as "Prime Agricultural Land," and the remainder as "not classified" (Figure 11). ALISH defines Prime Agricultural Land as possessing the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops when treated and managed in accordance with modern farming methods. Unclassified lands are characterized as having no value for soil-based agriculture.

The discrepancy between the ALISH system (which classifies a portion of the soils as "Prime) and University of Hawai'i Land Study Bureau system (which classifies all of the soils as "E", the lowest soil rating) most likely is because the ALISH "Prime" rating is assumed if the land is irrigated or other modern farming methods are applied. Without these measures, the "Prime" rating probably would not be applicable. It is also possible that the differences are a result in the degree of resolution provided in the respective soil map depictions, wherein the University of Hawai'i Land Study Bureau mapping system provides greater resolution and a more specific indication of soil quality at the Kalaepīhā Point property.

Potential Impacts and Mitigative Measures

The Kalaepīhā Point property is not currently used for agricultural purposes. It is unlikely that the property would be used for agriculture in the future because of its relatively small size, rugged topography, and rocky soil characteristics.

With the minimal grading necessary for the residence and the additional landscaping to be provided, no significant impacts upon the soils of the site are expected. The residence will be situated on a relatively flat portion of the property approximately 150 feet from Honoapi'ilani Highway (Figure 5). The driveway for the proposed property will follow existing contours and

avoid any steep grades. Additional landscaping that will be provided as part of the site design will help to secure the soils of the site and prevent excessive water or wind erosion.

4.4 DRAINAGE

No physical infrastructure currently directs drainage flow on the Kalaepīhā Point property. Drainage across the parcel is non-directed and sheet flows across the site and is either absorbed into the ground or eventually flows to the ocean. See Section 5.93 and Appendix E for more information on drainage improvements to be implemented along with the construction of the Nguyen residence.

In 1990, Maui Land & Pineapple Company, Inc., instituted a water quality monitoring program to assess water chemistry characteristics of adjacent Honolua Bay on a periodic schedule. The intent of the program was to establish a quantitative baseline of water chemistry constituents that could reveal if water quality in Honolua Bay was being affected by factors associated with human activity on land. Specifically the study was instituted because of the development of the Plantation Estates subdivision and the Plantation Estates Golf Course, both of which are near Honolua Stream and are across Honoapi'ilani Highway from the Kalaepīhā Point property.

The monitoring program encompassed twelve phases of monitoring over a duration of seven years. The cumulative results of the surveys conclude that fertilizer nutrient input to Honolua Bay does not appear to have increased over the span of monitoring, and in fact appears to be decreasing. Further, the studies conclude that "nutrients entering the Bay from both natural and man induced activities do not appear to be causing any negative impacts to either water quality or biotic structure of Honolua Bay."

In May of 2001, the monitoring program was renewed and a new water quality study (Marine Research Consultants 2001) was conducted. During the four-year interval between studies there were no major changes in land use in the Honolua Watershed. The May 2001 study concludes, "water quality within Honolua Bay cannot be considered in violation of State standards."

Potential Impacts and Mitigative Measures

All drainage improvements will be in accordance with the provisions of the County's drainage ordinance and the State Department of Health's Clean Water Act. Runoff entering the ocean will be limited to pre-development conditions. See Section 5.93 and Appendix E for more information on drainage improvements to be implemented along with the construction of the Nguyen residence.

With baseline water quality data for Honolua Bay already established, and with on-going studies, any changes in water quality due to the Nguyen single-family residence will be monitored and if warranted, corrective action can be taken.

4.5 NATURAL HAZARDS

Natural hazards affecting the Hawaiian Islands include hurricanes, volcanic eruptions, earthquakes, and flooding. Volcanic hazards in the Kalaepīhā area are minimal insofar as recent

Legend

- Project Site

Soil Classifications

- A Excellent
- B Good
- C Fair
- D Poor
- E Very Poor
- Urban/Unclassified
- Streams
- Major Roads

Figure 10
Detailed Land Classification
NGUYEN RESIDENCE

NORTH

LINEAL SCALE (FEET)
1000 0 2000

PBR HAWAII
9/11/03

Source: Land Study Bureau
Q:\Maui\Kalaepiha\GIS\projects\1-14-03.apr

Legend

- Project Site

Agricultural Lands of Importance (ALISH)

- Prime
- Unique
- Other
- Unclassified Land
- Major Roads
- Streams

Figure 11
Agricultural Lands of Importance to the State of Hawaii (ALISH)
NGUYEN RESIDENCE

NORTH
LINEAL SCALE (FEET)
1000 0 2000

PBR HAWAII
9/11/03

Source: State of Hawaii Department of Agriculture
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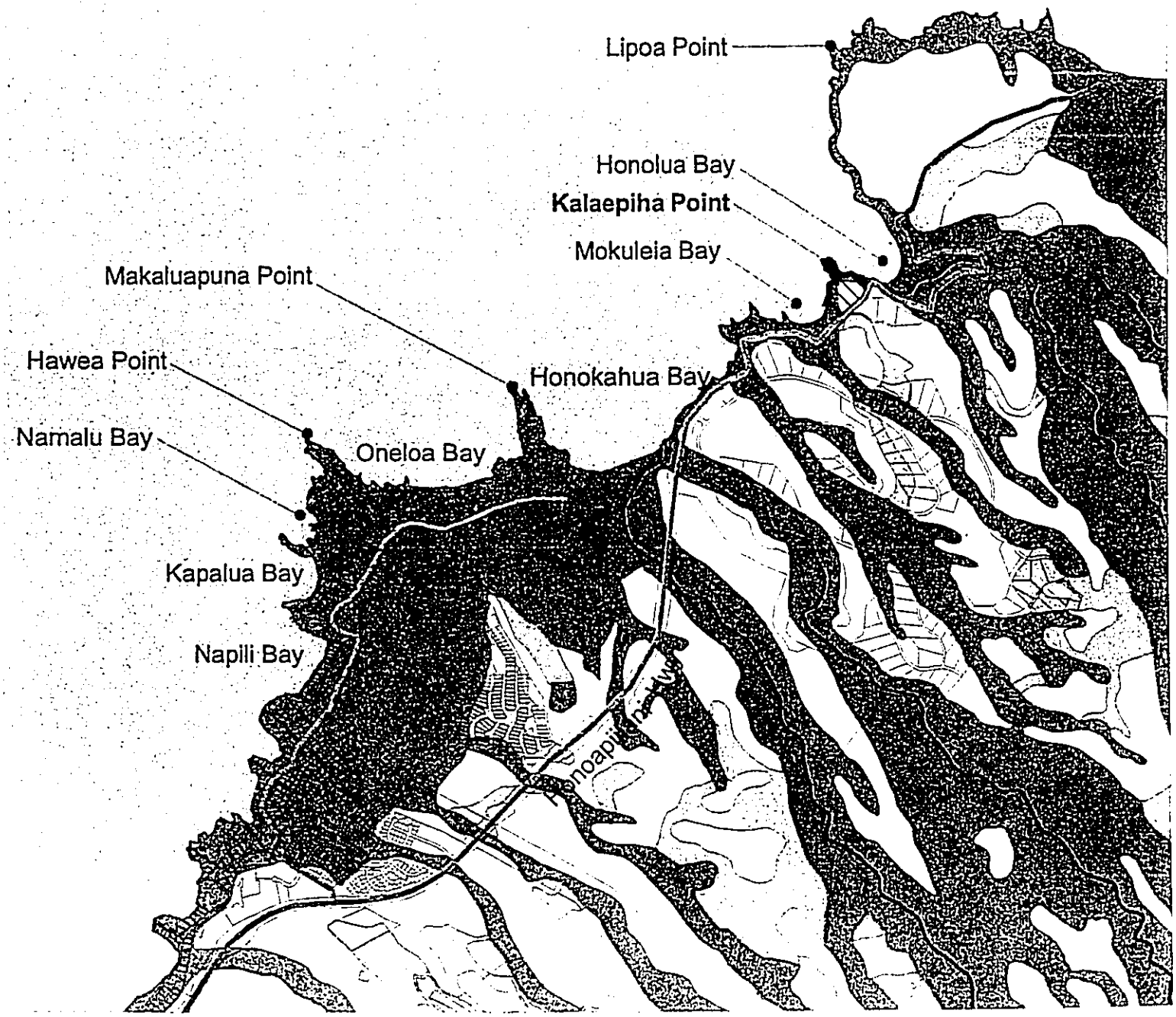


Legend

- Project Site

Agricultural Lands of Importance (ALISH)

- Prime
- Unique
- Other
- Unclassified Land
- Major Roads
- Streams

Figure 11
Agricultural Lands of Importance
to the State of Hawaii (ALISH)
NGUYEN RESIDENCE

NORTH
LINEAL SCALE (FEET)
1000 0 2000

PBR HAWAII
9/11/03

Source: State of Hawaii Department of Agriculture
Q:Maui\Kalaepiha\GIS\projects\1-14-03.apr

activity is an indication of danger. No lava flows have impacted the West Maui region for at least 20,000 years (MacDonald et al. 1983).

Most earthquake activity in Hawai'i is related to volcanic rather than tectonic activity. Thousands of small earthquakes occur in Hawai'i each year, and moderate and disastrous earthquakes have rocked the islands in the past. The epicenter of the 1938 Maui Earthquake was six miles north of Maui. The quake registered 6.7 to 6.9 on the Richter scale, generating landslides, ground fractures, and infrastructure damage across Maui.

Hurricanes have directly impacted Hawai'i twice in the past two decades. Both events were centered on Kaua'i. Hurricane 'Iwa struck in 1982 and Hurricane 'Iniki in 1992. While these events are relatively rare in Hawai'i, they do occur and call for advanced planning and state and county policy considerations.

Flood hazards areas in the vicinity of Kalaepīhā Point are depicted in the Flood Insurance Rate Map (FIRM) (Figure 12) prepared by the Federal Emergency Management Agency (FEMA), National Flood Insurance Program. According to the FIRM, the majority of the Kalaepīhā Point parcel is within "Zone C," an area of minimal threat of flooding. The immediate coastal zone area surrounding Kalaepīhā Point is subject to high surf and associated hazards.

Steep slopes are subject to landslide problems, especially where unstable soils predominate. However, most of the soils in the Kalaepīhā area are relatively stable and therefore landslide threats are minimal.

Potential Impacts and Mitigative Measures

The Nguyen single-family residence will not exacerbate any hazard conditions. The potential impacts on the residence from earthquakes and from destructive winds and torrential rainfall from hurricanes will be mitigated by compliance with Maui County building code.

4.6 FLORA

No threatened or endangered plant species have been observed in the Kalaepīhā region, including the Kalaepīhā Point property. A botanical survey conducted by Char (2001) (see Appendix B) enumerated 101 floral species within a 31-acre coastal area on both sides of the Kalaepīhā Point parcel. Of these species, 83 percent were introduced in recent centuries, four percent were introduced by Polynesians in prehistoric times, and 13 percent are native. Eleven of the native species are indigenous (that is, common to Hawai'i but also to other areas). The pā'ū o Hi'iaka vine and sedge species called *Cyperus phleoides* are endemic species (that is, found only in Hawai'i). Introduced species such as ironwood (*Casuarina equisetifolia*), koa haole (*Leucaena leucocephala*), Guinea grass (*Panicum maximum*), Christmas berry (*Shinus terebinthefolius*), and monkeypod trees (*Samanea saman*) dominate the local flora.

Coastal cliff vegetation in the Kalaepīhā Point area is characterized by stands of wind- and salt-pruned ironwood (*Casuarina equisetifolia*), and thickets of koa haole. Airplant (*Kalanchoe pinnata*), sourgrass (*Digitaria insularis*), and Guinea grass form the ground cover in these steep areas.

Patches of native plants were observed along the exposed rocky bluffs. These include 'ilima papa (*Sida fallax*), *Fimbristylis cymosa*, 'ōhelo kai (*Lycium sandwicense*), Cyperus phleoides, 'ākulikuli (*Sesuvium portulacastrum*), kīpūkai (*Heliotropium curassavicum*), pā'ū o Hi'iaka (*Jacquemontia ovalifolia* subspecies *sandwicensis*), 'ilie'e (*Plumbago zeylanica*), and 'ala 'ala wai nui (*Pepperomia blanda var. Floribunda*).

Ironwood forest is typical along the relatively flat *mauka* or highway portion of the study area. Many individuals reach up to 60 feet in height, shedding a floor of ironwood "needles." Open areas of the forest support koa haole shrubs, Christmas berry, sourbush (*Pluchea carolinensis*), night-blooming cereus (*Hylocerus undatus*), Natal redtop grass (*Melinus repens*), Chinese violet (*Asystasia gangetica*), and Mauritius hemp (*Fucreaea foetida*).

The immediate environs of the Kalaepīhā Point property are open and grassy. Vegetation here is dominated by dense clumps of Guinea grass, small stands of ironwood, and patches of koa haole. Mexican poppy (*Argemone mexicana*), *Neonotonia wightii*, a common fodder legume, and Natal redtop grass (*Melinis repens*) are also present. Various ornamental species were observed near the remnants of structures still visible on the property. These include wandering Jew (*Tradescantia zebrina*), Cussonia spp., ti (*Cordyline fruticosa*), fan palm (*Livistonia spp.*), and bamboo (*Bambusa spp.*). Two rows of Norfolk Pine (*Araucaria heterophylla*) are established near the highway portion of the Kalaepīhā Point parcel. Kiawe (*Prosopis pallida*) and Christmas berry also occur in this area.

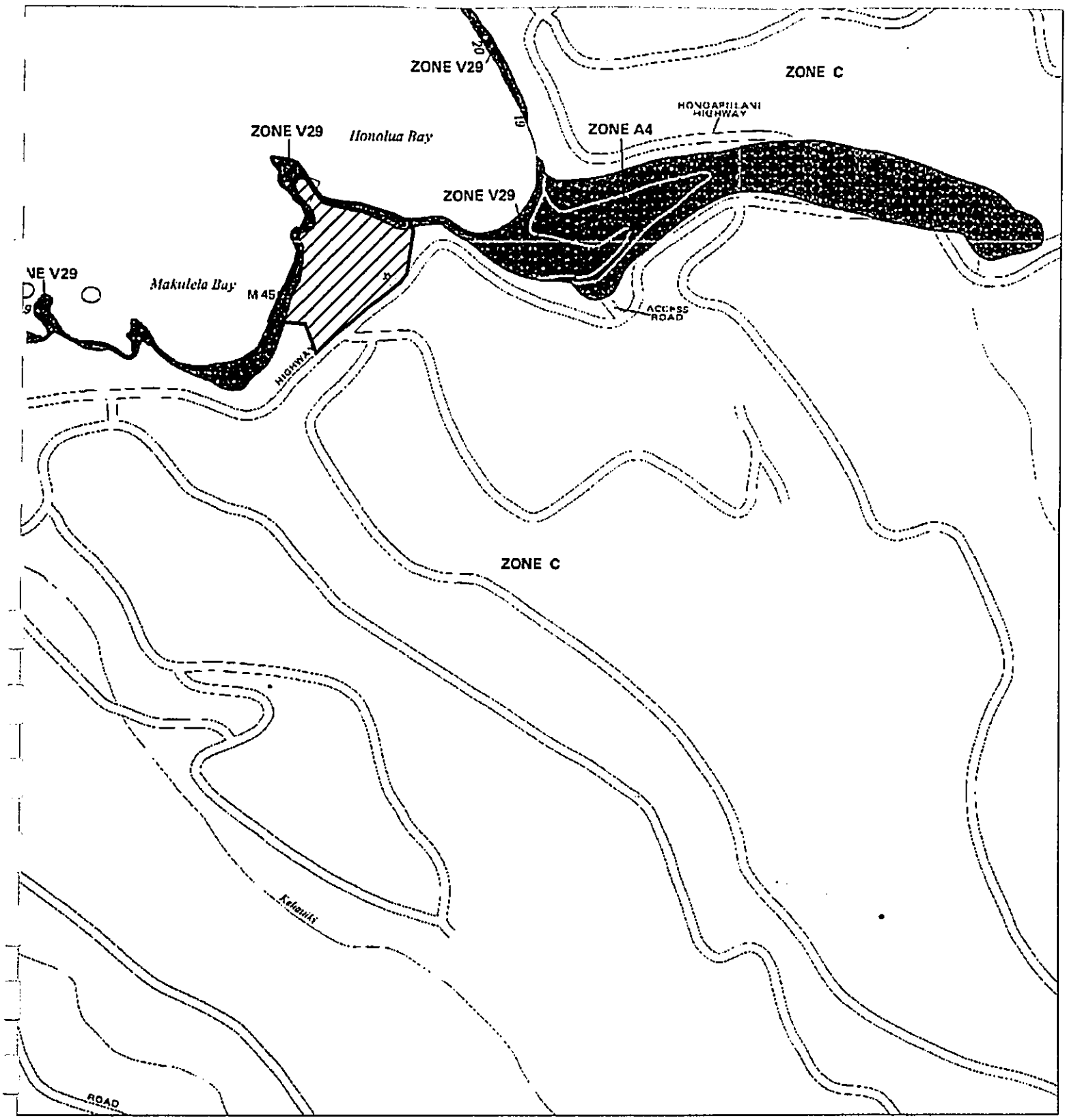
Potential Impacts and Mitigative Measures

No threatened or endangered plant species will be impacted by the Nguyen single-family residence. Landscaping for the residence will incorporate much of the existing on-site vegetation and additional landscaping will be compatible with the existing environment. The house site will be located on an existing large open grassy area near the central portion of the parcel. Minimal alterations to the existing vegetation will be required for construction of the residence. Figure 5 shows the conceptual landscape master plan for the property.

In their comment letter on the *Kalaepīhā Lands Draft Environmental Assessment* (PBR HAWAII 2002), the Department of Land and Natural Resources Division of Forestry & Wildlife Maui office stated that two of their staff members conducted a site visit of the Kalaepīhā area (which included the Kalaepīhā Point property) on June 27, 2002. The letter further stated: "Our assessment of the area indicated the absence of any endangered flora or fauna on the parcel. The vegetation and terrain are accurately described in the Draft Environmental Assessment."

4.7 FAUNA

No threatened, endangered, or native bird or mammal species were observed in the Kalaepīhā region (including on the Kalaepīhā Point parcel) during the course of a faunal survey conducted during March 2001 (Bruner 2001) (see Appendix C). During the survey accessible areas were surveyed on foot, and cliff faces were viewed from above. Observations were made during both early morning and late afternoon hours when birds and mammals are typically most active.



Legend

- Project Site
- Zone A — Areas of 100-year flood; base elecations and flood hazard factors determined
- Zone C — Areas of minimal flooding
- Zone V — Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined

Source: Federal Emergency Management Agency
Federal Insurance Administration
FIRM Map Number 150003 0139 B
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Figure 12
Flood Insurance Rate Map
NGUYEN RESIDENCE

NORTH

LINEAL SCALE (FEET)
200 0 400

PBR HAWAII

9/11/03

Bruner (2001) suggests that much of the area is too exposed to predators to support breeding populations of native seabirds, and that available habitats are not appropriate for native land-based avian species.

Three individuals of the migratory shorebird known as the Wandering tattler (*Heteroscelus inanus*) were observed foraging along the shoreline. This is a common winter visitor to the Hawaiian Islands. Bruner (2001) notes the likelihood that other migratory shorebirds also visit the area, though none were observed during the course of the survey. Probable visitors include the Pacific Golden Plover (*Pluvialis fulva*), the Sanderling (*Calidris alba*), and the Ruddy Turnstone (*Arenaria interpres*).

The House Finch (*Carpodacus mexicanus*), which is often seen in association with ironwood trees in Hawai'i, was the most abundant avian species observed during the survey. Other avian surveys conducted in this part of Maui have arrived at similar findings.

A total of 12 introduced bird species were observed during the survey. Each is common to lowland areas of Maui. These are as follows: Gray Francolin (*Francolinus pondicerianus*), Rock Dove (*Columba livia*), Spotted Dove (*Streptopelia chinensis*), Zebra Dove (*Geopelia striata*), Hwamei (*Garrulax canorus*), Northern Mockingbird (*Mimus polyglottus*), Common Myna (*Acridotheres tristis*), Japanese White-eye (*Zosterops japonicus*), Northern Cardinal (*Cardinalis cardinalis*), Red-crested Cardinal (*Paroaria coronata*), House Finch (*Carpodacus mexicanus*), and Nutmeg Mannikin (*Lonchura punctulata*).

Two mammal species were observed. These were the Small Indian Mongoose (*Herpestes auropunctatus*) and assorted feral cats (*Felis catus*). While none were seen during the survey period, Bruner (2001) suggests that the local environment likely supports rats (*Rattus spp.*) and mice (*Mus musculus*).

Potential Impacts and Mitigation Measures

No threatened, endangered, or native bird or mammal species will be impacted by the Nguyen single-family residence. The proposed residential structure will be set back from the coastal edge of the property and will not alter the shoreline, where migratory shorebirds were observed foraging.

In their comment letter on the *Kalaepīhā Lands Draft Environmental Assessment* the Department of Land and Natural Resources Division of Forestry & Wildlife Maui office stated that two of their staff members conducted a site visit of the Kalaepīhā Lands (which includes the Kalaepīhā Point parcel) on June 27, 2002. The letter further stated: "Our assessment of the area indicated the absence of any endangered flora or fauna on the parcel."

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5.0 ASSESSMENT OF EXISTING HUMAN ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

5.1 ARCHAEOLOGICAL AND HISTORIC RESOURCES

An archaeological survey of the Kalaepīhā region (including the Kalaepīhā Point property) was conducted in 2001. The subsequent archaeological survey report was completed in May 2002 and accepted by the State Historic Preservation Division in June 2002 (see Appendix A, Fredericksen and Fredericksen 2002).

Two probable pre-contact archaeological sites were identified on the Kalaepīhā Point parcel: 1) a paved enclosure with an associated access trail and probable fish-spotting station (site 5093); and 2) a remnant of a possible habitation area (site 5094). Two historic-era sites were also identified on the Kalaepīhā Point parcel: 1) remnants of an old government road (site 5095); and 2) remnants of the concrete foundation of an old slaughterhouse (site 5096).

According to Fredericksen and Fredericksen (ibid., p. 1), all sites in the Kalaepīhā Point area qualify for significance under Criterion "d" of federal and state historic preservation guidelines; that is, yielding important information for prehistoric or historic research. Given potential cultural significance to Hawaiians, the fish spotting station may qualify under Criterion "e" (having an important traditional cultural value to the native Hawaiian people or to another ethnic group). Finally, the old government road may qualify under Criteria "a" (being associated with events that have made an important contribution to the broad patterns of our history) given its importance to broad understanding of transportation patterns on Maui.

Potential Impacts and Mitigation Measures

All recommendations of the archaeological survey report in regard to preservation of archaeological sites will be followed. The report recommends in-place preservation for: 1) the paved enclosure with an associated access trail and probable fish-spotting station (site 5093); 2) the remnant of a possible habitation area (site 5094); and 3) the remnants of the old government road (site 5095). These sites are shown on the Site & Preliminary Landscape Plan (Figure 5): site 5093 is shown with a 50 foot buffer; site 5094 is shown with a 15 foot buffer; and site 5095 is labeled "Preservation Area." Regarding the concrete foundation of the old slaughterhouse (site 5096) the report concludes the site is no longer significant and no further work is recommended.

The State Historic Preservation Division reviewed the archaeological survey report and agreed with the significance assessments and recommendations and found the report acceptable. A copy of the acceptance letter is included in Appendix A.

Xamanek Researches has prepared a preservation plan for the sites recommended for preservation in the archaeological study. This plan is included in Appendix A following the archaeological survey report. Preparation of the plan included consultation with Native Hawaiians. The preservation plan discusses preservation measures, the long-term preservation of each site, and specifies buffer zones around specific sites, where appropriate.

The preservation plan has been submitted to the State Historic Preservation Division (SHPD) for their review and approval. Copies of the plan will also be provided to the Office of Hawaiian Affairs and Na Kūpuna O Maui.

With the implementation of the preservation plan and the recommendations of archaeological survey report, the Nguyen residence is not anticipated to have an adverse impact on archaeological or historic resources within the site.

Maui Land & Pineapple Company, Inc., and the future landowner will comply with all state and county laws and rules regarding the preservation of cultural and historic sites during all phases of planning and construction and once the residence is inhabited. All construction plans will include the following language as normally recommended by the State Historic Preservation Division:

> *Should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work shall cease immediately in the immediate vicinity of the find and the find shall be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division at 692-8015, which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary.*

5.2 HISTORIC LAND USE AND CULTURAL IMPACTS

The Kalaepīhā Point area is part of Kā'anapali Moku, one of the 12 districts of ancient Maui. The Kā'anapali District includes much of the land in the northwest portion of West Maui, including all of its northwest coastline, and much of its northeast exposure. The Lahaina District borders Kā'anapali on the south, and the Wailuku District lies adjacent to the southeast. Kalaepīhā is part of Honolua *ahupua'a*, with Honokahua *ahupua'a* situated to the south, and Honokōhau to the north.

The history of land use in West Maui is similar to that of much of Hawai'i. Prior to contact with Europeans, ancient Hawaiians living here applied much of their time and energy to fishing, gathering of shoreline seafoods, terraced farming, and various cultural practices, including warfare (see Sterling 1998). Each of these activities left some indication of the past on the landscape, and the Kalaepīhā area was no exception. The possible fish-spotting station still standing on the land above Kalaepīhā Point clearly indicates the dietary importance of marine resources for Native Hawaiians of old, and perhaps also of contemporary times (Fredericksen and Fredericksen 2002). Other important prehistoric structures in the area include a Heiau for

Kū'ula [2] along the beach in Honolua Bay, the Honolua Heiau in Honolua Gulch, and a reputed hōlua slide[3] site along the *mauka* side of what is now Honoapi'ilani Highway.

Honolua Bay has long been an important site for ocean activities and related feats. Manu (1884), for instance, tells of brave Kihapi'ilani who long ago paddled a long surfboard from Honolua to Wailua on the eastern shore of Moloka'i. "He did not board any canoe" reports Manu, but "rode a long surfboard from Honolua and the wild surging waves of the Pailolo Sea carried him with no difficulty, a deed by which the famous waves of that deep blue sea were turned into a plaything as well as a sport by the chief."

Nearby Lahaina was an important center of economic activity in West Maui during historic times and served as capital city of post-contact Hawai'i during the reign of Kamehamaha until Kamehameha II named Honolulu the capital in 1840. Lahaina's typically peaceful waters provided ideal anchorage for commercial whaling operations active in the Pacific during the period from about 1825 through 1860. This strengthened a cash economy and furthered dramatic social changes already endured by the Hawaiian people (Daws 1973). Lahaina was also the location of some of the earliest sugar enterprises in Hawai'i. A railroad transported cane to Pioneer Mill and Lahaina Sugar Company in Lahaina from points north, including fields in the Kā'anapali area.

The Great Mahele[4] and related events led to massive socioeconomic change throughout Hawai'i, including West Maui. Missionaries and entrepreneurs moved into northwest portions of the region, and land was used in new ways to suit various commercial enterprises and pursuits. Reverend Dwight Baldwin was one such historical figure. Baldwin arrived on Maui in 1831, and by the mid-1800s had been granted 2,675 acres of land in the northwest portion of the island. Baldwin's son Henry acquired other parcels in the area and eventually established Honolua Ranch in the early 1890's. The cattle operation quickly became the new focus of activity for turn-of-the-century West Maui under the management of Richard Searle. Remnant structures associated with the ranch are today still visible on the Kalaepīhā Point property.

Honolua Ranch was converted to a pineapple plantation in 1912, following an agricultural trend that began on O'ahu around the turn of the century. It was about this time that Searle built a new house overlooking Honolua called Maka'oi'oi, or "keen-eyed" -- indicative of the numerous open spaces and vantage points that characterize the Kalaepīhā and Līipoa promontories.

Searle's granddaughter, Lucy Farden, reports that inter-island steamers called at Honolua on a monthly basis after about 1912. The steamship operators would anchor in deep water, and then

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[2]According to Pukui and Elbert (1971:172), kū'ula is any stone god used to attract fish, whether tiny or enormous, carved or natural, named for the god of fishermen.

[3]Hōlua slides were the ancient site of a recreational activity unique to Hawai'i. Courses were constructed from grass or delineated on grassy slopes on which participants would ride a sled-like board (*papa hōlua*) through a course, probably at high speeds. The skill and danger involved may have meant the activity was a rather serious form of recreation.

[4]The Great land division. Refers to the process by which the traditional communal system of land tenure in Hawai'i was converted to a system of private ownership.

launch rowboats for on- and off-loading of people and goods at a long pier built in the innermost and calmest part of the Bay. Farden reports that the entire Honolua area was open and grassy rather than overgrown as it is today. The Searle 'ohana was an enterprising and busy group, reportedly tending to ranch, and later, plantation duties, milling coffee from nearby Honokahua, surround-netting akule, setting old-style fish basket traps, and gathering limu and 'opihi (Farden 1979, as noted in Clark 2002).

By the 1920's, pineapple had been planted across West Maui from Māhinahina *ahupua'a* to Kahakuloa *ahupua'a*. A pineapple cannery was built at nearby Honokahua in 1914. Honolua Ranch became Baldwin Packers, Ltd., in 1923, with small plantation communities developing at Honokahua and Nāpili to support the operation.

West Maui grew significantly during the first half of the 20th century when agricultural production was at its peak. Over 15,000 persons were resident in the region just prior to World War II. However, by 1970 the population base diminished to about 5,500 persons.

Maui Land & Pineapple Company, Inc., was formed in 1962 when Baldwin Packers merged with Maui Pineapple Company. Maui Land & Pineapple Company, Inc., then became the parent company of Kapalua Land Company, Ltd., which conceived of a master-planned resort featuring the Kapalua Bay Hotel along the shoreline of Honokahua *ahupua'a*. The hotel opened in 1978, beginning the transformation of historic ranch and pineapple lands into a modern destination resort complex.

The resident population of Lahaina District has rebounded in recent decades in relation with increasing development and tourism-related job opportunities. The 1980 U.S. Census counted over 10,000 residents, rising to 14,574 in 1990, and 16,137 in 1995. The 2000 census enumerated 17,969 persons resident in the District.

Potential Impacts and Mitigation Measures

The Nguyen single-family residence will not interfere with any cultural practices associated with the site or the region. In preparing the archaeological survey and preservation plan, Xamanek Researchers obtained oral history accounts of the area from Mr. William Waiohu of the Maui/Lanai Islands Burial Council and Mr. Aimoku Pali of Honokohau Valley. Erik Frederickson of Xamanek Researchers also visited specific sites on separate occasions with:

- Mr. Leslie Kuloloio of Na Kupuna O Hawaii;
- Mr. William Waiohu of the Maui/Lanai Islands Burial Council;
- Mr. Wesley Nohara, Manager of Honolua Plantation and employee of Maui Pineapple Company Inc. for 34 years.
- Mr. Alexander Ross, descendent of the Koa family and individuals buried in the gravesite discovered on a separate parcel.

Before they were contacted, these individuals were unaware of the existence of the archaeological features discovered during the archaeological survey (with the exception of the historic slaughterhouse foundation and the portion of the old government road). Regarding the specific Kaleapiha Point parcel, this property has been fenced and gated for many years.

Considering these factors, it is reasonable to conclude that individuals currently do not use the property for current cultural practices. However, Maui Land & Pineapple Company, Inc., grants requests for access to its lands. Any change in ownership will not change the right of anyone with a legitimate reason from accessing the archaeological or cultural resources on the property.

As recommended in the archaeological inventory survey report (see Section 5.1 and Appendix A), archaeological sites identified for preservation on the property will be preserved, including the probable fish-spotting station. A preservation plan has also being prepared. The preservation plan discusses preservation measures, the long-term preservation of each site, and specifies buffer zones around specific sites, where appropriate.

The existing shoreline access will not be restricted or changed with the addition of the Nguyen single-family residence. Shoreline areas will continue to be open to the public. Steep cliffs along the shoreline fronting the Kalaepīhā Point property limit shoreline access from the top of the property, however existing shoreline access from the properties adjacent to the Kalaepīhā Point parcel allow access to the coastline for any cultural practices dependent on shoreline and nearshore resources.

5.3 ROADWAYS AND TRAFFIC

The primary roadway in the Kalaepīhā Point region is Honoapi'ilani Highway. This is an arterial highway, which in the vicinity of the Kalaepīhā property, is oriented roughly north-south. Honolua Place, a dead-end road providing access to three lots of the Plantation Estates, intersects Honoapi'ilani Highway is across the highway from the Kalaepīhā Point parcel.

In general, traffic flows smoothly in the vicinity of the Kalaepīhā Point parcel.

Access to the Kalaepīhā Point property is via Honoapi'ilani Highway from a driveway that served the previous on-site structures.

Potential Impacts and Mitigation Measures

The Nguyen single-family residence is not expected to generate significant additional traffic in the region. Under the Conservation District Rules only one single-family residence is allowed on a parcel in the Conservation District. The residence is limited to a maximum of 5,000 square feet and may only contain one kitchen. Thus, only one family will live on the site. Accordingly, any additional traffic in the area as a result of the residence will be limited to that of a single family.

In the short term, construction activities may cause a slight increase in traffic along Honoapi'ilani Highway in the vicinity of the site.

5.4 NOISE

Ambient noise levels in the Kalaepīhā area are estimated to range from 54 to 67 decibels, with primary sources being traffic from Honoapi'ilani Highway, wind, ocean waves breaking on the shore, and occasional distant aircraft. High surf events may tend to generate noise levels at the high end or above the measured range.

Potential Impacts and Mitigation Measures

The Nguyen single-family residence is not expected to generate significant additional noise in the region. However, in the short-term, ambient noise conditions may be impacted by construction activities. Proper mitigating measures, such as limiting construction to daylight hours, will be employed to minimize the noise impacts during construction.

5.5 AIR QUALITY

Regional and local climate and various anthropogenic sources tend to affect air quality at any given location. Hawai'i's remote location in the Central Pacific distant from major sources of pollution means that air problems generally result from local sources. Air quality can be diminished to some extent when intensive agricultural operations release fugitive soil dust, but these are relatively rare events. Other kinds of air pollution are limited in the West Maui region and are generally diffused by trade winds. Air quality in the Kalaepīhā area therefore tends to be very good and is expected to be well within both State and Federal Air Quality Standards.

Potential Impacts and Mitigation Measures

The Nguyen single-family residence is not expected impact air quality in the region. Potential short-term impacts on air quality due to construction activity may include fugitive dust and exhaust emissions from construction equipment. Site work such as grubbing and construction of the residence may generate some airborne particulates. Dust control measures, such as regular watering and sprinkling will be implemented as needed to minimize potential wind-blown emissions. Exhaust emissions from construction are not likely to exceed established air quality standards.

5.6 VISUAL RESOURCES

The Kalaepīhā Point property is visible from the distant points along Honoapi'ilani Highway to the south and the north; however bluffs and vegetation within the property obscure views of the ocean from the highway in front of the property. See Figure 4 for photographs of the property and views of the property.

Potential Impacts and Mitigation Measures

Primary scenic views of the region will not be significantly affected by the Nguyen residence. For example, the primary view of Honolua Bay upon driving north along Honoapi'ilani Highway will not be obscured by the residence. Likewise, driving south, the residence will be screened from the highway as bluffs and the current vegetation within the property obscure views of the ocean from the highway in front of the property. Additionally, the proposed house site is on a relatively level portion of the property that is setback from Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway. For a visual analysis of the building on the site see Figure 6c.

Because the residence will occupy less than two percent of the total site, there will not be significant impacts to the open space characteristics of the site. In addition, the high cliffs on the shoreline perimeter of the parcel, combined with the setback of the residence from the cliff edge, will limit the sight of the residence from view plains at neighboring Mokulē'ia Beach and other adjacent coastline areas.

The design and construction of the residence will be sensitive to the site. Separating the bedrooms from the living room and other residential uses into four small-scale buildings reduces the visual density of the residence and allows for landscaping between the structures. The existing topography and landscaping, as well as new landscaping, will be used to screen all structures from Honoapi'ilani Highway; earth tone paint/surface colors will be used for the buildings and roof so as to blend with the surrounding area.

5.7 SOCIAL AND DEMOGRAPHIC CHARACTERISTICS

The Kalaepīhā Point property is currently devoid of active use, with the exception of recreational access to the shoreline from adjacent parcels. The surrounding area includes large home sites of the Plantation Estates directly across Honoapi'ilani Highway and a shoreline single-family residence (Brennan Residence) to the south of the Kalaepīhā Point property. Kapalua Resort's Plantation Golf Course is also nearby. With these uses, the immediate area—while rural—is also residential in nature.

Job opportunities in the vicinity of Kalaepīhā are primarily associated with agriculture, area resorts, or private or public sector work in the Lahaina area. Most employment in the West Maui region is associated either with tourism or agriculture.

West Maui is among the most desirable resort/residential areas in Hawai'i. While areas adjacent to Kaanapali Beach and Lahaina have become more urbanized in character, the Kapalua Resort area maintains a low-density rural character. The area has a reputation for good weather and recreational opportunities.

The population of Maui County grew by about 28 percent between the 1990 and 2000 census periods. According to the 2000 U.S. Census figures, the population of Maui County was just over 128,000 persons, up from just over 100,000 in 1990. This continues a pattern of steady and significant long-term growth. Maui County was home to just 46,156 persons in 1960.

The population of West Maui (defined here as Lahaina, Kā'anapali, Nāpili-Honokowai, and Kapalua) was 17,748 persons, according to the 2000 Census. In addition to the resident population, approximately 38,000 non-residents visit Maui County on any given day, with some 15,000 of these populating West Maui.

While it remains relatively unpopulated and rural, the Kapalua CDP (Census Designated Place) also grew significantly since 1990. This area includes the Kalaepīhā Point area. The 1990 population of the Kapalua CDP was 394 persons in 1990, and 467 persons in 2000, an increase of 19 percent. Nearby Napili-Honokowai CDP was home to some 4,357 persons in 1990 and some 6,788 persons in 2000.

Potential Impacts and Mitigative Measures

As a residence for one family, the Nguyen home is not expected to have a significant impact on the social demographic characteristics of the surrounding area.

5.8 ECONOMIC CHARACTERISTICS

The Kalaepīhā Point property is currently vacant and generates no direct revenue for current landowner Maui Land & Pineapple Company, Inc.

The larger West Maui Region is a significant center for tourism and related recreational amenities. Nearly one-quarter of all Maui jobs and upwards of $3 billion in economic activity are generated in West Maui each year. West Maui accounts for almost 30 percent of the island tax base and more than 20 percent of countywide assessed real property value.

Potential Impacts and Mitigation Strategies

Relative to the vacant state of the property, the construction of a single-family residence on the Kalaepīhā Point parcel will provide a long-term economic benefit for the County of Maui in terms of increased property tax revenue based on the value of the residence. Maui Land & Pineapple Company, Inc., will also gain an economic benefit for from the sale of the land.

On a short-term basis, the construction of the Nguyen single-family residence will provide employment in construction and related industries.

5.9 INFRASTRUCTURE

5.9.1 Water System

The privately owned and operated Kapalua Water Company provides potable water to the Plantation Estates area from two deep wells located between elevation 750 and 800 feet northeast of Honokahua Gulch. Water from these wells is stored in a 100,000-gallon tank at elevation 815 feet and in a 1.0 million gallon tank at elevation 400 feet. Water is conveyed to the three Plantation Estate lots on Honolua Place (across Honoapi'ilani Highway from the Kalaepīhā Point parcel) by a series of 12-, 8-, and 4-inch lines and pressure regulator valves.

Kapalua Water Company also provides non-potable water to the Plantation Estates area from Honolua Ditch. Water from this ditch is conveyed and stored in a 7.8 million gallon open irrigation reservoir at elevation 740 feet. From this reservoir, non-potable water is conveyed to the three Plantation Estate lots on Honolua Place (across Honoapi'ilani Highway from the Kalaepīhā Point parcel) by means of a 12- and 8-inch distribution system, including a head breaker tank at elevation 500 feet.

Potential Impacts and Mitigation Strategies

The water system for the Nguyen residence will be extended across Honoapi'ilani Highway from the potable and non-potable lines on Honolua Place. A new fire hydrant on site will be connected to the non-potable system in keeping with the criteria established for Plantation

Estates. Easements for the water lines to cross Honoapi'ilani Highway will be obtained from the State Department of Transportation.

5.9.2 Wastewater Facilities

There are no sewer facilities within Kalaepīhā Point area. Lots in the northeast portion of Kapalua Resort, including the Plantation Estates located to the south of the Kalaepīhā Point parcel, use individual wastewater treatment facilities in the form of septic tanks with seepage pits or leach fields for wastewater disposal.

Potential Impacts and Mitigation Strategies

Because there are no sewer facilities within Kalaepīhā Point area, the Nguyen single-family residence will require a septic system for wastewater disposal. An application for an Individual Wastewater System (septic system) was submitted to the State Department of Health on October 13, 2003 for review and approval. The system will consist of one 1,250-gallon concrete tank and will use Standard Infiltrators for the leaching field. The system will be constructed in accordance with the provisions of the DOH Administrative Rules, Chapter 11-62, "Wastewater Systems". Appendix D includes the completed DOH application including plans for the Individual Wastewater System.

5.9.3 Drainage Facilities

No physical infrastructure currently directs drainage flow on the Kalaepīhā Point parcel. Drainage across the parcel is non-directed and sheet flows across the site and is either absorbed into the ground or eventually flows to the ocean. According to a drainage report prepared by Warren S. Unemori Engineering, Inc., (see Appendix E) the current onsite surface runoff generated from the Kalaepīhā Point parcel is estimated at 5.4 cubic feet per second (cfs) during a 50-year recurrence interval one-hour duration storm.

Potential Impacts and Mitigation Strategies

According to the drainage report, the post-development onsite surface runoff generated on the property with the addition of the Nguyen Residence is expected to be approximately 5.8 cfs for a 50-year recurrence interval 1-hour duration storm. Therefore, the net increase in runoff is expected to be approximately 0.4 cfs. This increase in onsite runoff will be directed into a new underground stormwater retention drain system that will be installed as part of the Nguyen Residence so that there will be no net increase of onsite surface runoff onto downstream properties or into the ocean.

The stormwater retention system will consist of approximately 25 lineal feet of 72 inch diameter perforated corrugated aluminum pipe. This system will be designed to accommodate the additional onsite post-development flow generated from the residence in accordance with the "Rules for the Design of Storm Drainage Facilities in the County of Maui".

All drainage improvements will be in accordance with the provisions of the County's drainage ordinance and the State Department of Health's Clean Water Act. Runoff entering the ocean will be limited to pre-development conditions.

For information about the impacts of drainage on Honolua Bay and Maui Land & Pineapple Company, Inc.'s ongoing Honolua Bay water monitoring program see Section 4.4.

5.9.4 Solid Waste Disposal Facilities

Generally, the County of Maui collects residential solid waste from accessible residential areas. Residential solid waste collected by County crews is disposed of at the County's 55-acre Central Maui Landfill, located four miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill accepts commercial waste from private collection companies.

Potential Impacts and Mitigation Strategies

Because of its location it is expected that a private solid waste collection service will collect waste from this site. Therefore Nguyen single-family residence is not expected to increase the demand for public waste disposal services in the area.

Green waste from cleared and grubbed material during construction will be disposed of in one of the Kapalua Report's green waste recycling and composting areas that are currently used as part of the Resort's golf course operations.

Construction waste such as drywall may be recycled if a local recycling vendor is available. During construction, whenever practical, solid wastes will be minimized and recycled. It will be recommended to contractors that a job-site recycling plan should be developed and, as much as possible, construction wastes should be recycled. Construction wastes that cannot be recycled will be disposed in the County's construction and demolition landfill near Maalaea.

5.9.5 Electrical and Communication Utilities

The main electrical, telephone, and cable television (CATV) overhead transmission lines in the Kalaepīhā area are located on the *mauka* side of Honoapi'ilani Highway.

Potential Impacts and Mitigation Strategies

Ducts for underground electrical, telephone, and CATV distribution systems will be extended across Honoapi'ilani Highway to the Kalaepīhā Point parcel from Honolua Place. Easements for electrical and telephone/CATV ducts be obtained from the State Department of Transportation to cross Honoapi'ilani Highway. The proposed Nguyen single-family residence is not expected to significantly increase the demand for electrical and communication services in the area.

5.10 PUBLIC SERVICES

Public schools in the West Maui region include the following:

- Kamehameha III Elementary (grades K-5)
- Nahienaena Elementary (grades K-5)
- Lahaina Intermediate (grades 6-8)

- Lahainaluna High School (grades 9-12)

Health care services for the West Maui region are primarily provided by the Comprehensive Health Center, located at the Lahaina Civic Center. Maui Memorial Medical Center, located in Wailuku, is the only major medical facility on the island. Acute, general and emergency care services are provided by the 194-bed facility. Plans are currently underway for the West Maui 24-Hour Acute Care Emergency Medical Facility, to be located on a 15-acre site near the Lahaina Civic Center.

Fire protection services are provided by the Nāpili Fire Station and the Lahaina Fire Station based at the Lahaina Civic and Recreation Center. The Nāpili Fire Station is located near the intersection of Honoapi'ilani Highway and Nāpilihau Street. This is approximately one and one-half miles from the Kalaepīhā Lands area. Presently, there is a staff of 15 firefighters operating three shifts of 5 firefighters on each shift, and one pumper truck. Backup from the Lahaina Station is approximately 10 minutes. The Lahaina fire station has one 1,250-gallon pumper truck with a crew of nine fire fighters per 24-hour shift. In addition, there is one ladder truck with a 75-foot aerial ladder, and 1,500 gpm capacity.

Police protection services are provided by the Lahaina Police Department, which is based at the Lahaina Civic Center approximately 7 miles from Kalaepīhā Point. Response time to the area is approximately 10 minutes.

The West Maui region also has numerous land-based and coastal related recreational areas, including the following parks:

- Hanaka'ō'ō Beach Park
- Wahikuli Beach Park
- Wahikuli State Wayside Park
- Māla Beach Park
- Kelawea Park
- Paunau Park
- Malu'ulu O Lele Park
- Nāpili Park

The new Maui Holo Ka'a Public Transit System runs a bus route in the West Maui region from Kapalua to Lahaina, although the route does not pass directly in the vicinity of Kalaepīhā Point.

Potential Impacts and Mitigation Strategies

The Nguyen single-family residence is not expected to significantly increase the demand for public services in the area.

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6.0 ALTERNATIVES TO THE PROPOSED ACTION

According to Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, Section 11-200-10(6), an environmental assessment must discuss potential alternatives to the proposed action.

The Nguyen single-family residence project involves the construction of one single-family residence within the parcel identified by TMK 4-2-04: 32 (portion.). As described in Section 2.1.1, the Kalaepīhā Point property was created by the subdivision of an approximately 20-acre parcel into three separate lots. The intent of the subdivision was to preserve the majority of the approximately 20-acre property in open space and recreational uses while allocating the potential for a single-family residence to the subdivided 6.5-acre Kalaepīhā Point property. As part of the subdivision requirements, restrictions to prohibit residential uses were placed on the other two parcels (the Coastal Reserve and the Honolua parcels) created by the subdivision.

Three alternatives to the proposed Nguyen single-family residence were considered. These are: 1) a no action alternative; 2) alternative siting; and 3) alternative styles, sizes, or configurations. These alternatives are discussed below.

6.1 THE NO ACTION ALTERNATIVE

Under the "no action" alternative a single-family residence would not be built on the Kalaepīhā Point property and the parcel would remain in its current vacant state with no changes.

This is not the preferred course of action as Maui Land & Pineapple Company, Inc., undertook the subdivision of the Kalaepīhā Lands property with the intent of preserving the majority of the area in open space and recreational uses while allocating the potential for a single family residence to the subdivided Kalaepīhā Point parcel.

Restrictions have been placed on the other two parcels created by the subdivision to prohibit residences. If the Kalaepīhā Lands subdivision had not taken place, the entire 20-acre Kalaepīhā Lands property could have been sold and the potential would have existed for a single-family house to be built anywhere on the site. In addition, under new ownership, continued open space, recreational uses, and public access would be uncertain.

With the subdivision, the Coastal Reserve and the Honolua parcels will be preserved for open space, recreational uses, and public access. Since the steep cliffs of the Kalaepīhā Point property prohibit shoreline access from the top of the property, in terms of public recreational uses and public access, a single-family residence on this parcel is reasonable.

6.2 ALTERNATIVE SITING

As discussed above, the entire 20-acre Kalaepīhā Lands property could have been sold without subdividing. Without the subdivision, the potential existed for a single-family house to be built anywhere on the site. Given the open space, public recreation, and shoreline access benefits of the Coastal Reserve and the Honolua parcels, a residence on these lands would not be as desirable as on the Kalaepīhā Point parcel.

Within the Kalaepīhā Point property, alternative locations for the residence are not practical. The existing location was chosen after a careful analysis based on the: 1) the topography; 2) significant archaeological sites; 3) shoreline setback requirements 4) available buildable area; and 5) location of the existing access road. Alternative sites on the property: 1) would be more visible from Honoapi'ilani Highway; 2) could interfere with the site's archaeological resources; or 3) could require significant grading or filling.

6.3 ALTERNATIVE STYLES, SIZES, OR CONFIGURATIONS

The proposed Nguyen single-family residence is a pleasing concept that reflects a "Hawaiian Style" architectural design. The size of the home (including any decks, garages, swimming pools, or other structures) is limited to 5,000 square feet by the State Conservation District Administrative Rules (Title 13, Department of Land and Natural Resources, Subtitle 1 Administration, Chapter 5, Conservation). Considering the size and value of the property, a 5,000 square foot residence is not unreasonable. The proposed configuration and massing has been chosen to minimize views of the residence from the roadway and the ocean. For these reasons, alternative styles, sizes, and configurations are not as preferable as the proposed style, size, and configuration.

7.0 DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

To determine whether the Nguyen single-family residence may have a significant impact on the physical and human environment, all phases and expected consequences of the proposed action has been evaluated. Potential primary, secondary, short-range, long-range, and cumulative impacts have been evaluated. Based on this evaluation, the Accepting Authority (the State of Hawai'i Department of Land and Natural Resources) has issued a Finding of No Significant Impact (FONSI) for the Nguyen Single-Family Residence. The supporting rationale for this finding is summarized in this chapter.

7.1 SIGNIFICANCE CRITERIA

According to the Department of Health Rules (11-200-12), an applicant or agency must determine whether an action may have a significant impact on the environment. This determination must consider all phases of the project, expected consequences both primary and secondary, cumulative impacts examined in conjunction with other projects, and its short and long-term impacts. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant physical and/or human environmental impacts will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of specific criteria. The determination of impacts potentially resulting from the construction of a single-family residence on the Kalaepīhā Point parcel, and the associated rationale supporting that determination are organized based on these criteria, as follows.

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;

The Nguyen single-family residence will not involve an irrevocable commitment or loss or destruction of natural or cultural resources. The proposed residential structure will be limited to a maximum of 5,000 square feet (including any decks, garages, swimming pools, or other structures), thereby maintaining the majority of the 6.5-acre site in open space. The design and construction will be sensitive to the site with measures taken to minimize environmental impacts. The small area of the residence will minimize the need for extensive grading or contouring of the site. Mitigative measures will be implemented to ensure that no impacts to the surrounding marine resources occur due to alterations in storm run-off conditions.

Archaeological resources that have been identified for preservation on the site will be preserved and protected through the implementation of a preservation plan and by the creation of buffer zones around specific sites. An archaeological survey of the property was completed in January 2002 (see Appendix A). The State Historic Preservation Division accepted this archaeological survey in June 2002. Maui Land & Pineapple Company, Inc., and the future landowner will comply with all state and county laws and rules regarding the preservation of cultural and historic sites.

The existing shoreline access will not be restricted or changed with the addition of the Nguyen single-family residence. Shoreline areas will continue to be open to the public. Steep cliffs along the shoreline fronting the Kalaepīhā Point property limit shoreline access from the top of the property, however existing shoreline access from the properties adjacent to the Kalaepīhā Point property allow access to the coastline for any cultural practices dependent on shoreline and nearshore resources.

(2) Curtails the range of beneficial uses of the environment;

The Nguyen single-family residence will not curtail the range of beneficial uses of the environment. The residence will occupy less than two percent of the total site. Relative to the existing un-managed state of the site, a residence will allow for the owner to maintain careful monitoring of site conditions, in effect providing stewardship of the site. In addition: 1) the archaeological resources that have been identified for preservation on the site will be preserved and protected; 2) the existing shoreline access will not be restricted or changed; and 3) measures will be implemented to ensure that no impacts to the surrounding marine resources occur due to alterations in storm run-off conditions.

(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 proposed Nguyen single-family residence is consistent with the environmental policies established in Chapter 344, HRS and the National Environmental Policy Act.

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

The Nguyen single-family residence is not expected to significantly affect the social or economic welfare of local, regional, or State communities. Under the Conservation District Rules only one single-family residence is allowed on a parcel in the Conservation District. The residence is limited to a maximum of 5,000 square feet and may only contain one kitchen. Thus, only one family will live on the site. Accordingly, any economic or social effects as a result of the residence will be limited to that of a single family.

(5) Substantially affects public health;

The Nguyen single-family residence is not expected to incur substantial changes in public health. In conformance with the standards for a single-family residence established by the Conservation District Rules, Department of Health wastewater permits and water system approvals will be obtained prior to construction of the proposed residence. Potential impacts to public health have been identified in previous sections of this environmental assessment and appropriate mitigative measures will be implemented and followed throughout all phases of construction.

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

The Nguyen single-family residence will not incur substantial secondary impacts, such as population growth or impacts on public facilities such as roads, water, sewer, or drainage systems. Given that only one single family residence is allowed on the property, any secondary effects as a result of the residence will be limited to that of a single family.

(7) Involves a substantial degradation of environmental quality;

The proposed Nguyen single-family residence will not involve degradation of environmental quality in either the immediate or surrounding areas. Potential impacts to the environment have been identified in previous sections of this environmental assessment and appropriate mitigative measures will be implemented and followed throughout all phases of development.

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

The Nguyen single-family residence will not incur cumulative impacts or involve a commitment for larger actions. Under the Conservation District rules only one single-family residence may be built on the property. The residence is limited to a maximum of 5,000 square feet (including any decks, garages, swimming pools, or other structures). Thus the majority of the 6.5-acre site will remain in open space, minimizing and limiting cumulative environmental impacts. In addition because only one family will reside on property, cumulative social impacts will be limited to that of a single family.

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

The Nguyen residence will not affect rare, threatened, or endangered species, or their habitats. Botanical and faunal surveys of the property confirm that there are no rare, threatened, or endangered plant or animal species on the Kalaepīhā Point property.

(10) Detrimentally affects air or water quality or ambient noise levels;

The Nguyen single-family residence will not involve long-term impacts to air or water quality or ambient noise levels. However short-term impacts may be expected during the construction of the single-family residence. Appropriate mitigative measures will be implemented during all phases of construction to minimize these impacts.

(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, freshwater, or coastal waters.

While located on a shoreline property, the site of the Nguyen residence is not anticipated to affect an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters. The property is bounded by steep shoreline cliffs on all *makai* edges. Below the cliffs the rocky shoreline area is subject to crashing waves, however, the house site is approximately 90 feet above Mean Sea Level (MSL) and is setback more than 100 feet from the certified shoreline. Stormwater runoff

will be limited to pre-development conditions. The soils of the property are stable and the threat of a landslide is minimal.

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

The Nguyen residence will not substantially affect vistas and view planes identified in county or state plans or studies. Primary scenic views of the region will not be significantly affected by the Nguyen residence. For example, the primary view of Honolua Bay upon driving north along Honoapi'ilani Highway will not be obscured by the residence. Likewise, driving south, the residence will be screened from the highway as bluffs and the current vegetation within the property obscure views of the ocean from the highway in front of the property. Additionally, the proposed house site is on a relatively level portion of the property that is setback from Honoapi'ilani Highway. The setback along with existing vegetation and bluffs on the north and south ends of the property will screen views of the residence from the highway.

Because the residence will occupy less than two percent of the total site, there will not be significant impacts to the open space characteristics of the site. In addition, the high cliffs on the shoreline perimeter of the parcel, combined with the setback of the residence from the cliff edge, will limit the sight of the residence from view plains at neighboring Mokulē'ia Beach and other adjacent coastline areas.

(13) Requires substantial energy consumption.

The Nguyen residence will not incur substantial energy consumption relative to other similar residences. Design of the residence will incorporate energy saving design measures. One completed the residence is expected to consume energy similar to other residences.

7.2 DETERMINATION

On the basis of impacts and mitigative measures examined in this document and analyzed under the above criteria, it is anticipated that the proposed Nguyen single-family residence will not have a significant effect on the local, County, or Statewide physical or human environments. Pursuant to Chapter 343, *Hawai'i Revised Statutes*, the Accepting Authority, which in this case is the State of Hawai'i Department of Land and Natural Resources, has issued a Finding of No Significant Impact (FONSI).

8.0 REFERENCES

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Warren S. Unemori Engineering, Inc. (2003) "Drainage Report, Kalaepīhā Point." Wailuku, Maui, Hawai'i."

9.0 COMMENTS ON THE DRAFT ENVIORNMENTAL ASSESSMENT & RESPONSES

The Draft Environmental Assessment and Conservation District Use Application were sent to the following agencies, organizations, and individuals. Where indicated the agency, organization, or individual submitted comments.

	AGENCY	DEA/CDUA Mail Date	Date of Comments
	STATE		
1	Department of Health	10/22/03	
2	Department of Land and Natural Resources - Forestry & Wildlife (Na Ala Hele)	10/22/03	
3	Department of Land and Natural Resources - Historic Preservation Division	10/22/03	11/14/03
4	Department of Land and Natural Resources - Maui District Land Agent	10/22/03	11/3/03
5	Department of Land and Natural Resources – Maui Board Member	10/22/03	
6	Lahaina Public Library	10/22/03	
7	Office of Environmental Quality Control	10/22/03	10/23/03
8	Office of Hawaiian Affairs	10/22/03	
	COUNTY OF MAUI		
9	Planning Department	10/22/03	
10	Department of Water Supply	10/22/03	
11	Department of Public Works and Environmental Management	10/22/03	11/18/03
	COMMUNITY ORGANIZATIONS		
	Life of the Land		11/11/03

The following pages contain comment letters received and responses.

1

LINDA LINGLE
GOVERNOR OF HAWAII

RECEIVED
LAND DIVISION

2003 NOV 18 P 2:20

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

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

PETER T. YOUNG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

DAN DAVIDSON
DEPUTY DIRECTOR - LAND

ERNEST Y.W. LAU
DEPUTY DIRECTOR - WATER

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

November 14, 2003

LOG NO: 2003.2325
DOC NO: 0311CD25

MEMORANDUM

TO: Dierdre S. Mamiya, Acting Administrator
Office of Conservation and Coastal Lands

FROM: P. Holly McEldowney, Acting Administrator
State Historic Preservation Division

SUBJECT: **Chapter 6E-42 Historic Preservation Review –Conservation District Use Application and Draft Environmental Assessment for the Proposed Nguyen Single Family Residence (File No.: MA-3163)**
[State/DLNR Office of Conservation and Coastal Lands]
Honolua Ahupua`a, Lahaina District, Island of Maui
TMK: (2) 4-2-004:032 por.

Thank you for the opportunity to review and comment on the Conservation District Use Application (CDUA) and Draft Environmental Assessment (Draft EA) for the Proposed Nguyen Single Family Residence, which was received by our staff October 24, 2003.

Based on the submitted CDUA and Draft EA, , we understand the proposed undertaking consists of the construction of a single family residence and the associated infrastructure installation, landscaping, etc. located within the State Conservation District. We have previously provided comments for the Preliminary Plat Review for the proposed Kalaepiha Subdivision. As these comments still apply they are paraphrased below.

In 2001, Xamanek Researches conducted an archaeological inventory survey which included the subject property. During the survey eight historic sites were identified. These sites include, a paved platform/enclosure with an associated access trail and fish spotting station (50-50-01-5093); a possible habitation site remnant (-5094); Old Government Road remnant (-5095); a remnant of the old slaughterhouse (-5096); two rock shelters (-5097), an *in situ* Native Hawaiian burial (-5098), a plantation-era refuse dump (-5006) and an enclosure (-5007). We accepted the report documenting the findings of the inventory survey (Fredericksen and Fredericksen 2002) and we agreed with the recommended mitigation measures (SHPD DOC NO.: 0207MK09/LOG NO.: 30373). Five sites found during the survey have been recommended for preservation (-5007, -5093, -5095, -5097, and -5098); of these five sites, only two sites (SIHP -5093, and - 5095) are located on the subject property.

2

Dierdre S. Mamiya, Acting Administrator
Page 2

Given the above information, we recommend that the following conditions be attached to the subject CDUA, should it be approved.

1) An acceptable Preservation Plan for Historic Sites - 5093, and - 5095 shall be submitted to the State Historic Preservation Division for review and acceptance. That Division must verify in writing to the County when the plan is successfully executed.

2) An acceptable Data Recovery Plan for site -5094 shall be submitted to the State Historic Preservation Division for review and acceptance, if preservation in place is not an appropriate mitigation measure for this site. If preservation is to occur, it shall be part of the above noted preservation plan. The State Historic Preservation Division must verify in writing to the County when the plan is successfully executed.

If you have any questions, please call Cathleen A. Dagher at 692-8023.

CD:jen

c: Michael Foley, Director, Dept of Planning, 250 South High Street, Wailuku, HI 96793
Cultural Resources Commission, Planning Dept, 250 S. High Street, Wailuku, HI 96793
Chair, Maui/Lana`i Islands Burial Council
Kana`i Kapeliela, Burial Sites Program

PBR HAWAII

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SENIOR ASSOCIATE

TOM SCHNELL, AICP
ASSOCIATE

RAYMOND T. HIGA, ASLA
ASSOCIATE

KEVIN NISHIKAWA, ASLA
ASSOCIATE

HONOLULU OFFICE
1001 Bishop Street
Pacific Tower, Suite 650
Honolulu, Hawaii 96813-3484
Phone: (808) 521-5631
Fax: (808) 521-4078
e-mail: pbrhi@pbrhawaii.com

November 24, 2003

P. Holly McEldowney, Acting Administrator
State Historic Preservation Division
Department of Land and Natural Resources
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

SUBJECT: NGUYEN RESIDENCE DRAFT ENVIRONMENTAL ASSESSMENT AND CONSERVATION DISTRICT USE APPLICATION (TMK 4-4-04: 32 PORTION)

Dear Ms. McEldowney:

Thank you for your memorandum (LOG NO: 2003.2325; DOC NO: 0311CD25) dated November 14, 2003, addressed to Dierdre Mamiya of the Department of Land and Natural Resources regarding the Nguyen Residence Draft Environmental Assessment and Conservation District Use Application (MA-3163). As the planning consultant for the applicant, Mr. Bill Nguyen, we are responding to your concerns.

Xamanek Researchers has prepared a Preservation Plan for the sites recommended for preservation in the archaeological survey. This plan includes preservation measures for sites 5093, 5094, and 5095 on the Kalaepiha Point property. The Preservation Plan has been submitted to the State Historic Preservation for review and acceptance and will be included as an appendix in the final environmental assessment. Since site 5094 will be preserved in place and is included as part of the Preservation Plan, a Data Recovery Plan will not be prepared.

Thank you for participating in the environmental review process.

Sincerely,

Tom Schnell, AICP
Associate

cc: Genevieve Salmonson, Office of Environmental Quality Control
Dierdre Mamiya, Department of Land and Natural Resources
Michael Foley, Director, Department of Planning
Cultural Resources Commission, Planning Department
Chair, Maui/Lana'i Islands Burial Council
Kana'i Kapeliela, Burial Sites Program

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LAND MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS

2003 OCT 21 AM 12:48

Ref.:OCCL:DH

File Number: CDUA MA-3163B

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LAND DIVISION
2003 NOV -3 A 9:4
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

Acceptance Date: October 16, 2003
180 Exp. Date: April 13, 2003
SUSPENSE DATE: 21 Days from stamped date
OCT 22 2003

MEMORANDUM

TO: Historic Preservation Division, Maui Board Member, Division of Forestry and Wildlife (Na Ala Hele), and Maui District Land Agent

FROM: Dierdre S. Mamiya, Acting Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS
Conservation District Use Application (CDUA)
BOARD PERMIT

APPLICANT: PBR Hawaii

FILE NO.: MA-3163

REQUEST: Nguyen Single Family Residence

LOCATION: Located at Kalaepiha Point, Island of Maui

PUBLIC HEARING: YES NO X

Attached, please find a copy of the subject CDUA, and our Department's Notice of Acceptance and Environmental Determination. Please return the CDUA and all attachments. Should you require additional information, please call Dawn Hegger of our Office of Conservation and Coastal Lands staff at 587-0380. If no response is received by the suspense date, we will assume there are no comments.

( ) Comments Attached
(✓) No Comments

Signature

PBR HAWAII

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Hilo Office
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Hilo Lagoon Centre, Suite 310
Hilo, Hawaii 96720-4262
Tel: (808) 961-3333
Fax: (808) 961-3048

November 24, 2003

Mr. Jason K. Koga
Maui District Land Agent
Department of Land and Natural Resources
Maui District Branch, Land Division
54 South High Street, Room 101
Wailuku, Hawaii 96793

SUBJECT: NGUYEN RESIDENCE DRAFT ENVIRONMENTAL ASSESSMENT AND CONSERVATION DISTRICT USE APPLICATION (TMK 4-4-04: 32 PORTION)

Dear Mr. Koga:

Thank you for reviewing the Nguyen Residence Draft Environmental Assessment and Conservation District Use Application (CDUA MA-3163B). As the planning consultant for the applicant, Mr. Bill Nguyen, we have reviewed your response and acknowledge that you have no comments.

Thank you for participating in the environmental review process.

Sincerely,

Tom Schnell, AICP
Associate

cc: Genevieve Salmonson, Office of Environmental Quality Control
Dierdre Mamiya, Department of Land and Natural Resources

LINDA LINGLE
GOVERNOR OF HAWAII

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186
E-mail: oeqc@health.state.hi.us

October 23, 2003

Deirdre Mamiya
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Attention: Sam Lemmo

Dear Ms. Mamiya:

Subject: Draft Environmental Assessment (EA)
Nguyen Single Family Residence, Kalaepiha Point, Maui

We have the following comments to offer:

Commercial use: Is the applicant planning on a bed and breakfast or timeshare operation on this property? The facilities include a living room/kitchen unit detached from several "bedroom suites" which total six bedrooms and six bathrooms, covered walkways connecting the buildings, and a porte cochere and swimming pool as accessories. This layout lends itself to such businesses. Are either allowed in the Conservation District? It is incumbent on the applicant to disclose his intention of allowing commercial uses either immediately or in the future.

Square footage: The size limit of a single family facility in the Conservation District is 5000 square feet. Figure 6a (Site Plan) lists enclosed areas at 4427.82 square feet and covered areas at 1685.41. This totals 6113.23 square feet. Has a variance been granted to allow the total to go over 5000? If so include it in the list of Permits & Approvals in section 3.3.

Cultural impacts assessment: Section 5.2 of the draft EA states, "The Nguyen single-family residence will not interfere with any cultural practices associated with the site or the region." A great deal of information is provided on the archeological and historic resources of the parcel. What methods have you employed to determine the existence of, and impacts to, *current* cultural practices? In the final EA discuss the methods employed in reaching the assessment stated in section 5.2. If you need additional assistance refer to our *Guidelines for Assessing Cultural Impacts*. Go to our homepage at *http://www.state.hi.us/health/oeqc/guidance/index.html* or contact our office for a paper copy.

Contacts: If you received any correspondence from contacts made during the pre-consultation phase include copies in the final EA.

Swimming pool: Is a pool permit required? If so include it in the list in section 3.3.

If you have any questions, call Nancy Heinrich at 586-4185.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director

c: Tom Schnell

PBR HAWAII

LAND PLANNING
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Senior Associate

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Associate

RAYMOND T. HIGA, ASLA
Associate

KEVIN NISHIKAWA, ASLA
Associate

Honolulu Office
[illegible]

Hilo Office
[illegible]

November 24, 2003

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

SUBJECT: RESPONSE TO COMMENTS ON THE NGUYEN RESIDENCE DRAFT ENVIRONMENTAL ASSESSMENT (TMK: 4-4-04: 32 PORTION)

Dear Ms. Salmonson:

Thank you for your letter dated October 23, 2003, addressed to Dierdre Mamiya of the Department of Land and Natural Resources regarding the Nguyen Residence Draft Environmental Assessment (EA). As the planning consultant for the applicant, Mr. Bill Nguyen, we are responding to your concerns.

Commercial Use: The Nguyen residence will not be used for commercial purposes, including bed and breakfast operations, timeshare operations, or transient vacation rentals. This will be stated in the Final EA. Bed and breakfast operations, timeshare operations, and transient vacation rentals are not allowed in the Conservation District. The Nguyen residence will be in conformance with all requirements of the Conservation District. Commercial uses will not be allowed on the property, either immediately or in the future.

Square Footage: The Nguyen residence is in conformance with the Conservation District Single Family Residential Standards (HAR Title 13, Subtitle 1, Chapter 5, Exhibit 4). These standards set forth the floor area computation for single-family residences in the Conservation District:

> *The floor area computation shall include: all enclosed (on three sides minimum, with floor and roof structure above) living areas; above grade decks* [emphasis added] *in excess on 4'-0" in width; garage or carport; swimming pools, saunas or other developed water features (excluding naturally existing ponds, tidepools, etc.); play courts, or any other standing structures, which are accessory to the approved land use.*

Under this provision at-grade decks (i.e., lanais) are not included in the floor area computation. All lanais of the Nguyen residence are at-grade and therefore the areas of the lanais are not included in the floor area computation. The provision also specifies that areas enclosed on three sides shall be included in the floor area computation. The covered walkways connecting the home will only include a floor and a roof; they will not

be enclosed on three sides and therefore the areas of the walkways are not included in the floor area computation.

The above information will be included in the final EA. The final EA also will include a revised Figure 6a in which all areas that are counted in the floor area computation (i.e., "Enclosed Area") are shown in one table and all areas that are not included in the floor area computation area are shown in a separate table.

Cultural Impacts Assessment: You are correct in stating that a great deal of information has been included in the draft EA regarding the archaeological and historic resources of the parcel. Xamanek Researchers conducted an archaeological inventory survey for the coastal area that includes the parcel. Xamanek Researchers also prepared a preservation plan for the sites recommended for preservation in the archaeological survey.

In preparing the archaeological survey and preservation plan, Xamanek Researchers obtained oral history accounts of the area from Mr. William Waiohu of the Maui/Lanai Islands Burial Council and Mr. Aimoku Pali of Honokohau Valley. Erik Frederickson of Xamanek Researchers also visited specific sites on separate occasions with:

- Mr. Leslie Kuloloio of Na Kupuna O Hawaii;
- Mr. William Waiohu of the Maui/Lanai Islands Burial Council;
- Mr. Wesley Nohara, Manager of Honolua Plantation and employee of Maui Pineapple Company Inc., for 34 years.
- Mr. Alexander Ross, descendent of the Koa family and individuals buried in the gravesite discovered on a separate parcel.

Before they were contacted, these individuals were unaware of the existence of the archaeological features discovered during the archaeological survey (with the exception of the historic slaughter house foundation and the portion of the old government road). Regarding the specific Kalaepiha Point parcel, this property has been fenced and gated for many years. Considering these factors, it is reasonable to conclude that individuals currently do not use the property for current cultural practices.

The above information will be included in the final EA.

Contacts: We have not received any written correspondence from contacts made during the pre-consultation phase.

Swimming Pool: While a County building permit is usually required for a swimming pool, it is our understanding that County requirements do not apply to uses with the Conservation District, which are administered by the State Department of Land and Natural Resources. However, the pool will be constructed in accordance with all standards for swimming pools.

Thank you for participating in the environmental review process.

Sincerely,

Tom Schnell, AICP
Associate

cc: Dierdre Mamiya/Department of Land and Natural Resources

11-21-03; 2:30PM;

ALAN M. ARAKAWA
Mayor

GILBERT S. COLOMA-AGARAN
Director

MILTON M. ARAKAWA, A.I.C.P.
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS AND ENVIRONMENTAL MANAGEMENT
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

TRACY TAKAMINE, P.E.
Wastewater Reclamation Division

LLOYD P.C.W. LEE, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

JOHN D. HARDER
Solid Waste Division

November 18, 2003

RECEIVED
LAND DIVISION
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DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

Ms. Dierdre S. Mamiya, Acting Administrator
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
P. O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Mamiya:

SUBJECT: CONSERVATION DISTRICT USE APPLICATION
NGUYEN SINGLE-FAMILY RESIDENCE
TMK: (2) 4-2-004:032
CDUA MA-3163

We reviewed the subject application and have the following comments:

1. Submit plan for disposal and composting of cleared and grubbed material and disposal and recycling of construction waste.

2. The design of the proposed single-family residence does not conform to the Maui County Housing Code.

If you have any questions regarding this letter, please call Milton Arakawa at (808) 270-7845.

Very truly yours,

for GILBERT S. COLOMA-AGARAN
Director

GSCA:MA:jlh
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PBR HAWAII

LAND PLANNING
LANDSCAPE ARCHITECTURE
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e-mail: pbrhilo@pbrhawaii.com

November 25, 2003

Gilbert S. Coloma-Agaran, Director
County of Maui
Department of Public Works and Environmental Management
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: NGUYEN RESIDENCE CONSERVATION DISTRICT USE APPLICATION AND DRAFT ENVIRONMENTAL ASSESSMENT (TMK 4-4-04: 32 PORTION)

Dear Mr. Coloma-Agaran:

Thank you for your letter dated November 18, 2003, addressed to Dierdre Mamiya of the Department of Land and Natural Resources regarding the Nguyen Residence Conservation District Use Application (CDUA MA-3163). As the planning consultant for the applicant, Mr. Bill Nguyen, we are responding to your concerns.

1) Green waste from cleared and grubbed material will be disposed of in one of the Kapalua Report's green waste recycling and composting areas that are currently used as part of the Resort's golf course operations.

Construction waste such as drywall may be recycled if a local recycling vendor is available. During construction, whenever practical, solid wastes will be minimized and recycled. It will be recommended to contractors that a job-site recycling plan should be developed and, as much as possible, construction wastes should be recycled. Construction wastes that cannot be recycled will be disposed in the County's construction and demolition landfill near Maalaea.

This information will be included in the final environmental assessment.

2) You do not identify a specific reason why the Nguyen residence is not in compliance with the Maui County Housing Code. Because of this, we are unable to respond specifically to your comment. However, the County Housing Code regulates housing by virtue of the County's zoning authority under state law (see Code Section 16.08.020), which does not extend to the conservation district (see Section 205-5(a), HRS). Rather the authority to regulate dwellings in the conservation district falls to the Department of Land and Natural Resources, pursuant to Section 183C-6, HRS, and its implementing regulations, the Conservation District Rules (HAR Title 13, Subtitle 1, Chapter 5). The Nguyen residence is in compliance with the Conservation District Rules.

Thank you for participating in the environmental review process.

Sincerely,

Tom Schnell, AICP
Associate

cc: Dierdre Mamiya/Department of Land and Natural Resources
Genevieve Salmonson/Office of Environmental Quality Control

LIFE OF THE LAND

Ua Mau Ke Ea O Ka 'Aina I Ka Pono

76 North King Street Suite 203 * Honolulu, Hawai'i 96817
Phone: 533-3454 * E-mail: lifeoftheland@hotmail.com

November 11, 2003

Mr. Bill Nguyen c/o PBR HAWAI'I
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawai'i 96813

Department of Land & Natural Resources
P. O. Box 621
Honolulu, Hawai'i 96809
Attention: Sam Lemmo

Office of Environmental Quality Control
235 South Beretania Street ~ Suite 702
Honolulu, Hawai'i 96813

COMMENTS ON ENVIRONMENTAL ASSESSMENT
FOR NGUYEN SINGLE-FAMILY RESIDENCE
KALAEPIHA POINT, WEST MAUI, HAWAI'I
TMK: 4-2-04:32

Aloha!

Life of the Land, Hawai'i's own environmental and community action group has been advocating for the people and the 'aina since 1970. Our mission is to preserve and protect the life of the land through sustainable land use and energy policies and to promote open government through research, education, advocacy, and litigation.

Life of the Land has been actively engaged in protecting our precious conservation area for decades. In fact, land is designated 'Conservation' because of the high public value we, in Hawai'i, attached to our vistas, our viewplanes, and our precious ocean resources. Conservation land, especially that in our Special Management Area, is an important asset to the public. Preservation of our 'blue views' is significant to the people of Hawai'i.

We have reviewed the above-reference Environmental Assessment and have some concerns:

Size of Development:

Section 2.2 states: "The floor area of 4,428 square feet for all enclosed (on three sides minimum, with floor or roof structure above) living areas, above grade decks (in excess of 4'-0" in width), and the swimming pool is under the 5,000 square foot maximum allowed for homes on lots larger than one acre.

Our understanding of the Conservation District rules is that the maximum square footage permitted under roof (aka covered) is 5,000 square feet. We don't understand how you calculated the square footage as 4,428 square foot. How you arrived at that number?

A calculation of the figures given in the EA in Figure 6a shows:

LOCATION	AREA
01 Master Suite	744.00 square feet
01 Master Suite Lanai	96.00 square feet
02 Living Room	1,269.00 square feet
02 Living Room Lanai	646.83 square feet
03 Bedroom Suite	1,314.55 square feet
03 Bedroom Suite Lanai	110.23 square feet
04 Guest Master Suite	620.27 square feet
01-02 Covered Walkway	87.94 square feet
02-03 Covered Walkway	200.12 square feet
Gazebo	144.11 square feet
Porte Cochere	400.18 square feet
	5,633.23 square feet

On page 13 - Section 3.2.1 General Plan B. *Land Use* - Discussion: the EA states: "Given the fact that development on the site will be limited to one single-family residence with a floor area no greater than 5,000 square feet (including all above grade buildings, decks, carports, or other standing structures)...." This indicates to us that the developer understands that the 5,000 square foot limit includes ALL covered areas proposed. Therefore, this proposed development is too large for the Conservation District.

Several Separate/Un-Connected Buildings on Property:

Another problem is that Master Bedroom No. 2 is separate/unconnected from the main area. The Port Cochere and the Gazebo are unconnected as well. It is our understanding that all covered areas (which are limited to 5,000 square feet) must be connected. This is why many developers have used 'breezeways' to connect separate buildings and thus circumvent the Conservation District rules by claiming that all the buildings are connected...so they are really one building. This is not the case in this development. There are actually 6 buildings on the property, but only three are connected with walkways.

Use of this 'Single-Family' Home:

How big is the Nguyen family? Is this a primary home for this family? If it is to be a second home -- a vacation home -- how often will the Nguyen family be in residence there? Will the property be vacant when the Nguyen family is not there? Will there be a caretaker on the property? If so, will the caretaker live there full time?

Shoreline Access:

The document says that shoreline access will be preserved. How do people access the shoreline now? Are there any easements or access points on this property now? Please include map(s) and description of shoreline access in the final document. What the county rules pertaining to shoreline access?

Screening of Property:

The document mentions that the house will not be seen from Honoapi'ilani Highway because it will be built up against the bluff. Is there an ocean view/blue view now from Honoapi'ilani Highway? Section 5.6 VISUAL RESOURCES - *Potential Impacts and Mitigation Measures* states, "...the primary view of Honolua Bay upon driving north along Honoapi'ilani Highway will not be obscured by the residence." Will the ironwoods screening the property obscure the blue view from Honoapi'ilani Highway? Blue Views are a community asset and it is not unusual for communities to place high value on the preservation of Blue Views from coastal highways and roads.

Traffic:

How many cars are expected to enter and exit the property daily? We note the hairpin turn near the property and this gives us cause for concern.

No Commercial Use Allowed on Conservation Land:

A big concern for communities is improper use of Conservation land. This development with the bedrooms in separate buildings and one kitchen looks like it could be an upscale bed and breakfast. Life of the Land wants to underscore the importance of the 'conservation' designation; single family homes are allowed, but no commercial use is permitted on conservation land.

Mahalo for this opportunity to review the Draft Environmental Assessment for the Nguyen Residence. We look forward to your response to our concerns.

Sincerely,

Kat Brady
Assistant Executive Director

PBR HAWAII
LAND PLANNING
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL STUDIES

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TOM SCHNELL, AICP
Associate

RAYMOND T. HIGA, ASLA
Associate

KEVIN NISHIKAWA, ASLA
Associate

Honolulu Office
[illegible]

November 24, 2003

Ms. Kat Brady, Assistant Executive Director
Life of the Land
76 North King Street, Suite 203
Honolulu, Hawaii 96817

SUBJECT: RESPONSE TO COMMENTS ON THE NGUYEN RESIDENCE DRAFT ENVIRONMENTAL ASSESSMENT (TMK: 4-4-04: 32 PORTION)

Dear Ms. Brady:

Thank you for your letter dated November 11, 2003, regarding the Nguyen Residence Draft Environmental Assessment. We offer the following responses to your comments:

Size of Development: The Nguyen residence is in conformance with the Conservation District Single Family Residential Standards (HAR Title 13, Subtitle 1, Chapter 5, Exhibit 4). These standards set forth the floor area computation for single-family residences in the Conservation District:

> *The floor area computation shall include: all enclosed (on three sides minimum, with floor and roof structure above) living areas; above grade decks* [emphasis added] *in excess on 4'-0" in width; garage or carport; swimming pools, saunas or other developed water features (excluding naturally existing ponds, tidepools, etc.); play courts, or any other standing structures, which are accessory to the approved land use.*

Under this provision at-grade decks (i.e., lanais) are not included in the floor area computation. All lanais of the Nguyen residence are at-grade and therefore the areas of the lanais are not included in the floor area computation. The provision also specifies that areas enclosed on three sides shall be included in the floor area computation. The covered walkways connecting the home will only include a floor and a roof; they will not be enclosed on three sides and therefore the areas of the walkways are not included in the floor area computation.

The above information will be included in the final EA. The final EA also will include a revised Figure 6a in which all areas that are counted in the floor area computation (i.e., "Enclosed Area") are shown in one table and all areas that are not included in the floor area computation area are shown in a separate table.

Several Separate/Un-Connected Buildings on Property: The architectural plans have been revised to include a covered walkway to connect the bedroom that previously was not connected to the rest of the home. In addition, the porte cochere has been eliminated

from the plan. The gazebo remains unconnected, however the Conservation District rules call for "All structures connected, or best alternative." Since the gazebo is an accessory structure to the pool, it is reasonable for it to be separate from the home and represents the best alternative in this situation. The revised architectural plans will be included in the final EA.

Use of this 'Single-Family' Home: The number of members in the Nguyen family is not relevant. Mr. Nguyen has not stated his intention as to whether this will be his family's primary home. It has not been decided if there will be a caretaker on the property, however the home will be properly maintained.

Shoreline Access: Steep cliffs along the shoreline fronting the Kalaepiha Point property limit shoreline access from the top of the property, however existing shoreline access from the properties adjacent to the Kalaepiha Point parcel allow access to the coastline. This is stated in several sections of the draft EA. There are no easements or access points on the Kalaepiha Point property.

Figures 3 and 5 of the draft EA contain topographic maps illustrating the topography in front of the Kalaepiha Point property and the adjacent properties. From the topographic map it can be seen that it would be very difficult, if not impossible, to access the shoreline from the cliffs in front of the Kalaepiha Point property. The topographic map also shows that the adjacent properties with less steep cliffs would provide the logical access to the shoreline in front of the Kalaepiha Point property. Cliffs in front of the Kalaepiha Point property can also been seen in the photographs of the property contained in Figure 4B and 4C of the draft EA

Screening of Property: There is not an "ocean/blue" view from Honoapiilani Highway across the Kalaepiha Point property to the ocean. Because of existing bluffs and vegetation, the ocean cannot be seen from the highway looking across the Kalaepiha Point property. This is shown in photographs contained in Figure 4A of the draft EA. The relationship of the property to Honoapiilani Highway, along with topographic features can be seen on Figures 3 and 5 of the draft EA. Any additional landscaping on the Kalaepiha Point property will not result in the loss of ocean views from Honoapiilani Highway.

Honolua Bay is to the north of the Kalaepiha Point property. The section of Honoapiilani Highway in front of the Kalaepiha Point property runs north-south, with the Kalaepiha Point property to the west. So the statement in the draft EA that says "the primary view of Honolua Bay upon driving north along Honoapiilani Highway will not be obscured by the residence" is accurate. Please refer to Figures 3 and 5 of the draft EA.

Traffic: As stated in Section 5.3 of the draft EA "...only one family will live on the site. Accordingly, any additional traffic in the area as a result of the residence will be limited to that of a single family."

No Commercial Use Allowed on Conservation Land: The Nguyen residence will not be used for commercial purposes, including bed and breakfast operations, timeshare operations, or transient vacation rentals. This will be stated in the Final EA. Bed and breakfast operations, timeshare operations, and transient vacation rentals are not allowed in the Conservation District. The Nguyen residence will be in

conformance with all requirements of the Conservation District. Commercial uses will not be allowed on the property, either immediately or in the future.

Thank you for participating in the environmental review process.

Sincerely,

Tom Schnell, AICP
Associate

cc: Dierdre Mamiya/Department of Land and Natural Resources
Genevieve Salmonson/Office of Environmental Quality Control

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Appendix A

Archeaological Inventory Survey Report and Preservation Plan

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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BOATING AND OCEAN RECREATION
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS

July 25, 2002

Mr. Erik Fredericksen
Xamanek Researches
P.O. Box 880131
Pukalani, Hawai'i 96788

LOG NO: 30373
DOC NO: 0207MK09

Dear Mr. Fredericksen,

SUBJECT: **Historic Preservation Review - 6E-42 - Archaeological Inventory Survey 23 Acre Coastal Property for Kapalua Land Co.**
Honolua Ahupua'a, Lahaina District, Maui
TMK (2) 4-2-4:32

Thank you for the opportunity to review the revisions for this report which our staff received on June 27, 2002 (Fredericksen and Fredericksen 2002, *An Archaeological Inventory Survey Of a c.23 Acre Coastal Property in Honolua ahupua'a, Lahaina District, Maui island, TMK 4-2-04:32*...Xamanek ms.).

The revised pages included minor changes in text, the addition of a map indicating the areas in which previous archaeological work have been conducted, and additions to the references.

We previously agreed that this report was acceptable, with the condition that the minor changes in the Attachment be submitted to our Maui and O'ahu offices. All of our concerns have now been addressed.

Aloha,

Don Hibbard, Administrator
State Historic Preservation Division

MK:jen

c: John Min, Director, Department of Planning, County of Maui, FAX 270-7634
Bert Ratte, County of Maui, Land Use and Codes, FAX 270-7972
Glen Ueno, County of Maui, Land Use and Codes, FAX 270-7972

An Archaeological Inventory Survey
Of a c. 23-Acre Coastal Property
in Honolua *Ahupua`a*,
Lahaina District, Maui Island
(TMK 4-2-04: 32)

Prepared for:
Kapalua Land Company, Ltd.
Kapalua, Maui

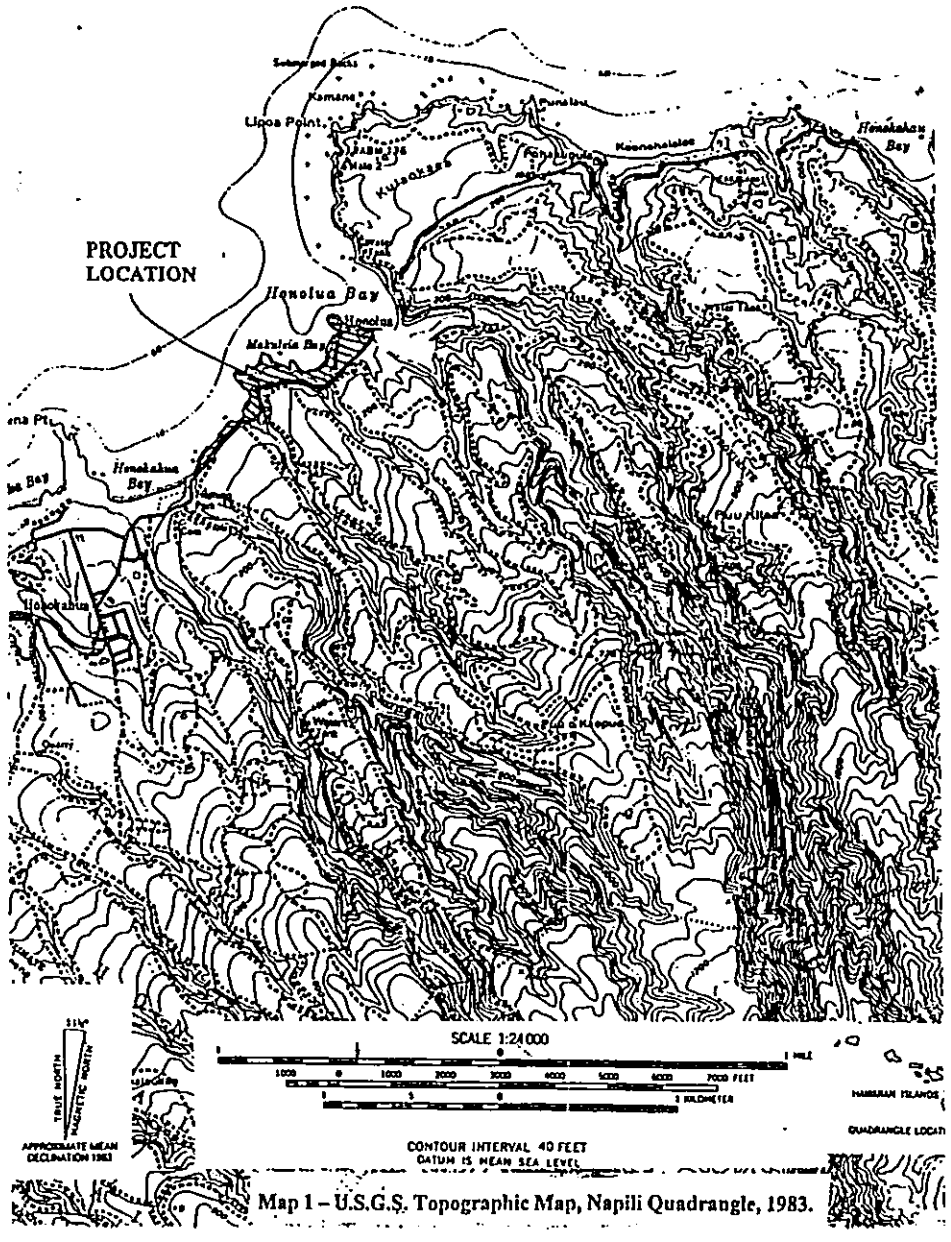
Prepared by:

Erik M. Fredericksen
Demaris L. Fredericksen

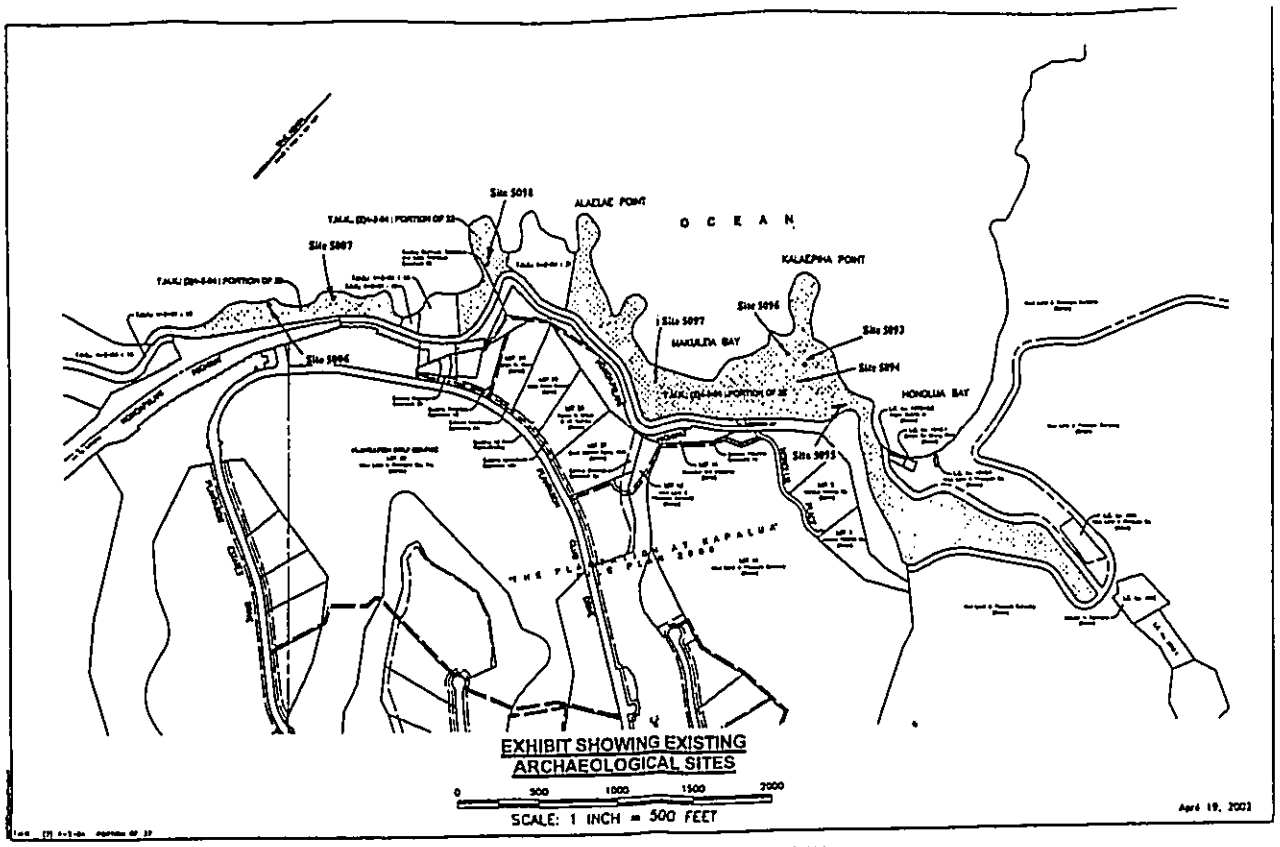
Xamanek Researches
Pukalani, Hawaii

May 1, 2002
(Revised June 25, 2002)

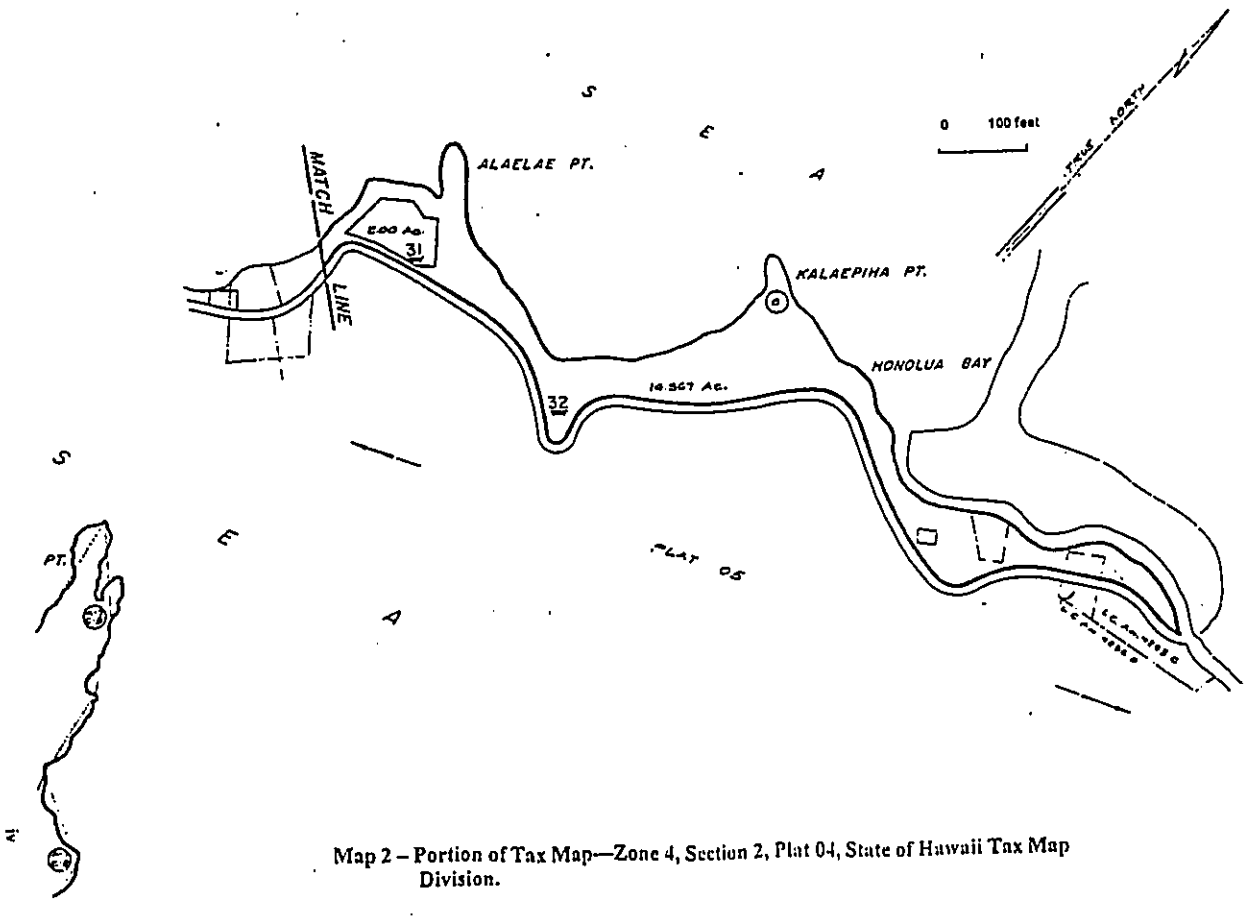
Table of Contents



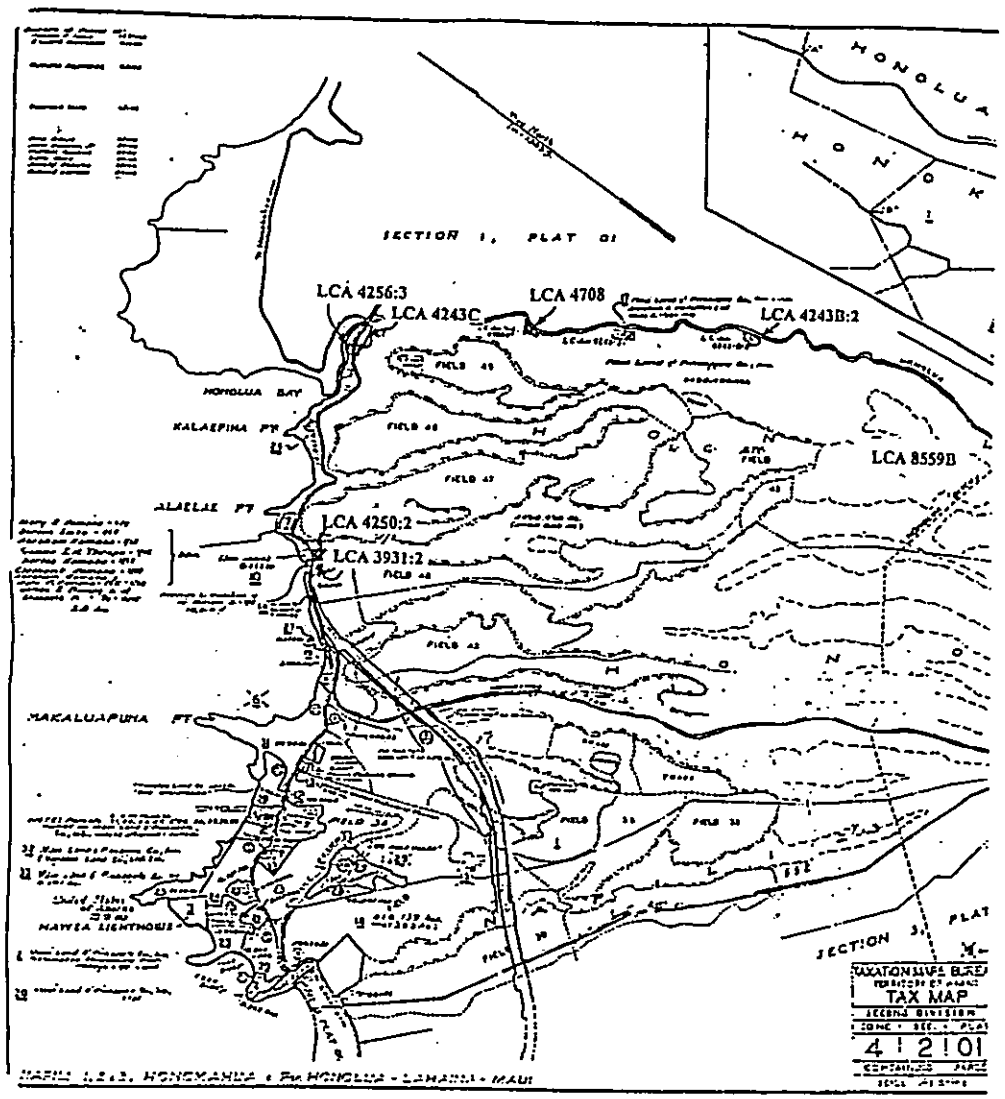
Map 1 – U.S.G.S. Topographic Map, Napili Quadrangle, 1983.



Map 3 – Location of sites recorded during 2001 inventory survey.



Map 2 – Portion of Tax Map—Zone 4, Section 2, Plat 04, State of Hawaii Tax Map Division.



Map 4 – Tax Map 4-2-01, showing some of the LCAs in Honolua *Ahupua'a*.

INTRODUCTION

Xamanek Researches was contacted by Kapalua Land Company, Ltd. in the late fall of 2000 about conducting cultural impact assessment studies for two project areas—a coastal parcel of approximately 23 acres in Honolua and a c. 475 acre parcel in Honokahua and Napili. It was subsequently determined that both project areas required archaeological inventory surveys as well. We were asked to submit proposals for the required work. Our proposals were accepted, and we were subsequently retained to carry out the necessary work on the *makai* 23-acre parcel (TMK 4-2-04: 32).

The present project area lies *makai* (west) of Honoapi'ilani Highway, in Honolua *ahupua'a*, Lahaina District. This elongated parcel is an estimated 1.3 km. in length and varies from c. 25 meters to up to 250 meters in width. Fieldwork for our inventory survey was conducted during the spring of 2001.

This study was carried out in accordance with the current standards governing inventory level surveys as required by the Department of Land and Natural Resources, State Historic Preservation Division.

Study Parcel

This narrow parcel undulates along the shoreline of Mokuleia and Honolua Bays. At two places, near Alaelae Point and Kalaepiha Point, Honoapi'ilani Highway moves further inland. The elevation of the study area extends from sea level to as much as c. 80 feet AMSL.

The soils in the area consist of Molokai silty clay loam of the Waiakoa-Keahua-Molokai association, which occur over *pahoehoe* rock. These well-drained soils are formed from material weathered from basic igneous rock. They range from nearly level to relatively steep, and extend up to 1000 feet in elevation (Foote et al., 1972). Rainfall amounts to about 20-30 inches per year, and the vegetation in the project area can be quite dense. It consists of introduced species, including *koa haole* (Leucaena glauca), ironwood (Casuarina equisetifolia), Christmasberry (Schinus terebinthifolius), red hibiscus (Hibiscus rosa-sinensis), *hau* (Hibiscus tiliaceus), night-blooming cereus (Hylocereus undatus), and various shrubs, grasses and annual weeds

BACKGROUND HISTORICAL INFORMATION

This portion of West Maui was not as heavily populated in precontact times, as was the windward side of the island. The project area extends along the coastline *makai* of Honoapi'ilani Highway from Kalaepiha Point to near the entrance of Plantation Estates. The northern boundary of the project area lies on Kalaepiha Point and overlooks Honolua Bay.

Precontact and early post-contact times

The study region is situated to the north of Lahaina. There are 5 large valleys in this western portion of the West Maui Mountains. They are Honokawai, Kahana, Honokahua, Honolua, and Honokahau. Handy and Handy (1972, pg. 494) note:

"The first four all had extensive lo'i lands in their valley bottoms, where terraces rose tier on tier in symmetrical stone-faced lo'i. On this part of the coast there is no sloping kula land seaward of the valleys as there is back of Lahaina and southeastward. Honokohau in particular, which is watered by a large rivulet flowing from far back in the mountains, had the most extensive system of lo'i along this coast."

The 5 valley agricultural systems no doubt supplied much of the food required by a fair-sized population, which lived in clusters at the mouths of them. These were linked together by the "*ala loa*" (long path)—a trail system which was said to have been built by Kiha-a-Pi'ilani, son of Pi'ilani, in the early 1500s. Walker (1931, p. 301) notes:

"The north end of West Maui also is traversed by a paved trail. Sections of it can bee seen from Honolua to Honokohau and Kahakuloa. It is paved with beach rocks and has a width of four to six feet. Disregarding elevations and depressions it takes the shortest route between two points that is possible for foot travel. This trail is also spoken of as the Kihapiilani Trail."

According to Martha R. Fleming (1933, p. 3-9), as reported in Handy and Handy (1972), much of the *Alaloa* had been covered or obliterated during the course of road building in the late 19th and early 20th century. The route of the present Honoapi'ilani Highway probably covers this ancient feature in the coastal region of Honolua *ahupua'a*.

The traditional district or *moku* of Ka'anapali was the location of one of the encounters between chiefs of Maui and the Island of Hawaii, as they struggled for ascendancy. Samuel Kamakau (1992, p. 74) tells about the conflict that took place in

1738, after an entire year of preparation by the Big Island chief Alapa'i. He states:

"What was this war like? It employed the unusual method in warfare of drying up the streams of Kaua'ula, Kanaha, and Kahoma (which is the stream near Lahainaluna). The wet taro patches and the brooks were dried up so that there was no food for the forces of Ka-uhi or for the country people. Alapa'i's men kept close watch over the brooks of Olowalu, Ukumehame, Wailuku and Honokawai. When Pele-io-holani[1] heard that Alapa'i was at Lahaina he gathered all his forces at Honokahua and at Honolua. At Honokawai an engagement took place between the two armies and the forces of Alapa'i were slaughtered and fled to Keawawa. There Alapa'i heard that Pele-io-holani had landed at Honokahua and had an army stationed at Keawawa, and he disposed his forces, some on sea and some on land. Although Pele-io-holani had but 640 men against Alapa'i's 8,440 from the six districts of Hawaii, there were among them some famous warriors. ...Pele-oi-holani intended to unite his forces with those of Ka-uhi, but Alapa'i's men held Lahaina from Ukumehame to Mala on the north...Pele-oi-holani was surrounded on all sides, mauka and makai, by the forces of Alapa'i.... The two ruling chiefs met there again, face to face, to end the war and become friends again, so great had been the slaughter on both sides...."

The post-contact land management in this region is discussed by Silva (1986) and is summarized here. In the late 18th or early 19th century, Kamehameha I gave the entire *ahupua'a* of Honokahua to Isaac Davis, in return for his help during Kamehameha's wars of conquest. Davis, along with another Englishman named John Young, had been "detained" by Kamehameha. Davis' ship, the Fair American, had been captured and all aboard except him had been killed. Young was kept ashore until his ship, the Eleanora departed without him. Both men were treated so well by Kamehameha that they were quite willing to remain with him, acting as his advisors while he consolidated his power within the islands. Kamehameha gave both men large tracts of land in northwest Maui.

Upon the sudden death of Isaac Davis in 1810, his land holdings in Honokahua were managed by John Young. When Young died in 1835, the land was divided among both Young's and Davis' heirs. During the Mahele in 1848, a formal 2,650-acre grant—the entire ahupua'a of Honokahua—was awarded formally to Davis' daughter, Kale (Sally) Davis (LCA 8522B, RP 2236), who was the wife of Alexander Adams, another favorite of Kamehameha I.

A census taken in 1831 estimated that the entire population of Ka'anapali totaled only 8.5% of the island total of 35,062—about 2,980 (Schmitt, 1973, p. 18). By 1836, it had dropped to about 5.5% of the island total—1,341 (Ibid., p. 38).

Land Commission Awards

There are 19 Land Commission Awards recorded in Honolua *ahupua'a* in Ka'anapali District that are included on the Waihona 'Aina database. In the Index of Awards, there are 37 awards listed in Honolua *ahupua'a*, but several listings appear to

[1] Pele-io-holani was chief of Oahu, and an ally of Ka-uhi, a son of Kekaulike. Another name for Ka-uhi is Ka'ihu-pu-mai-ka-hoaka—Ka-uhi-covered-by-the-shadow-of-the-cresent-moon (Kamakau, p. 73).

represent separate *apana* under a single Royal Patent award. Most are scattered in the valley, and were awarded for taro production, sweet potato production, *kula* and/or house lots. By far the largest was to William C. Lunalilo (Kamehameha IV), which consisted of 3860 acres—nearly the entire *ahupua'a* (LCA 8559B). A few native *kuleana* parcels were awarded. Four are shown on tax map 4-2-01, located just *mauka* (southeast) of the highway. Two (LCA 4243C, and LCA 4256:3) are situated at the mouth of Honolua Stream, and two (LCA 3931:2 and LCA 4250:2) near the entrance to the Plantation Estates. None are on the area presented in this report. Other LCAs (4243B and 4708) on the chart below are spaced along Honolua Stream (Refer to Map 4), and included for additional information on land use in Honolua *ahupua'a*.

Table 1

Land Commission Awards in Project Vicinity

LCA #	Location—*ili*	Awardee	R.P. #	Area	Usage
3803:1	Moomuku	Lalahua	3349	-	Houselot and *kula*
3931:2	Kahauiki	Naiwimawaho	6962	3.42	*Kula uala*, pasture
4243C	-	Kauwewahine	4765	3.06	Potato *mo'o*
4256[2]	Papahao	Kenao	4189	2.0 acs.	-
	Kauhihonohono	Kenao	4189	1.01 ac.	-
	Kauhuhonohono	Kenao	4189	1.43 ac.	-
4243D:2	Kaluaokalaiwahine	Makaole	4188	4.33 ac.	*Kula uala*
4250:2	Kaluanui	Kaui	4776	12.29 ac.	*Kula uala*, pasture
4243B:2	Kukuikanu	Kukalehua	4781	1.83ac.	Pasture
4708:2	Kaea	Mahuka	----	11.408 ac.	*Kalo* land *makai*

LCA 4243C to Kauwewahine.
N.R. 155v6[3]
Greetings to the Land Commissioners: I hereby petition you for my six lo'i, two potato kihapai. The names of the potato mo's are Naioio and Pahahao.
Four potato mo'o are at Kaohe, and 'Ili of Honolua, also the house lot.
The land of my wahine, Named Kaluaokaliiwahine, has 26 lo'i . The mo'o waihae* 17 + 10+27, and also a small potato kihapai are at Pakihi.
HELUPOINA ma
F.T. 371v7[4]
This claim is included under the No. 4243 but no number is given to it. Makaole, swom, The claimant's land is one piece in Pahiki, Honolua. The claimant received it from Keliipoina in 1837 or before. His title was never disputed. It is a kula land.

[1] These were not found in the Waihona 'Aina database. Information is taken from the Index of Awards.
[3] N.R. refers to the Native Register testimony.
[4] F.T. refers to Foreign Testimony.

N.T. 229v5[5]
This claim is with no. 4243 Keliipoina, work done on June 21, 1849. Makaole, sworn, He has seem Kauwewahine's section at the ili of Pahiki in Honolua. Land from Keliipoina before 1827, no objection to this potato pasture.

LCA 3931 (3 *apana*) to Naiuinawaho, Kaanapali, January 18, 1848.
N.R. 138v6
Greetings to the Land Commissioners: I hereby petition for my land claim. I have an area of land in the ku of Kahauiki, which is named Puaakea. I also have a house lot in Kahauiki, Honolua.
F.T. 272v7
Haulili, sworn, I know the lands of the claimant. They are in Kahauiki, Honolua. They are in 3 pieces.
No. 1 is a kula land.
No. 2 is a kula uala.
No 3 is a kula iuka loa.
The claimam received these lands from Naiinu long before 1839 in very ancient times and his title has never been disputed.
N.T. 138v5
Hauili, sworn, Naiuinawaho's lands are in the ili of Puaakea in Honolua consisting of threepasture sections. This land was from Nalimu during Hoapili's time. No objections...

LCA 4243B (7 *apana*) to Kukalehua, 3.42 acres, January 18, 1848.
F.T. 370v7
This claim is in the same paper with No. 4243 but is not numbered.
Makaole, swom, the claimant's lands are 7 pieces in Honolua.
The claimant received these lands from his ancestors in ancient times and has possessed them in peace from the days of Kamehameha I. There are 2 poalima lois in piece No. 6.
F.T. 370v7
Makaole, swom, the claimant's lands are 7 pieces in Honolua.
No. 1 is a kula land in Kukuikanu.
No. 2 is a kula land in Kukuikanu.
No. 3 is a kula land in Kukuikanu.
No. 4 is a kula land in Kukuikanu.
No. 5 is a kalo land in Papahao.
No. 6 is a kalo land in Malili.
No. 7 is a kula land in Kukuikanu.
N.T. 227-228v5
June 29, 1849
This is very old land since the time of Kamehameha I, no objections. Two poalinas in Malili.

[5] N.T. refers to Native Testimony.

LCA 4708 to Mahuka, Honolua, January 19, 1848—11.408 acres.
N.R. 193v6
Greetings to the Land Commissioners: I hereby petition for my land claim. There are 37 lo'i. There are 18 mo'o waihae*[6] and 2 mo'o lauhala, a total of 20. Furthermore, there is the kula, in the 'Ili of Kaea, in Honolua. MAKUHA
F.T. 376-377v7
Kaaiakaia, sworn, I know the lands of Mahuka. They are in the ili of kaea, Honolua.
No. 1 is a kalo land makai.
No. 2 is a kalo land makai.
No. 3 is a kalo land uika loa.
No. 4 is a kula land uika loa.
No. 5 is a kula land uika loa.
The claimant received these lands from his ancestors in the days of Kamehameha I and his title has never been disputed.
No. 2 is bounded:
Mauka by the ili of Hikiapo
Lahaina by the pali of Honolua
On other two sides by the creek of Honolua.

Of the four LCAs shown on the tax map that lie closest to the project area, three were used for sweet potato production and/or for pasturelands. Information of land use for the fourth one was not found, indicating that it may not have been awarded. In any event, its similar location would suggest a similar use. Of the LCAs shown on the tax map that are situated along the *mauka* reaches of Honolua valley, one was for *taro lo'i*, and the other for pastureland.

Post-1850s—Honolua Ranch era

The population of West Maui continued to decline in the second half of the 19th century following the collapse of the Pacific whaling industry in the 1860s. This collapse was prompted by the discovery of oil in Pennsylvania a decade or so earlier. Those who had worked in the support occupations for supplying whaling ships since the 1840s, had to look elsewhere for their livelihood.

In Lahaina, sugar production was developing, while to the north in Ka'anapali district, other options such as ranching and cultivation of different crops began to emerge. These new crops included coffee and pineapples. The lands of Kale Davis became part of the Campbell Estate in the later part of the 19th century. Honolua Ranch was also established, and pioneered cattle ranching in this region of Maui.

In 1890, Henry Perrine Baldwin, the son of missionary Dwight Baldwin, visited Honolua. Here he met with Richard C. Searle and his wife—a Hawaiian Chiefess, who was a descendent of the Kamehameha, Konia, Lunalili, Davis and Young families. Here the families lived in the "old style" raising cattle and horses, raising *taro* in Honokohau, and fishing along the coast. Baldwin saw an opportunity for putting lands into

[6] According to Pukui and Elbert (p. 348): "Agricultural land term commonly used in the 1840s, especially on Maui; meaning unknown."

production, and around 1892 began leasing the Campbell lands, including Honolua Ranch. Richard Searle was hired as manager and continued the ranching activities and initiated coffee production. The coffee venture proved unprofitable, and was soon terminated. Eventually, Baldwin acquired the Campbell-Damon holdings in Honolua and Honokahau, and the lands of various families including descendants of Kale Davis and James Young Kanehoa (Ashdown, 1972).

Following Baldwin's death in 1911, David T. Fleming became manager of Honolua Ranch. He had had experience with pineapple growing in Haiku, and gradually began shifting the focus of the ranch to pineapple production. In 1915, the Honolua Ranch/Baldwin Packers complex was moved from Honolua to Honokahua. A pineapple cannery was built, as were the Honolua Stables. By the 1920s, pineapple was being grown in West Maui on a large scale, becoming the dominant crop of the region (Ibid.).

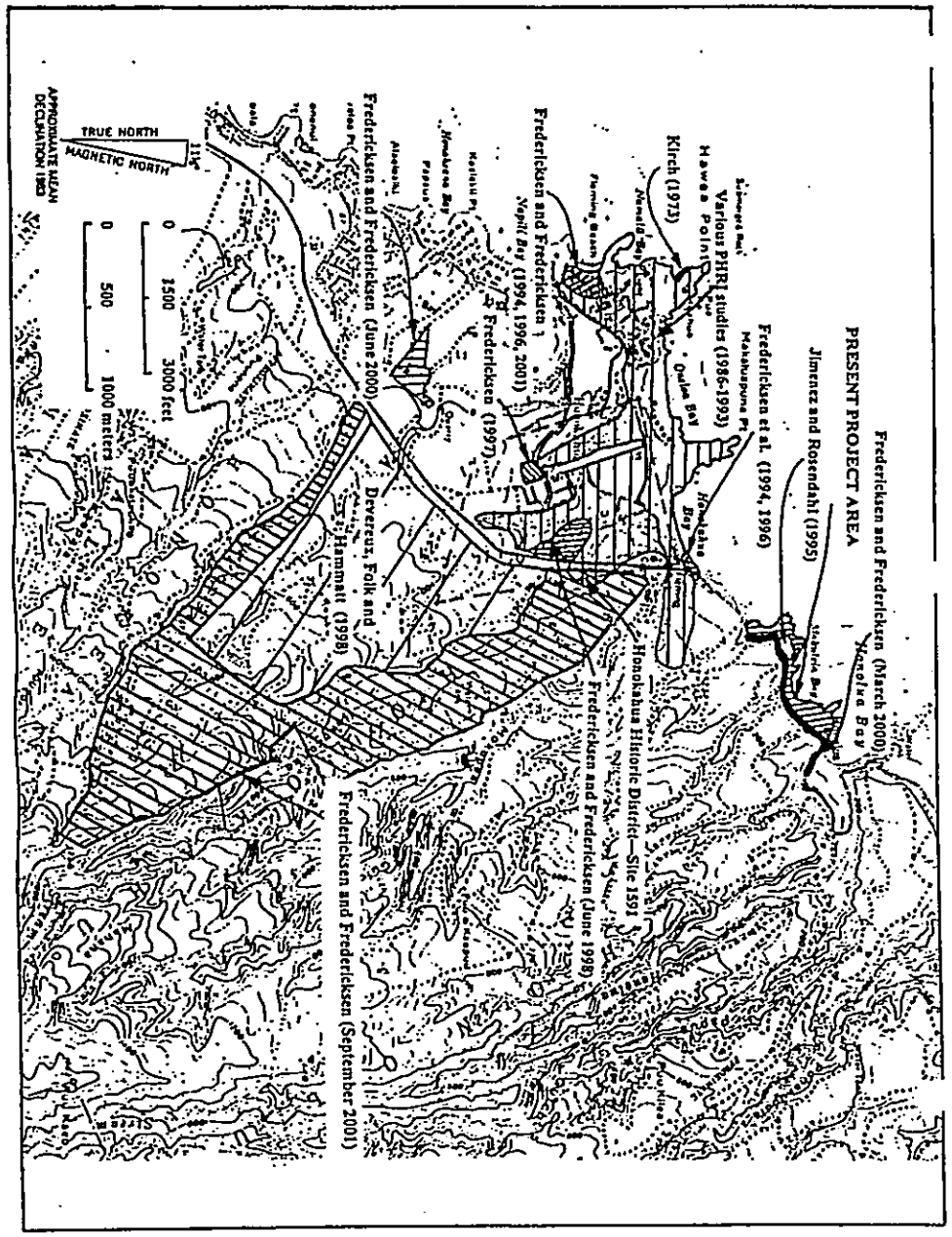
The small plantation communities of Honokahua and Napili developed around the Honolua Ranch/Baldwin Packers pineapple operations, and the population of Lahaina District increased in the first 4 decades of the 20th century. Honolua Stable ceased operation in c. 1963, following the merger of Baldwin Packers with Maui Land and Pineapple Company. As early as 1964, Maui Land and Pineapple Co. began planning resort development, which has culminated in the Kapalua/Ritz-Carlton complex that exists today.

Oral History

In 1995, Mr., Clement Kamaka was interviewed by Kepa Maly (PHRI, Jimenez and Rosendahl, 1995, p. B-6) as part of an inventory survey being conducted on a coastal parcel at the southern end of the current project area.

The parcel under study in 1995 contains the Kamaka family gravesite (Site 4142), according to Mr. Kamaka.[7] He was raised by his *tutu* until 1941, when the family moved to Oahu to pursue employment. Each summer he and his brothers and sisters returned to Maui and stayed with *tutu*—Julia Koa. They helped maintain the family gravesite and fished from the point. His grandmother taught them to spot fish and undertake various kinds of fishing—diving in Mokuleia and Kahauiki bays, and bamboo pole fishing using *opihi* for bait. They also would join in night fishing with the *hukilau* at Honolua Bay. A fish spotter stood on the point below the slaughterhouse and directed the boats to net the *akule*.

[7] Mr. Kamaka was born in c. 1937.



Map 5 – Previous archaeological work in vicinity of project area.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Three *heiau* are located in the general coastal area in fairly close proximity to the study corridor. These were recorded during the survey done by Winslow Walker in 1929-1930 (Walker, 1931). One is located in the Honokahua—Site 16, and two are in Honolua—Sites 17 and 18. Site 16 is identified as Kahuaiki *heiau*, and is described as follows: "A small irregular platform of stones whose walls have been taken for stock pens." Its location is noted as "*mauka* to Kahauiki Camp a short distance up the west side of a gulch of the same name." (Ibid., p. 119). Site 17 is identified as Puhalakau (Ai Maia) *heiau*. Its location is "*makai* to Honolua Park along shore." Its description reads: "Heiau for Kuula. Level space showing some paving with small stones. Modern stone walls and houses built on the site obliterating its outlines. Fisherman's ko'a formerly on beach has been washed away," according to informant Kepuhi Keahi of Honolua (Ibid. p. 120). Site 18 is called Honuaula *heiau*, and was located in Honolua Gulch just east of a bend in the road. It is described as "Remains of old stone platforms and walls. Measures 29 ft. on south, 46 on west, 20 on north, 54 on east. North wall 3 ft. thick. Whole interior formerly paved with stone, now largely removed to build pens." (Ibid., p. 121).

Honolua Valley

Subsequent research (Moore, 1974) indicates that Site 18 was destroyed and was not Honua'ula *heiau*. Honua'ula *heiau* is Site 1471, a complex series of walls, platforms, and enclosures, and is in excellent shape. It is located east of the highway beyond Honolua Stream Bridge.

This archaeological survey covered some 90 acres[8], including the floor, walls, and embayment arms of Honolua Valley. Thirteen archaeological sites were located, described and mapped (Refer to Map 6). Findings included probable location of Walker's Site 17 (Puhalakau *Heiau*-Site 17), Honua'ula *Heiau* (Site 1471), a series of basalt boulders used as grinding surfaces (Site 1751), an historic structure associated with *kuleana* LCA 4243D, *apana* 2[9] (Site 1752), a possible stratified midden (Site 1753),

[8] Including a portion of TMK: 4-2-04: 32—Refer to Tax Map—Map 2 of this report.
[9] To Makaole for sweet potato cultivation.

historic structures associated with Honolua Ranch Complex (Site 1754), a house platform/burial complex (Site 1755), an agricultural complex (Site 1756), a walled enclosure (Site 1757), an historic house with associated burials (Site 1758), a wall segment (Site 1759), skeletal remains possibly associated with LCA 3803:1[10] (Site 1760), and a midden scatter (Site 1761).[Ibid.]

Mitigation recommendations included data recovery for Site 17, preservation for Sites 1471 and 1751, appropriate treatment of burials located in Site 1752, data recovery at Site 1753, incorporation of Honolua Ranch Complex into plans and preserve grinding stone (Site 1754), and preservation of Site 1755 through 1758. Site 1759 wall is considered no longer significant. The exposed midden (Site 1761) should be excavated, and Site 1760 skeletal remains should be disinterred and reinterred elsewhere (Ibid.).

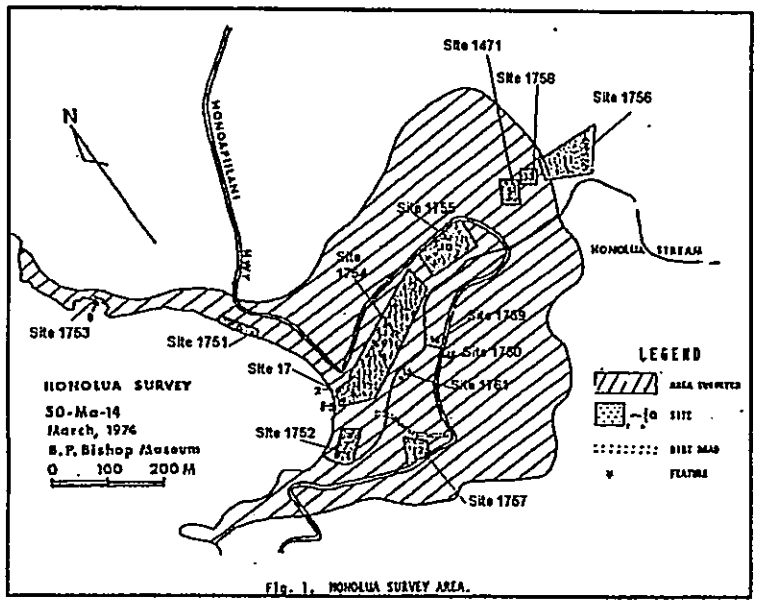


Fig. 1, HONOLUA SURVEY AREA.

Map 6 – Map showing sites found in 1974 archaeological survey by Bishop Museum (adapted from Moore, 1974, p. 2).

[10] To Lalahua for *kula* and houselot.

Maui Land and Pineapple Company Development

This area of development is part of the Honokahua Historic District (Site 50-50-01-1591). This Historic District, as described in the 1973 State Inventory of Historic Places, includes the plantation village, the cannery facilities of Baldwin Packers, Honolua Ranch Stables, Honolua Ditch, the Maui Pineapple Office, the Honolua Store, plantation camp housing and two churches (Wright, 1974, short form data sheet). In a 1973 survey for Maui Land and Pineapple Company, in connection with the Honolua Development, the Bishop Museum's Department of Anthropology did work at Fleming Beach (at Kapalua), to the northeast of the subject parcel (Kirch, 1973). Kirch also worked at Fleming Beach Park at Honokahua Bay, and at Hawea Point Oneloa Bay and Makaluapuna Point. A site-complex made up of 8 features (Site 1346) was identified at Hawea Point, and was interpreted as a temporary Hawaiian settlement for marine exploitation and dated from c. AD 1500. Another site (Site 1347) was a cave shelter on the cliff face of Hawea Point, while a third, Site 1348 was identified as a stone terrace platform, and was located on a promontory overlooking Oneloa Bay. During this survey the Honokahua Burial Site (Site 1342) was first identified. Several sites were located and described, including a house site, terrace, enclosure and midden deposits, along the south band of Honokahua Stream on the east side of Fleming Beach Park (Site 1345) [Kirch, 1973].

Numbers of archaeological projects have been undertaken and completed in the general Kapalua Resort complex in the intervening years. Archaeological research for Kapalua Hotel Development, Parcel 2-H was divided into three phases of investigation—reconnaissance survey, intensive survey and testing, and data recovery/mitigation excavations. In early 1986, initial clearing for access roads exposed disturbed human skeletal material. The pedestrian survey pinpointed 6 areas where human remains were present, expanding the boundaries of the Honokahua Burial area, and calling for a more detailed intensive survey to be conducted (Haun and Rosendahl, 1986).

This intensive survey was conducted, and included both surface and systematic soil coring and test excavations. A total of 8 sites were identified, including Honokahua Burial Site (site 1342). The probable boundaries for this burial site were defined, and areas of probability for burial recovery were formulated. Other prehistoric sites reported included segments of a prehistoric trail (Site 2015), and a subsurface cultural deposit (Site 2016). Three historic sites were associated with ranching—Honolua Ranch Stables, a concrete water trough and an enclosure (BPBM D12-15). Two other sites—a walled shelter near a trail and a recent hearth, and a rubble pile, were of indeterminate age (Donham, 1986).

Beginning in March of 1987, the data recovery and mitigation excavations began and continued until December 1988, when fieldwork was halted, due to external pressure. The interim results of the fieldwork were presented in an informational report describing the Honokahua Burial area as a multi-component burial site with over 1000 prehistoric burials. The site appears to have been used from as early as AD 600, according to radiocarbon analysis (Donham, 1989). The final report on archaeological findings has been reviewed and accepted. Archaeological work associated with the development of the

Kapalua/Ritz-Carlton Resort complex by PHRI resulted in over 24 reports between 1986 and 1992.

After secession of excavation at the Honokahua Burial site, the Ritz-Carlton Hotel site was moved inland to a less culturally sensitive area. The archaeological monitoring strategy for the new Ritz-Carlton Hotel site included additional research in areas contiguous to the Honokahua burial grounds. This project work was divided into 3 areas (Guerriero, et. al., April 1993, p. 31). Area I contained 5 sites (Sites 2869, 2870, 2971, 2874 and 2875). One site was identified in Area II—Site 2872; in Area III—three sites were located (Sites 1342A, 2873 and 2876).

Site 2869 consists of 2 historic subsurface cultural deposits, and one historic feature containing 694 historic artifacts primarily of Japanese origin. The other feature also contained historic materials, although considerably fewer in number. These deposits probably represent a refuse dump for the nearby Japanese Plantation Camp (Ibid., p. 34). Site 2870 is part of another refuse dump, including structural remnants related to Honolua School and its outbuildings. Site 2871 consists of features (dwellings, tennis court, grandstands, Quonset hut, potting area) associated with late-plantation-era mid-management personnel activity during the 1940s through the 1960s (Ibid., p. 36). Site 2872 consists of historic stone-faced terracing and retaining walls. Site 2872 is composed of 6 features, a communal outhouse, a stone pile placed on corrugated roofing, 2 pits containing non-indigenous material and shell midden, and 2 bowl-shaped fire pits (*imu*). All features are considered modern. Site 2875 is a concrete foundation floor, perhaps a relic of plantation life in the early to mid-20th century (Ibid., pp. 38-41).

In Area III, 3 sites were identified. Site 1342A consists of 10 prehistoric human burials peripheral to the central burial ground. Site 2873 consists of precontact cultural deposits and fire pits indicative of prehistoric habitation, and Site 2876, which is a prehistoric trail remnant (Ibid., pp. 41-49). In Site 1342A, BU-2 was located 1.7-1.8 m. below surface and produced two datable radiocarbon samples. One ranged from AD 1703-1918, and another, recovered from a deeper level yielded a date range from AD 1270-1650. A third radiocarbon date of AD 1670-1950 was recovered from BU-7 (Ibid.).

Although two dates could be within the post-contact period, the method of burial (flexed) is precontact in configuration. Site 2873 consists of a series of *imu*. Charcoal from 3 of these fire pits dated the utilization of the area between AD 1423-1680 (Ibid., pp. 58-60). Such features are ordinarily associated with habitation, but no clear habitation sites were found in Area III.[11]

Site 2876 is a trail segment located among the burials and is probably a segment of the prehistoric trail mentioned earlier—Site 2015. It consists of 2 parallel alignments of large angular and subangular basalt bounders, stacked roughly in 2 courses. The interior is paved with angular basalt and small cobbles, with some scattered waterworn coral fragments present as well (Guerriero, et. al., 1993, p. 60).

[11] At Fleming Beach Park located west of the archaeological sites just discussed, where Honokahua Stream enters the ocean, Kirch found habitation indicators such as midden deposits (Kirch, 1973). Site 2873 may be associated with that complex.

In May of 1994, Xamanek Researches conducted an archaeological inventory survey on a 12.1-acre area referred to as the Kapalua Bay Hotel and The Bay Club grounds, which lies northeast of the project area. A series of 28 subsurface backhoe tests were excavated. While no historic sites were located during our survey, an area of sand dune deposits was noted at the northern end of the project parcel. It was impossible to test the area at the time, because of underground sprinkler systems and electrical conduits. The recommendation was to survey this portion in the event that the area was to be developed in the future (Fredericksen, et. al., September 1994).

In May of 1996, Xamanek Researches returned to examine the previously untested dune areas. As an addendum to the original inventory survey, the findings, which were negative, were reported in September 1996 (Fredericksen, et.al.). However, archaeological monitoring was recommended during any future earthmoving activities in the dune area (Zone B).

Kapalua Land Company, Ltd. began development of this parcel in 2000, and retained Xamanek Researches to carry out the required monitoring program. During the course of the project 3 previously unidentified sites were located. These consisted of Site 4814—a post-contact crypt burial; Site 4815—a precontact subsurface habitation layer and Site 5059—previously disturbed human remains (Fredericksen, March 2001). Site 4815 yielded a radiocarbon age of 290 +/- 40 BP, and a calibrated date range of AD1490 to 1665. The intercept of the radiocarbon age with the calibration curve fell at AD 1640.

In June through July of 1997, Cultural Surveys Hawaii, Inc. undertook an inventory survey of c. 450 acres, identified as Project District 2, and located on the *mauka* side of Honoapiilani Highway, south of the present project area (Devereux, Folk and Hammatt, Draft February, 1998). Eight sites were identified—seven of which had been previously unrecorded. They consist of walls, boulder terraces and a boulder pavement, an overhang shelter cave, an historic reservoir, a road bridge, and a cemetery. The eighth is Site 1591, the Honokahua Historic District. None appeared to be precontact.

In November of 1997, Xamanek Researches conducted a reconnaissance survey for the proposed 11-acre Spa Resort Project at Kapalua. This parcel is bordered on the south by Honoapiilani Highway, on the west by the Pineapple Hill Subdivision, on the north by Simpson Way and on the east by Office Road (Fredericksen, November 17, 1997). The now-closed Pineapple Hill Restaurant is located in the center of the parcel. The building was built in 1915, and was the home of D. T. Fleming, manager of Honolua Plantation. The survey did not locate any significant material remains, except for the aforementioned building. Since the building has been severely damaged by termite activity, it was recommended that photo documentation of the structure be done, if the owner decided to demolish the building. While no other archaeological work was deemed necessary, on-call monitoring was recommended, in the event that any significant material cultural remains are encountered during construction activities.

The 475-acre *mauka* portion of the Kapalua District 2 project area was surveyed during the summer of 2001. A total of 37 sites were located in 2 *ahupua'a*—Napili 2-3, and Honokahua (Sites 50-50-01-5127 through 5163). They are located in the drainage systems between the flat areas of pineapple cultivation. They consist of temporary habitation rock shelters, small agricultural complexes, ceremonial complexes, possible burials, and ranch and plantation-era sites. Four radiocarbon dates ranged from mid-fifteenth century to more recent times; one returned a modern date; and one rock shelter dated to the late precontact to early post-contact period (Fredericksen and Fredericksen, September 2001).

Fleming Beach Park

Fleming Beach Park lies to the southwest of the present project area, and is a popular recreation park, maintained by the County of Maui. In February and March of 1994, Xamanek Researches undertook subsurface testing in the areas of the park destined for renovation work (Fredericksen, et. al., May 1994). Renovation plans called for the construction of a restroom facility on a sand dune area, and a connecting walkway path from the existing parking. A total of 10 manual 1.0 x 2.0 meter test units were excavated, and ranged in depth from 1.2 to 2.2 meters in depth. Additionally, 109 auger tests were placed at 2 meter intervals over the area, and ranged from 0.3 to 1.2 meters in depth. The manual testing was required as part of an agreement between the County of Maui Recreation Department, the Maui and Lana'i Islands Burial Council, and the State Historic Preservation Division. The testing was designed to assure a "buffer" zone of at least 1 meter between surface construction and possible cultural material and/or human remains that might lie below that depth.

At sometime in the past, in an effort to stabilize the sand dune, a cap of reddish brown clay had been placed on the loose sand. It ranges in thickness from 0.4 to 1.0 meter in tested locations. It most likely was obtained from the streambed to the south. No indigenous cultural material was found *in situ*. However, one test unit contained some indigenous artifacts and shell midden, mixed with modern historic material. It appeared that this area of the park had been filled in the relatively recent past. It is not known from where the fill material originated. Finally, there were no human remains located in the tested areas (Fredericksen, et. al., May 1994).

On August 29, 1995, human remains were uncovered while workers were digging a sewer line. Xamanek Researches investigated and found the remains to be part of an *in situ* burial, contained within a basin-shaped pit. Given that the individual was buried in a flexed position, it was determined that the remains were that of a Native Hawaiian, probably peripheral to the Site 1342A burial complex on the adjacent property (Fredericksen, et. al., February 1996, p. 4). Mitigation of this burial included sifting the disturbed sands to recover displaced skeletal remains, construction of a concrete enclosure and cement cap, and refilling the excavation.

Other archaeological studies

An archaeological inventory survey was conducted by PHRI in 1995 on a 2.47-acre coastal parcel (4-2-4: 31) that lies in the midst of the present study area on Alaelae

Point. Five sites consisting of six components were identified during the survey. They included a fire pit (Site 4141), terrace (Site 4142), platform (Site 4143), modified outcrop (Site 4144), and boundary wall (Site 4145). A radiocarbon age of 210 +/- 50 BP, with calibrated cylindrical ranges of AD 1528-1555, 1633-1704, 1720-1820, and 1916-1954, was obtained from Site 4144 (Jimenez and Rosendahl, October 1995).

In the latter portion of 1999, a survey of the Honoapi'ilani Highway corridor was undertaken by Xamanek Researches. The corridor extended c. 1.7 km. from Alaelae Point to Honolua Bay. One site—50-50-01-4829—was identified. It consisted of two dry-laid rock retaining wall sections that support Honoapi'ilani Highway across an unnamed drainage area near Mokuleia Bay (Fredericksen and Fredericksen, March 2000).

Settlement Patterns and Expectation of Findings

The precontact *ahupua'a* settlement pattern in this region of Maui includes permanent and temporary habitation sites located along the coastal regions, and in the inland valleys, which included extensive *lo'i* systems. While the population of Honokahua in the 1830s was not estimated to be great[12], the precontact population was likely considerably larger. The extensive burial ground at Honokahua to the south of the present project area also suggests a sizable precontact population.

The kinds of sites that might be expected along the coast associated with habitation would be stone structures such as enclosures, midden deposits, and burial areas. It is also possible that part of the precontact encircling trail—Alaloa—Sites 2015, and 2876, that were identified near the Honokahua Burial Site in 1986 and 1993, may have crossed the coastal area of the *ahupua'a* of Honolua as well.[13] In the valleys, sites such as stone walls, enclosures, pond fields and irrigation ditches associated with taro production might be expected. Temporary habitation sites could be identified by walled enclosures, fire and refuse pits, etc. They could also take the form of rock shelters, both in valleys and along the rocky coasts, wherever such geological features were present. Two heiau are known to have existed—one on the *makai* side of the road, and one *mauka* in Honolua valley.

As far as the inland area between valleys is concerned, this region has been under pineapple cultivation for decades. Prior to that, cattle grazing occurred. Today, modern golf courses exist in some areas. These areas were no doubt utilized in precontact times for the gathering of forest products from temporary camps or habitation sites, and perhaps for some dry land cultivation with similar temporary habitation areas. However, it would not be expected to find remaining evidence of this activity as a result of the more recent usage.

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[12] Refer to page 3 of this report.

[13] In other areas of Maui the historic government (*aupuni*) road followed the *Alaloa* trail, which was built about 1516 by Kihapi'ilani after his conquest of the whole island. This trail "was paved with stones along much of its extent, hence it was referred to as the '*kipapa* (pavement) of Kihapi'ilani'. (Fleming, 1933, p. 7—in Handy and Handy, 1972, p. 489).

Site expectations in project area

The kinds of precontact sites that might be expected along the coastal headlands covered by this inventory survey might be temporary camps or habitation areas associated with dry land cultivation, fish spotting sites, and possibly remnants of the 17th century trail that once encircled the island. Concentrations of human burials would not be expected, since the pattern in this region reveals that burials seem to be concentrated in the coastal sand dune/beach areas. However, in some of the headland geological features, the occasional rock shelter may exist, which could contain human burials. Such was the case with Site 1347, located on the cliff face at Hawea Point, which was recorded by Kirch (1973).

The kinds of post-contact sites that might be present would be features associated with ranching activities such as refuse dumps, rock walls and animal pens. Also features associated with road building, as with Site 4829, may occur on the *makai* side of Honoapi'ilani Highway.

ARCHAEOLOGICAL METHODS

The c. 23-acre project area was surveyed during March and April 2001. Field personnel included Mark Donham, Daniel Vicars and Hugh Coflin, while Erik Fredericksen acted as the principle investigator for the overall project. Walter and Demaris Fredericksen were the senior advisors for this inventory survey, and the latter provided background research and worked on the overall production and editing of this report.

The inventory survey was carried out in two phases. The first phase consisted of a surface walkover that located six previously unidentified archaeological sites. In general, this narrow, irregularly shaped project area was visually inspected with c. 5-meter transect intervals. Transect lines were generally oriented parallel with Honoapi'ilani Highway. Sea cliff areas—particularly in the vicinity of Mokuleia Bay and Kalaepiha Point—were inspected from the shoreline and transected where safety conditions allowed.

The second phase of the inventory survey consisted of evaluation of the six previously unrecorded sites and two previously identified (but unrecorded sites). Field mapping was carried out with handheld compasses and metric survey tapes. Test units were excavated at four of the eight sites. These test units were excavated by stratigraphic

layers and 10-cm artificial levels were used in layers that exceeded 10 cm in thickness. Excavated soil was screened through 1/8th inch hardware cloth. All material culture remains recovered from the screening process were collected for subsequent laboratory analysis by Xamanek Researches. Standard laboratory procedures were used in this process. Two charcoal samples were collected in the field and placed in aluminum foil. One sample was submitted to Beta Analytic, Inc. in Florida for subsequent radiometric analysis. No other material culture remains were transported off-island. Written, descriptive notes were kept in the field and photographs were taken with color film.

ARCHAEOLOGICAL FIELD RESULTS

A total of six previously unrecorded archaeological sites were located during our inventory survey. These include a paved enclosure with an associated access trail and probable fish-spotting station (Site 5093), a remnant of a possible habitation area (Site 5094), a remnant of the Old Government Road (Site 5095), an old concrete slab associated with a former slaughter house (Site 5096), two coastal rock overhang shelters (Site 5097), and an *in situ* coastal burial (Site 5098). In addition, more information was gathered on two previously identified sites—a plantation-era refuse dump (Site 5006), and a small coastal enclosure (Site 5007). Each of these sites is discussed below. Refer to Map 3 for general site locations within the *makai* project area.

Previously unidentified Sites 5093-5098

These six sites were located during the current project and lie northeast of Sites 5006 and 5007. Each of these sites is discussed below.

Site 5093 on Kalaepiha Point (Figures 2-7, Photos 3-8)

This northeasterly most site lies on Kalaepiha Point. This point of land borders the southwestern portion of Honolua Bay and has a commanding view of the coast to the northeast and southwest (Photo 3). This portion of the project area drops off sharply to the northeast an estimated 30 meters (100 ft) to Honolua Bay below. Site 5093 (Figure 2) consists of a paved platform/enclosure and a possible fish spotting station. Alien vegetation noted in the vicinity of this site included *koa haole*, alien grasses and annual weeds, and a few small ironwood saplings (Photo 4). Surface visibility tended to be fair

to good in the general area. Site 5093 is in generally fair condition. A cleared area associated with the former slaughterhouse (Site 5096) lies to the southwest. This area appears to have been relatively recently bulldozed as well. Site 5093 consists of two components—a platform/enclosure (Feature A) and an access trail to the possible fish spotting station (Feature B).

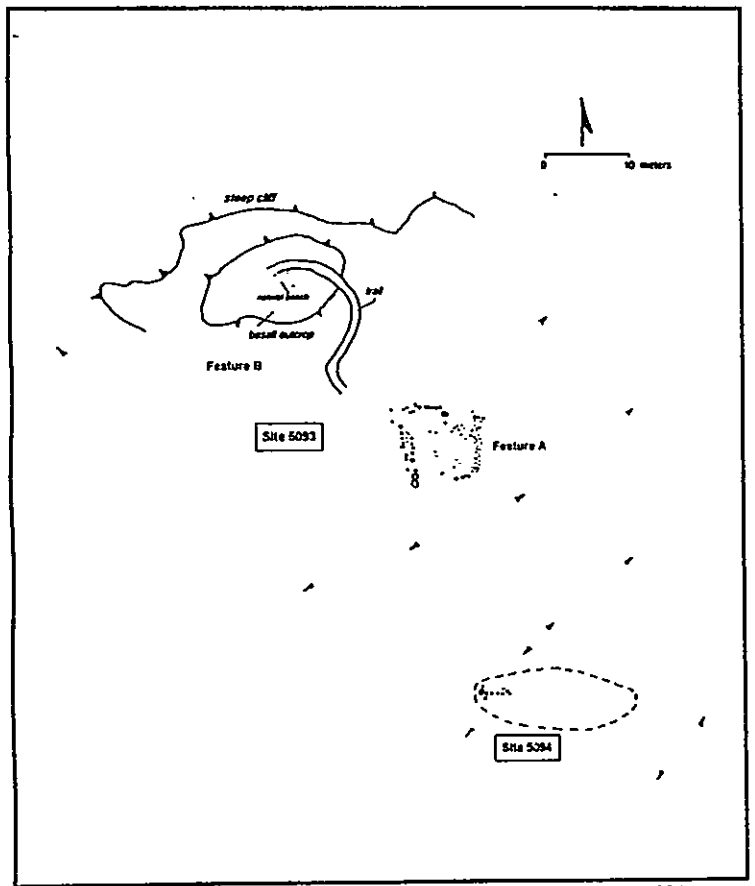


Figure 2 – Plan view—showing the relationship between Sites 5093 and 5094.

Feature A

This semi-rectangular platform/enclosure is located on a knoll that overlooks Honolua Bay. Feature A (Figure 3) appears to have been impacted by previous vegetation clearing activities possibly associated with the ranching era and/or the more recent slaughterhouse demolition. The intact portion of Feature A measures c. 11-meters N/S by 10 meters E/W by a maximum height of 45 cm. The remains of a core-filled wall are visible along the western portion of the enclosure (Photo 5), while remnant alignments are present along the other sides of the structure. Several water worn basalt pebbles and pieces of coral are exposed in portions of the interior. Subsequent investigation revealed that the interior is paved with this water worn material. It appears very possible that the sides of this paved structure were formerly higher. It is interesting to note that only relatively young *koa haole* saplings are located on the knoll, indicating that the area has likely been cleared of vegetation within the last 10-15 years. Scattered modern refuse was noted on the surface in the general vicinity of this enclosure. Four test units were utilized to investigate subsurface conditions at Feature A.

Test Unit 1

This 1-meter square unit was placed in a previously disturbed area of the northwestern portion of the structure (Figure 4). Test Unit 1 was utilized to assess whether or not there was any subsurface remnant of Feature A. This shallow unit was a maximum of 25 cm deep and terminated at weathered bedrock. The brown (7.5 YR 5/3) silty loam (Layer I) present in TU 1 did not contain any material culture remains. There was no remnant of the structure wall or the pavement encountered in this test instance.

Test Unit 2

Test Unit 2 was excavated in the interior of Feature A to verify the presence of what appeared to be a water worn pavement. Unit dimensions were 1.0 meter by 1.0 meter by 40 cm. in depth and orientation was to the NW. Two soil strata and a water worn pavement were encountered in TU 2 (Figure 5).

Layer I (0-22 cmbs) consisted of loose, brown (7.5 YR 5/3) silty loam. This stratum was up to 20 cm. thick and contained 5-10% by volume subangular pebbles and cobbles. A water worn pavement consisting of water worn *'ili 'ili* and coral was encountered at c. 5 cmbs and was up to 15 cm thick in this location (Photo 6). Recovered material culture remains from Layer I included 13.1 g. of marine shellfish, 1.4 g. of dog teeth fragments, 2.1 g. of fish bone, 2.0 g. of mammal (non-human) bone, 8.0 g. of scattered charcoal[14], and three indigenous artifacts. These artifacts included two utilized basalt flakes (Art. # 1-2), and a *puka* shell ornament (Art. #3). Artifact #1 measures 62.0 x 48.5 x 12.0 mm., and weighs 31.8 g. Artifact #2 measures 27.0 x 9.0 x 3.0 mm. and weighs 0.7 g. The *puka* shell ornament is 10 mm. in diameter x 9.0 mm. in thickness and weighs 0.4 g.

Layer II (c. 21-40 cmbs) was composed of light brown (10 YR 6/4) clay loam.

[14] This charcoal was recovered from the upper 5 cm of the unit and was not submitted for analysis.

This dry, compact stratum contained less than 5% by volume subangular cobbles and pebbles. Weathered bedrock pieces increased with depth and TU 2 was halted at 40 cmbs at more intact weathered bedrock. No cultural materials were found in this layer.

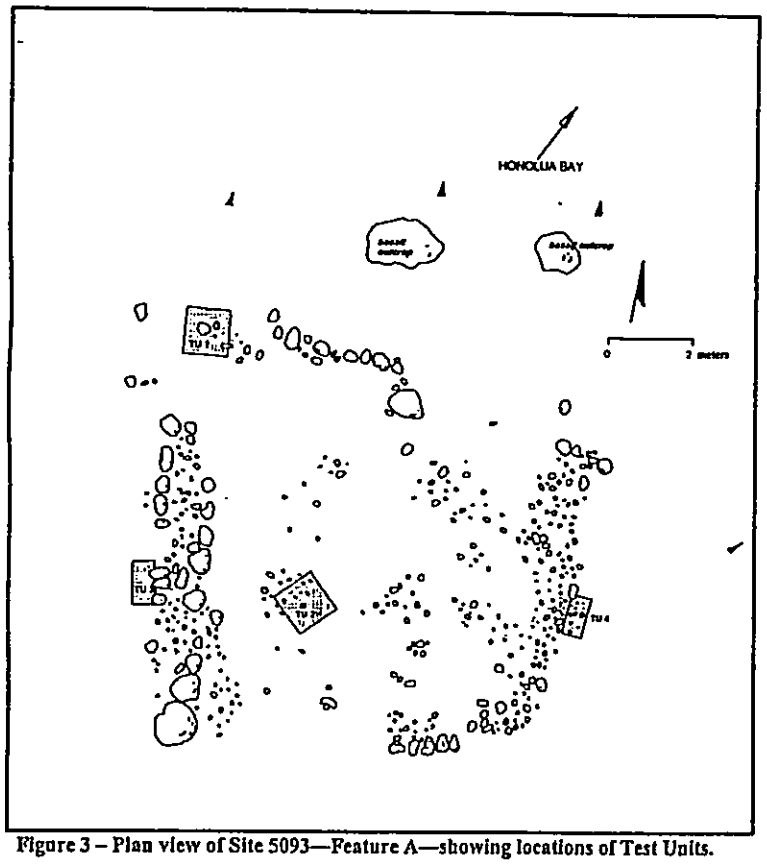


Figure 3 – Plan view of Site 5093—Feature A—showing locations of Test Units.

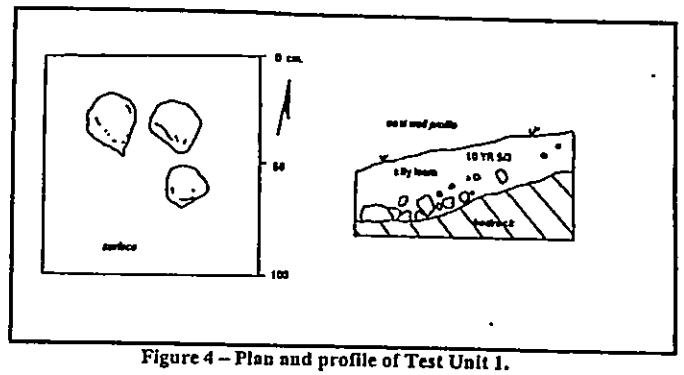


Figure 4 – Plan and profile of Test Unit 1.

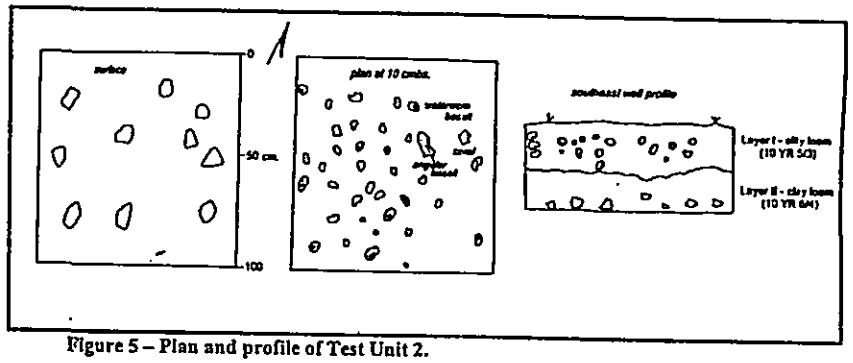


Figure 5 – Plan and profile of Test Unit 2.

Test Units 3 and 4

Both of these units were used to investigate conditions adjacent to the exterior western and eastern edges of Feature A. Both units were 0.5 meter wide by 1.0 meter long and c. 40 cm deep. No evidence of the Feature A pavement was encountered in either of these units. In addition, no significant material culture remains were found in either unit. Layer I (0-23 cmbs) was composed of the common brown (7.5 YR 5/3) silty

loam. Layer II consisted of light brown clay loam and weathered bedrock. Excavation was halted at 40 cmbs due to increasingly dense, weathered bedrock.

Remnants of the Feature A wall were located in the ENE profile of TU 3 and in the west wall of TU 4. The visible, intact portions of the structure did not extend into Layer II in either test instance (Figures 6-7).

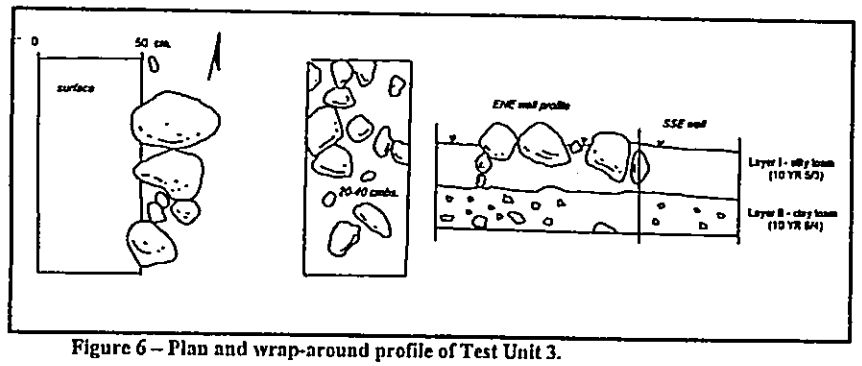


Figure 6 – Plan and wrap-around profile of Test Unit 3.

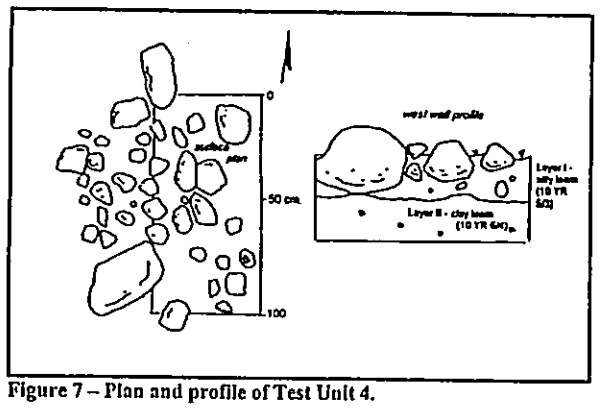


Figure 7 – Plan and profile of Test Unit 4.

Feature B

This feature consists of an unpaved trail that extends from near the northwestern portion of Feature A to what is an excellent vantage point that overlooks Mokuleia Bay to the southwest, and Honolua Bay to the northeast (Figure 2).[15] Oral history information

[15] This portion of Kalaepiha Point may be the area near Honolua Bay that was referred to by Mr. Clement Kamaka (Jimenez and Rosendahl, 1995) in the historic background section of this report.

supplied by Mr. William Waiohu of the *Maui/Lana'i Islands Burial Council*, and Mr. Aimoku Pali of Honokohau Valley indicates that this portion of Kalaepiha Point was utilized in relatively recent historic times as a fish-potting station. No modification of the vantage point or the trail was noted during several inspections of the area.[16]

Discussion

Inventory level work conducted at Site 5093 revealed a paved platform/enclosure—Feature A, and a possible fish spotting station—Feature B. While portions of Feature A appear to have been impacted by previous land clearing activities, this platform/enclosure is in generally fair condition. The source area for the water worn pebble and coral pavement is likely Honolua Bay beach area some 200 meters (650 ft) to the ESE of this site. This relative distant source area indicates that a substantial amount of labor was expended in order to pave Feature A. The labor expenditure necessary to construct the c. 110-meter square platform/enclosure and pavement on the most prominent flat portion of Kalaepiha Point suggests that Feature A might have had a ceremonial function associated with fishing activities. The proximity of Feature B—a probable fish spotting station—further suggests a traditional ceremonial function for this site. Site 5093 is interpreted as a precontact site, portions of which (Feature B) continued to be used into modern times. Oral information provided by Mr. William Waiohu and Mr. Aimoku Pali indicated that this area was considered to be an important fish spotting area in their lifetimes.

Site 5094 (Figures 2, 8-9)

This site remnant lies c. 29 meters southeast of Site 5093 on the slope of the knoll at c. 80-85 ft. AMSL. Site 5094 is composed of a short alignment/terrace remnant and a very low-density surface scatter. Relatively recent bulldozing activities have impacted this site and the area surrounding it. In addition a relatively recent backhoe trench scar was observed in the immediate vicinity. Vegetation observed in this sloping (c. 15%) area included *koa haole* saplings, alien grasses, and annual weeds (Photo 4). Weathered bedrock is visible along portions of the slope in and above the site. Scattered modern refuse was noted on the surface in the vicinity of this site remnant.

Site 5094 is in poor condition. The overall dimensions of this site are c. 18 meters E/W by 7 meters N/S (Figure 8). The low-density surface scatter consists of a few pieces of marine shellfish remains, water worn pebbles and coral. One indigenous artifact, a large basalt grinding stone (Art. #5) was recovered from the previously disturbed surface (Photo 1). This large, vesicular basalt rock measures 450 mm. in length by 250 mm. in width by 240 mm. in thickness, and weighs 31.75 kg. It exhibits use wear on three

[16] Erik Fredericksen visited Feature B on separate occasions with Mr. William Waiohu of the Maui Lana'i Islands Burial Council, and Mr. Leslie Kuloloio of Na Kupuna o Hawai'i. While both men were previously unaware of the existence of the Feature A platform/enclosure, they each strongly felt that it had a ceremonial function, based on its location. In addition, both men recalled having heard from *Kupuna* that the Kalaepiha Point area was an important fish spotting area.

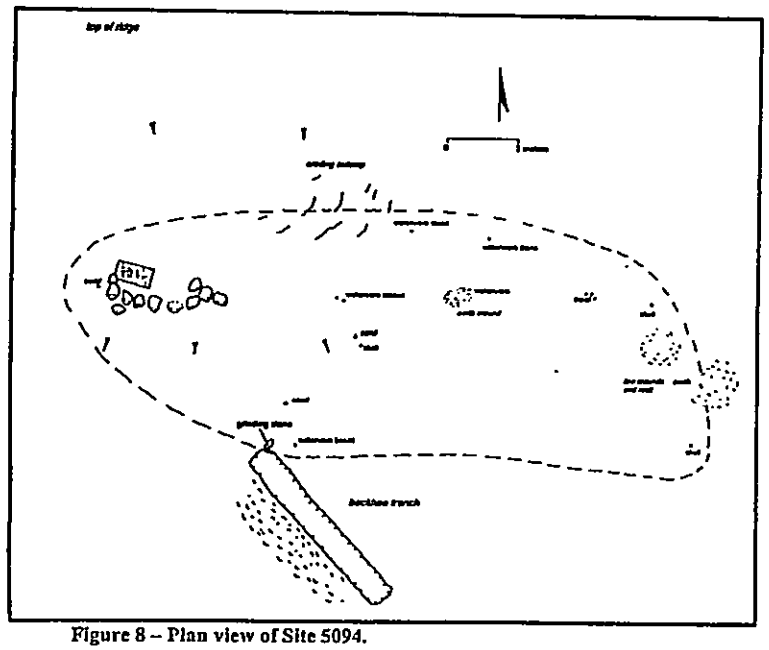


Figure 8 – Plan view of Site 5094.

sides. The single course alignment—Feature A—measures c. 3.25 meters E/W by 0.75 meter wide by a maximum of 0.40 meter high. Three low soil and rock piles (maximum of 40 cm. high) are located on the eastern side of the surface scatter. The backhoe trench mentioned above lies just south of the limits of the surface scatter. One test unit was utilized to investigate subsurface conditions at this site.

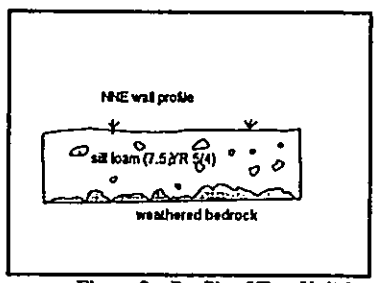


Figure 9 – Profile of Test Unit 1.

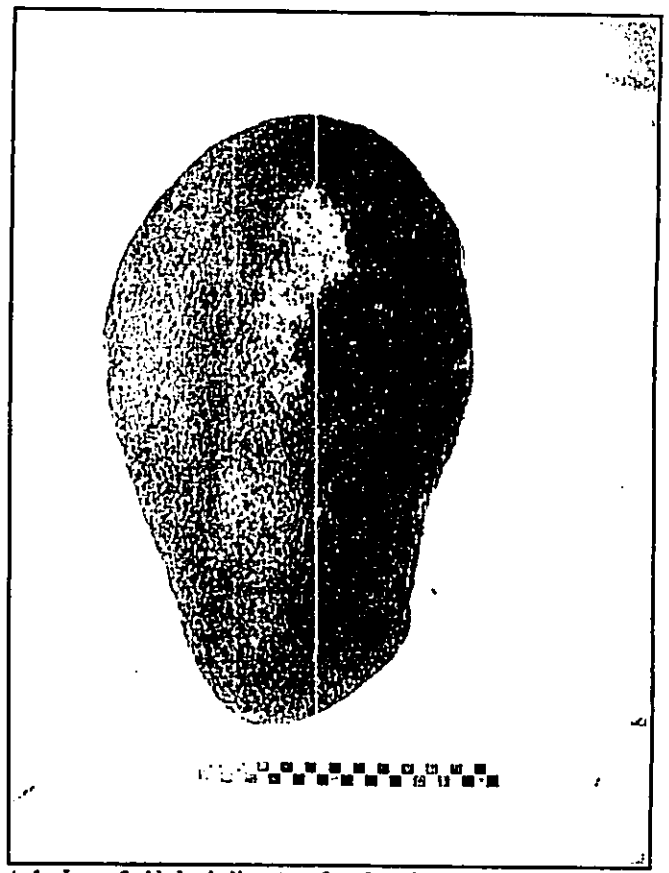


Photo 1 – Large 3-sided grinding stone found on the surface (Artifact #5).

Test Unit 1

This unit was placed just upslope (north) of the alignment to assess subsurface conditions. The unit was oriented NW-SE and measured 1.0 meter by 0.5 meter. One soil layer was encountered before TU 1 was halted at weathered bedrock at c. 18-20 cmbs (Figure 9).

Layer I was up to 20 cm. thick in this test location. This loose, rocky stratum consisted of brown (7.5 5/4) silty loam. This stratum contained 50-75% by volume weathered bedrock pieces and yielded 1.1 g of *kukui* nut and two waterworn pebbles.

Discussion

Site 5094 has been impacted by previous land clearing activities. While the age of this site remains somewhat unclear, it appears probable that it is a precontact rather than a post-contact historic property. Its function remains somewhat unclear, given the previous disturbance. However, based on the presence of scattered shellfish remains and the grind stone artifact, Site 5094 is tentatively interpreted as a possible habitation area remnant.

TABLE 2

Summary of Subsurface Results for Sites 5093 and 5094

	Site 5093 Test Unit 2	Site 5094	Site 5094 Test Unit 1
	Layer I 0-20 cmbs	surface	Layer I 0-28 cmbs
GASTROPODA			
Cellana sp.			
Conus sp.	0.4		
Cypraea sp.	12.4		
Thaididae sp.			
BIVALVIA			
Isognomon sp.	0.3		
BONE			
Teeth, mammal	1.4 (dog)		
Fish	2.1		
Unidentified	2.0		
FLORAL			
Charcoal	8.0		
UNWORKED CORAL (pieces)	(2) 1.2		(1) 1.1
WATERWORN PEBBLES (pieces)	(1) 4.3		(2) 7.3
ARTIFACTS			
Utilized basalt flake	#1-2		
Grindstone		#5	
Puka shell	#3		

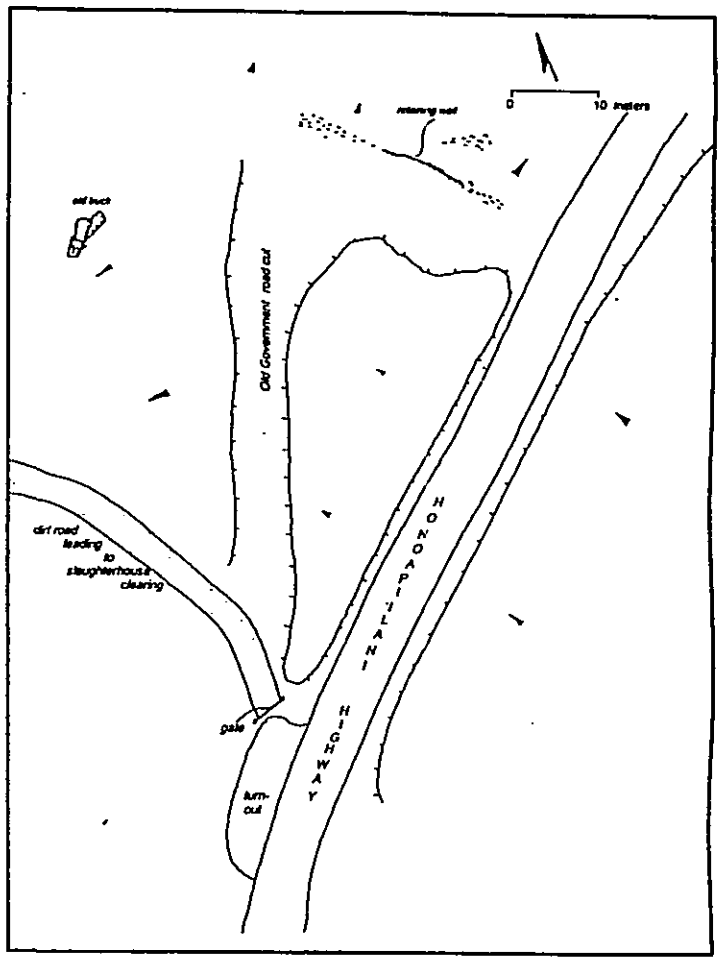


Figure 10 – Plan view of Site 5095.

Site 5095 (Figure 10: Photo 9)

This site consists of a remnant of the Old Government Road and an associated retaining wall that crosses a portion of the project area.[17] This site is paralleled by Honoapi'ilani Highway on its eastern side. Site 5094 is truncated by a dirt access roadway that is probably associated with the former slaughterhouse (Site 5096) on its southwestern side, and by the new highway on its northeastern side. Vegetation present in this area consists of *koa haole* saplings, alien grasses, and annual weeds. Estimated elevations for this portion of the project area are 75-80 ft. AMSL. Site 5095 is in generally fair condition.

The visible remnants of this site include the old road cut and a dry laid retaining wall. The intact portion of the road cut extends some 60 meters NNE/SSW by 35 meters WNW/ESE and measures c. 7.5 meters in width. The intact portion of the retaining wall is c. 12 meters NW/SE and is up to 75 cm. high. It is fairly well-constructed from subangular basalt, but is in generally poor condition (Photo 9). No excavation was undertaken at this post-contact site.

Discussion

This portion of the Old Government Road is the only recognizable remnant of this late 1800's roadway encountered in the project area.

Site 5096 (Figure 11; Photos 10, 15-16)

This site remnant consists of the concrete foundation of the former slaughterhouse that was located on Kalaepiha Point. The former building was a landmark and the area—particularly the beach to the southwest—was generally known as "slaughterhouse" in the past. The nearby beach is to some extent still referred to by this name rather than Mokuleia Beach. Site 5096 lies at c. 65-70 ft AMSL in a cleared area. Modern refuse and portions of several abandoned vehicles were observed in the general area. Relatively recent bulldozing activities have extensively disturbed the general area. The concrete slab measures 7.6 meters NW/SE by 4.8 meters NE/SW by 0.4 m. in height (Photo 10).

The northeastern portion of this site has been impacted—possibly from the demolition of the former building. The northwestern portion of the slab slopes downward at approximately 20 degrees into what is interpreted as a blood drainage trough. This portion of the slab appears to be somewhat newer than the rest of the foundation. While it remains unknown, it may be possible that a later lessee of the building added the northwestern part of the foundation.

According to Mr. Wesley Nohara, Manager of Honolua Plantation (Maui Pineapple Company, Ltd.), the slaughterhouse was constructed between about 1915 and

[17] In other areas of Maui the old government road *(aupuni)* followed the Alaloa trail, which was built in c. 1516 by Kihapi'ilani following his conquest of the whole island (Fleming, 1933, p.7—Handy and Handy, 1972, p. 489). The section of the government road in this part of Maui was originally constructed in the late-1800s according to Mr. William Waiohu and was subsequently modified through the mid-1900s.

1920 (personal communication, 2001). It was originally part of Honolua Ranch, which

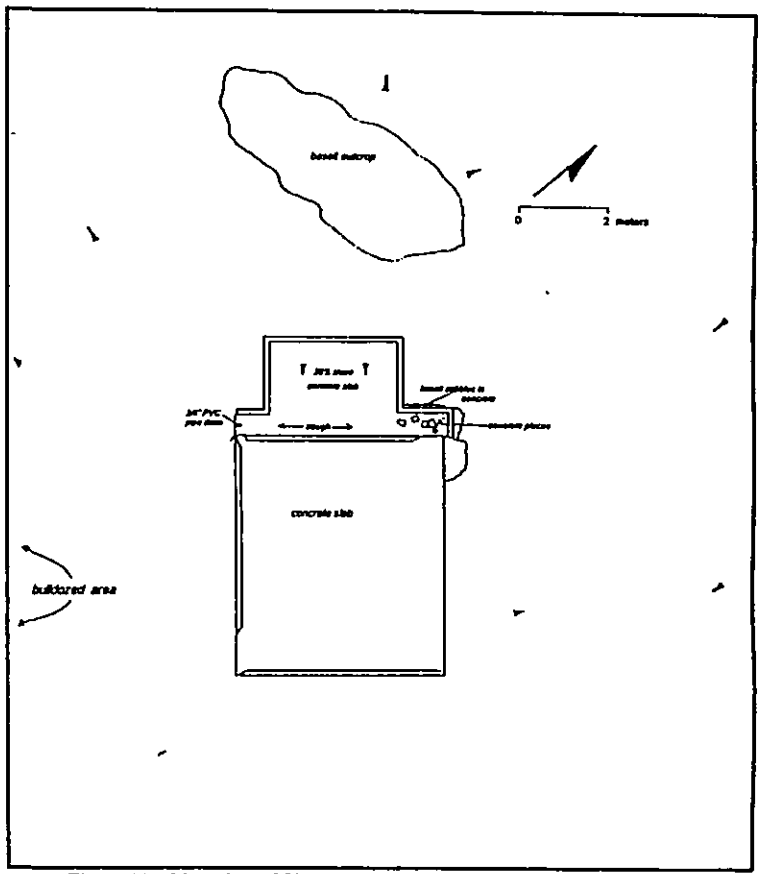


Figure 11 – Plan view of Site 5096—old slaughterhouse foundation.

subsequently became Baldwin Packers in the 1920s. Mr. Nohara indicated that the slaughterhouse was closed in the early 1940s. The area was subsequently leased to company employees who raised pigs on portions of the project area. Both Mr. Nohara and Mr. William Waiohu, MLIBC Member, believe that the building was torn down sometime during the 1940s-1950s. No subsurface work was conducted at this site.

Discussion

The overall integrity of Site 5096 is poor. The existing slab is all that remains of the former building. The surrounding area has been extensively cleared by past bulldozing activities.

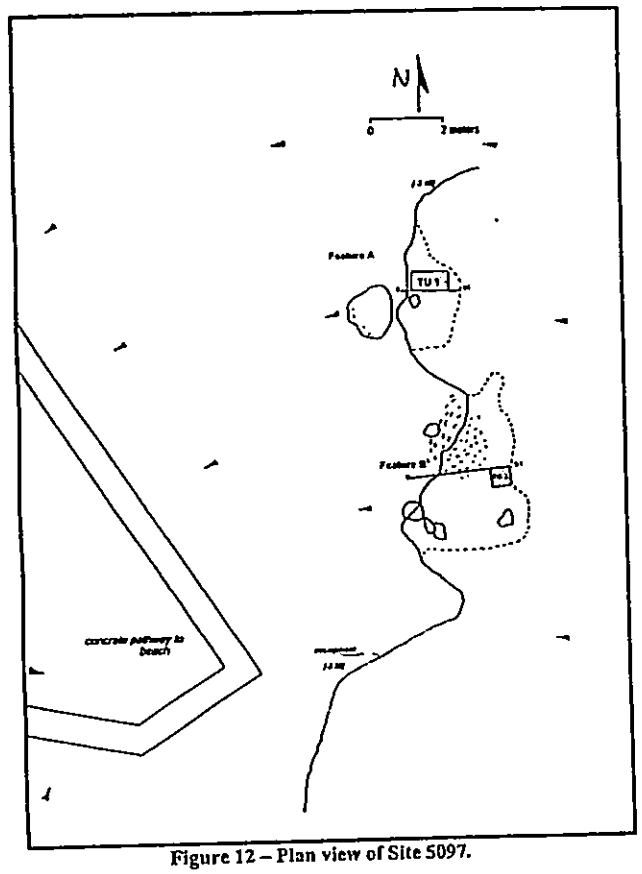


Figure 12 – Plan view of Site 5097.

Site 5097 (Figure 12-14; Photo 11)

This coastal site is located near a concrete beach access walkway to Mokuleia Beach (Slaughterhouse Beach). It consists of 2 rock overhang shelters that lie within c.

35 meters of the beach deposit. These overhangs lie along the eastern side of a gulch at c. 20 to 25 feet AMSL. Vegetation noted in the general area included *kukui* nut and *kiawe* trees, *koa haole* shrubs, alien grasses and annual weeds. Previous bulldozing activities associated with road improvements appear to have impacted the area at the top of the ridge above the site. These overhang features are situated within 5 meters of one another below this disturbed area (Figure 12; Photo 11). Both features underwent subsurface testing.

Feature A (Figure 13)

This overhang is the closest to the ocean of the two shelters. It lies c .9 meters WNW of the concrete access pathway to the beach. The dimensions of the covered portion of this rock shelter are c. 3.5 N/S meters width by 1.75 meters E/W in depth by 1.45 meters in maximum height. No material culture remains were observed on the floor of Feature A. One test unit was utilized to assess subsurface conditions in this location.

Test Unit 1

Test Unit 1 was oriented E/W and measured 1.0 meter E/W by 0.5 meter N/S. The surface of this unit was covered with loose rocks—possibly from minor roof collapse. A total of four strata were encountered before TU 1 was halted at 90 cmbs in sterile soil (Figure).

Layer I (0-10 cmbs) was made up of loose, reddish brown (2.5 YR 5/3) very fine silt. This stratum contained a few scattered subangular pebbles and cobbles. Recovered material culture remains from Layer I included 24.9 g. of marine shellfish, 0.2 g. of sea urchin body parts, 0.2 g. of fish bone, 2.1 g. of *kukui* nut shell, 23.0 g. of scattered charcoal, and a 1976 U.S. penny.

Layer II (c. 9-28 cmbs) was composed of reddish gray (2.5 YR 5/1) silt. This dry, compact stratum contained less than 20% by volume subangular cobbles and pebbles. The layer yielded items interpreted as food midden including 40.7 g. of common marine shellfish, 2.4 g. of Echinoderm body parts, a trace of crab shell, 0.2 g. of fish bone, and 0.3 g. of unidentified bone. Other recovered remains consisted of 0.2 g. of *kukui* nut shell, 25.4 g. of scattered charcoal, and two unworked basalt flakes. In addition, four subsurface features originated in this layer.

Feature 7.1 (c. 10-18 cmbs) consisted of a hearth remnant that was a maximum of 31 cm N/S by 24 cm E/W. The dark reddish gray (2.5 YR 4/1) feature fill yielded cultural materials including 0.6 g. of marine shellfish and 27.7 g. of charcoal.

Feature 7.2 was encountered at c. 18 cmbs and extended to 27 cmbs. This dark reddish gray (2.5 YR 3/1) hearth consisted of a basin shaped pit that was partly lined with fire cracked rocks on its northern side. It was a maximum of 56 cm. N/S by 45 cm. E/W and extended into the southern face of TU 1. Recovered cultural materials included 4.8 g. of marine shellfish remains, 0.1 g. of sea urchin body parts, and 123.0 g. of charcoal. One sample was placed in aluminum foil and submitted to Beta Analytic, Inc. in Florida for

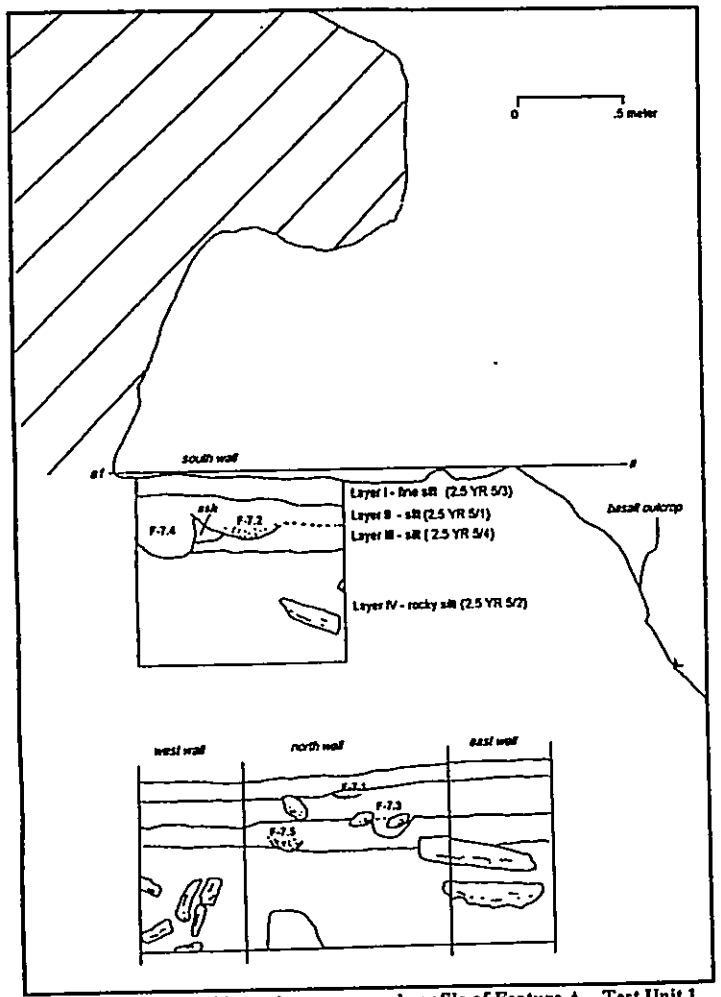


Figure 13 – South face profile, and wrap-around profile of Feature A—Test Unit 1.

radiometric analysis. This sample returned a conventional date of 260±60 BP. At 2 sigma (95% probability) the corrected date ranges were AD 1500-1690, 1730-1810, and 1920-1950, with a date at the intercept of the radiocarbon age with calibration curve of AD 1660 [Appendix A].

Feature 7.3 (c. 26-36 cmbs) consisted of a small semi-circular pit that was up to 16 cm. in diameter. The reddish brown (2.5 YR 5/3) pit fill of this feature was sterile. The function of this pit remains unclear.

Feature 7.4 (c. 20-34 cmbs) was partly capped by the Feature 7.2 hearth. This relatively deep pit extended into the northern, southern and western faces of TU 1. The weak red (2.5 YR 5/2) fill of this pit yielded 7.9 g. of scattered marine shellfish remains. The function of this pit continues to be unclear. Layer III (c. 26-39 cmbs) was composed of reddish brown silt that contained moderate amounts of subangular basalt cobbles and pebbles (c. 30% by volume). This compact stratum yielded a trace (0.3 g.) of marine shellfish remains and contained one subsurface feature.

Feature 7.5 consisted of a charcoal concentration that is tentatively interpreted as possible hearth remnant or a burned root. A total of 18.6 g. of charcoal were recovered from this otherwise sterile feature.

Layer III (c. 27 to 34 cmbs) was composed of reddish brown silt (2.5 YR 5/1). This relatively compact stratum contained c. 50% by volume subangular rocks—probably from roof collapse. A total of 0.3 g. of marine shellfish remains were recovered from the upper few centimeters of this layer.

Layer IV extended from c. 34 cmbs to the bottom of the unit. This weak red (2.5 YR 5/2) silty clay was very compact and yielded increasing amounts of weathered bedrock with depth. This stratum was sterile and TU 2 was abandoned at or near intact bedrock.

Feature B (Figure 14)

This second overhang lies c. 2 meters south or *mauka* of Feature A. While this second shelter is the larger of the two overhangs, an earth and rock pile that may represent possible push from the area above the shelter obscures much of its interior.[18] This relatively spacious rock shelter measures 4.5 meters N/S by 3.5 meters E/W by up to 1.7 meters high. No material culture remains were noted on the exposed portion of the floor of the overhang. One test unit was placed in an area that was free of the soil and rock that covered much of the floor.

Test Unit 2

This subsurface test was 50 by 50 cm. and a maximum of 50 cm. deep and was excavated near the back of the overhang. Three sterile soil layers were located before TU 2 was abandoned due to difficult digging conditions (Figure 14).

Layer I (0-24 cmbs) consisted of reddish brown (2.5 YR 4/4) clay. This compact stratum contained low amounts of subangular rock. Layer II (c. 16-38 cmbs) was composed of light reddish brown (2.5 YR 7/4) silt with moderate amounts of roof spall. Layer III extended from c. 25 cmbs to the bottom of TU 2 at c. 65 cmbs.

[18] The area at the top of the gulch has been bulldozed in the past—possibly from improvements to Honoapi'ilani Road.

Table 3

Summary of Subsurface Results – Test Unit 1—Site 5097

	L I, L 2 0-10 cmbs	Fea. 7.1 10-18 cmbs	L II, L I 9-19 cmbs	L II, L 2 19-28 cmbs	Fea. 7.3 18-27 cmbs	Fea. 7.4 20-34 cmbs	Fea. 7.5 28-33 cmbs	Layer III 27-36 cmbs
GASTROPODA								
Cellana sp.	1.9		8.2	3.1	0.4	0.1		
Conus sp.	0.4							
Cypraea sp.	0.8		6.5	1.2		6.8		
Granula sandwicensis	0.2		1.1	0.1				
Nerita picea	7.4	0.1	5.3	1.7		0.9		0.1
Nerita sandwicensis								
Planaxis sp.	11.5	0.5	8.7	3.3	0.4	0.1		0.1
Thaididae sp.	0.5							
Unidentified	1.8			0.1	4.0			0.1
BIVALVIA								
Isognomon sp.	0.6		1.1	0.3				
ECHINOIDEA								
Sea urchin	0.2		2.2	0.2	0.1			
Pencil urchin								
CRAB				0.1				
BONE								
Fish	0.2		0.1	0.1				
Unidentified			0.3					
FLORAL								
Kukui nut shell	2.1		0.2					
Charcoal	23.0	27.7	5.6	19.8	123.0		18.6	
UNWORKED BASALT FLAKES (pieces)			(2) 20.3					
UNWORKED CORAL (pieces)	(1) 0.2							
Historic Artifacts								
U.S. penny (1976)	1							

Discussion

Subsurface investigations at Site 4097 indicate that at least Feature A was utilized as a temporary habitation area. While TU 2 failed to yield any material culture remains, it seems likely that the Feature B overhang also served as a temporary shelter. As noted earlier, much of the floor area of this second overhang was unavailable for testing purposes due to slope wash and/or dozer push.

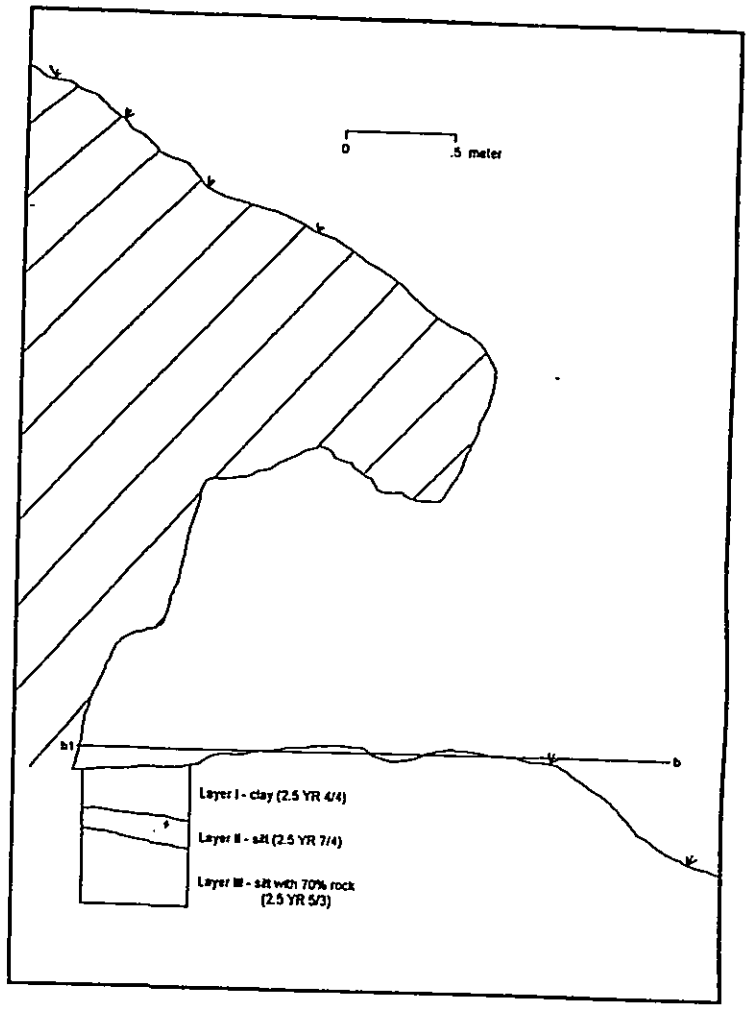


Figure 14 – North face profile of Feature B—Test Unit 2.

Site 5098 (Figures 15-17; Photos 12-13)

This site consists of a rock overhang that contains a burial. The site is located on the southwestern side of Alaelae Point. The overhang faces west overlooking a small bay locally known as Kahauiki (Jimenez and Rosendahl, 1995, p. B-5). A c. 6-meter high cliff lies c. 3 meters SSW of the site. It is estimated that Site 5098 is c. 20-22 ft. AMSL. Alien vegetation noted in the vicinity of this site consisted of ironwood trees, alien grasses and annual weeds, and a few *panini* (cactus). Surface visibility tended to good in the general area. Site 5098 is in good condition. The general area is informally used for fishing and surfing activities. A berm associated with Honoapi'ilani Highway lies upslope and c. 16 meters to the east of this site.

The overhang is 3.5 meters wide by 1.1 meters deep by 1.1 meters maximum height (Photos 12 and 13). Several pieces of water worn coral were noted on the surface of the overhang prior to subsurface investigation. One unit was utilized to test this coastal overhang.

Test Unit 1

This test unit measured c. 1.0 by 1.0 meter and was placed at the back of the overhang. Unit stratigraphy consisted of two layers—a deposit of relatively thick slope wash, and pit fill (Figure 15).

The slope wash—Layer I—was up to 20 cm deep and consisted of material that appeared to be derived from a nearby berm associated with Honoapi'ilani Highway. This light brown (7.5 YR 6/3) clay was sterile.

Layer II was encountered between 10 and 20 cmbs. This loose, brown (7.5 YR 5/2) silty loam is interpreted as burial pit fill. The upper 15-20 cm. of this fill layer contained numbers of waterworn pebbles and coral (200 + pieces). The pit fill contained quantities of subangular basalt cobbles. In addition, scattered material culture remains were found throughout this loose, rocky layer. These scattered remains included 46.6 g. of marine shellfish, 0.5 g. of Echinoderm body parts, 1.0 g. of dog teeth, a trace of fish bone, 14.2 g. of *kukui* nut, 47.5 g. of charcoal, 2 unworked basalt flakes, 7 pieces of branch coral, and an indigenous artifact. This artifact (Art. #4) was located at c. 84 cmbs and consists of a piece of water-rounded basalt that possesses a central cavity (Photo 2). While much of this artifact appears to be naturally formed, portions of its interior appear to have been enlarged. Some slight pecking and abrasion scars were visible on the interior of the artifact.[19] This artifact is tentatively interpreted as a *kukui* nut oil lamp. It was located in an upright position and was placed c. 15 cm. above what is interpreted as a human burial.

A human cranium was located at 94 cmbs in the northeastern corner of TU 1 (Figure 17). A portion of the cranium was exposed and it was determined that this individual is a sub-adult.[20] Inspection of the exposed portion of this cranium indicated

[19] Measurements are 280.0 x 180.0 x 80.0 mm.; weight is 3.85 kg.
[20] This determination is based on dentition.

that it is facing to the west *(makai)*. A large horizontal flat rock at least 75 cm. long by 40 cm. wide was exposed just to the west of the skull. This rock was left in place to avoid impacting the nearby cranium. No further work was conducted on this find that is interpreted as a primary burial.

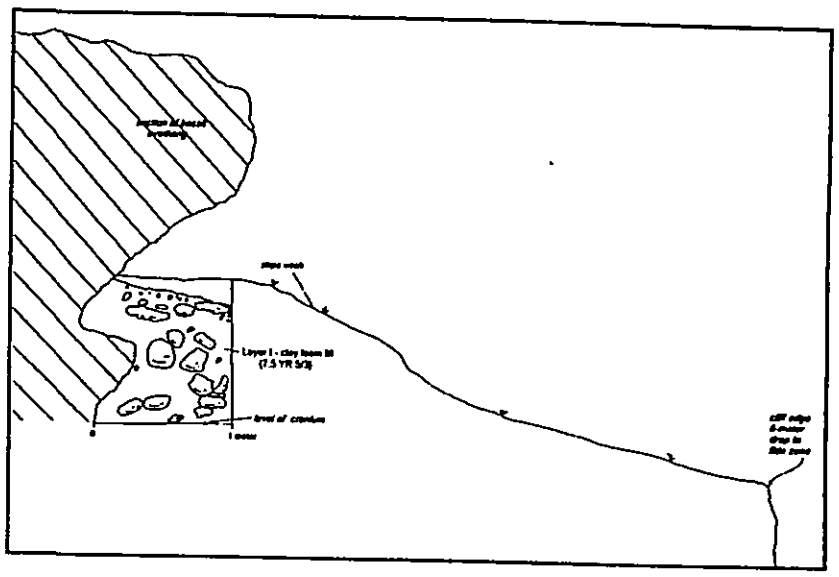
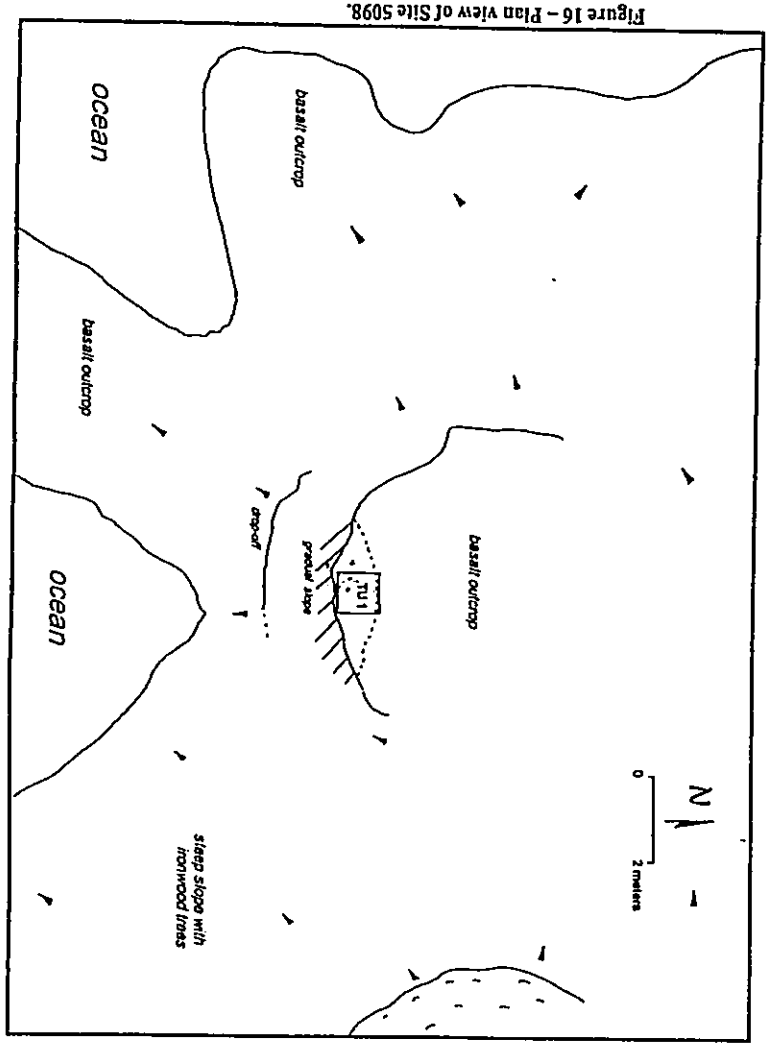


Figure 15 – East wall profile of Site 5098,Test Unit 1—excavated to depth of burial.

Discussion

Site 5098 lies along the coast and faces *makai*. The individual that is likely contained here appears to have been buried in an upright position facing the west. The *kukui* nut lamp (Artifact #4) was reinterred in the test unit, and Test Unit 1was back filled at the request of the Maui/Lana'i Islands Burial Council. Site 5098 is interpreted as a precontact coastal Hawaiian burial.

Figure 16 – Plan view of Site 5098.



As required by law, a Legal Notice was published in The Maui News and the Honolulu Advertiser on May 20, 21, and 23, 2001. Mr. Alexander Ross contacted Kapalua Land Company, Ltd. and he was subsequently interviewed by Erik Fredericksen. He indicated that he is a lineal descendent of the Koa family and of the individuals buried in the gravesite (Site 4142) on Parcel 31 [see discussions in previous archaeology and historic background sections of this report]. This parcel lies to the northeast of Site 5098, and was surveyed by PHRI in 1995. He was previously unaware of the fact that an unmarked burial is contained in this coastal rock overhang.

Table 4

Summary of Subsurface Results – Test Unit 1—Site 5098

	L II, L1 10-20 cmbs	L II, L2 20-30 cmbs	L II, L3 30-40 cmbs	L II, L4 40-50 cmbs	L II, L5 50-60- cmbs	L II, L6 60-70 cmbs	L II, L7 70-80 cmbs	LII, L8 80-90 cmbs	L II, L9 90-100 cmbs
GASTROPODA									
Cellana sp.	0.9	4.9						0.3	0.1
Conus sp.	0.5				1.2				
Cypraea sp.	5.9	5.0			18.9	2.0	0.4		1.2
Nerita picea			0.2				0.1		0.1
Planaxis sp.		0.1	0.1		0.1				
Strombus sp.		0.7			0.8				
Thaididae sp.		0.7							
Turbo sandwicensis									
Unidentified	0.2	1.8	0.2		0.1	0.1			
ECHINOIDEAN									
Sea urchin									
Pencil urchin				0.5					
BONE									
Teeth, mammal							0.7 (dog)		0.3
Fish		0.1							
Unidentified					0.1				
FLORAL									
Kukui nut shell	1.8	2.8	4.6			1.6	0.8	0.4	1.3
Charcoal	0.9	5.5	3.8			13.8	2.4	3.1	18.0
UNWORKED BASALT FLAKES (pieces)	(1) 1.4	(1) 0.2							
UNWORKED CORAL (pieces)	(1) 0.3				(3) 13.8	(1) 0.2	(2) 4.2		
FIRE-CRACKED ROCKS									
CHALCEDONY (*Jasper*)									
ARTIFACTS									
Basalt lamp								#4	

Weight in grams

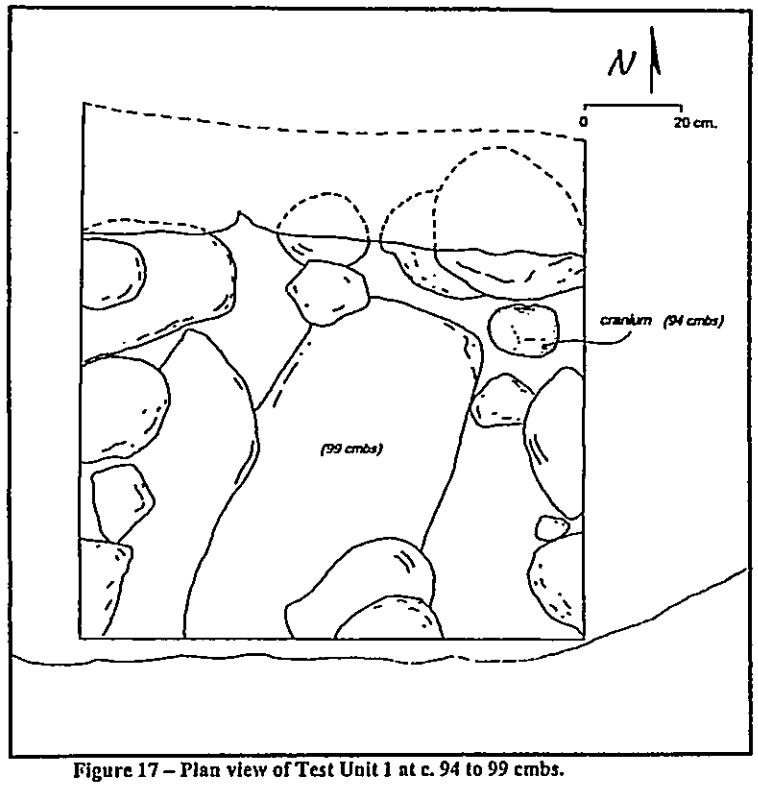


Figure 17 – Plan view of Test Unit 1 at c. 94 to 99 cmbs.

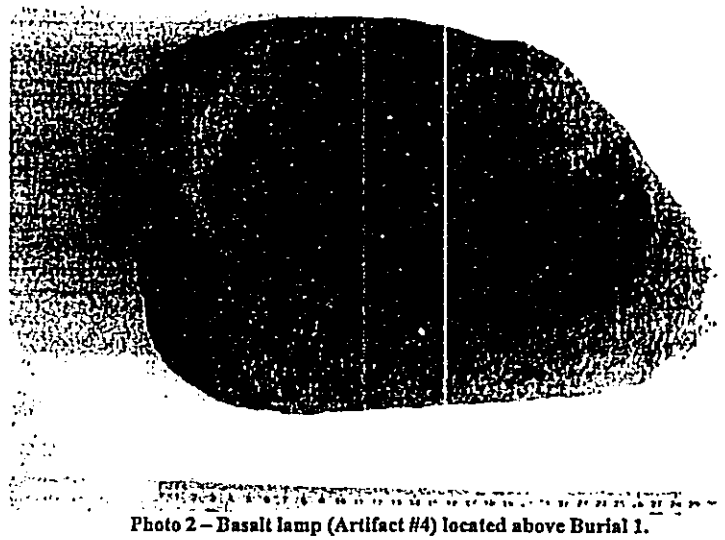


Photo 2 – Basalt lamp (Artifact #4) located above Burial 1.

Previously identified sites—Sites 5006 and 5007

Both of these sites were previously identified during an inspection of the southwestern portion of the project area in 2000 by Xamanek Researches (Fredericksen, 2000). This inspection was undertaken at the request of Kapalua Land Company, Ltd., in order to assess the potential impact of iron wood tree removal on unknown sites in a c. 245 meters (800 ft) long area along Honoapi'ilani Highway.[21] Two previously unidentified sites were located during this inspection and subsequently assigned SIHP No. 50-50-09-5006 and Site 5007.

Site 5006 (Figure 18)

Site 5006 consists of a plantation-era refuse dump. This first site is the most southwesterly one located on the project area. It essentially lies along the shoreline at the

[21] The existing proposal calls for the removal of these trees calls for them to be flush cut.

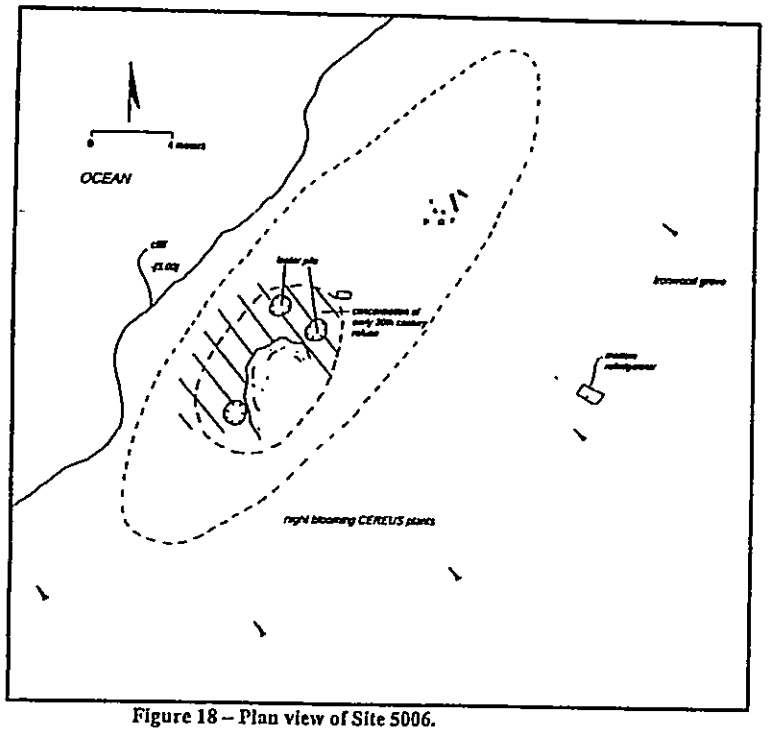


Figure 18 – Plan view of Site 5006.

base of a c. 5-meter high cliff. Vegetation noted in the area consisted of ironwood trees, alien grasses and annual weeds, and some night blooming cereus. This historic site measures c. 32 meters NE/SW by 10 meters NW/SE.

Noted surface remains included early bottle fragments (some with early 1900s finishes), various iron and metal parts, early 20th century ceramic sherds, and more recent refuse. The oldest surface artifacts were noted in an area c. 6-meters NW/SE by 10 meters NE/SW (Figure 18). At least three site-looting pits were noted during our survey. All three of these looter pits were located in the area with older artifacts. There was no subsurface testing done at this historic refuse dump, nor were items lying on the surface collected.

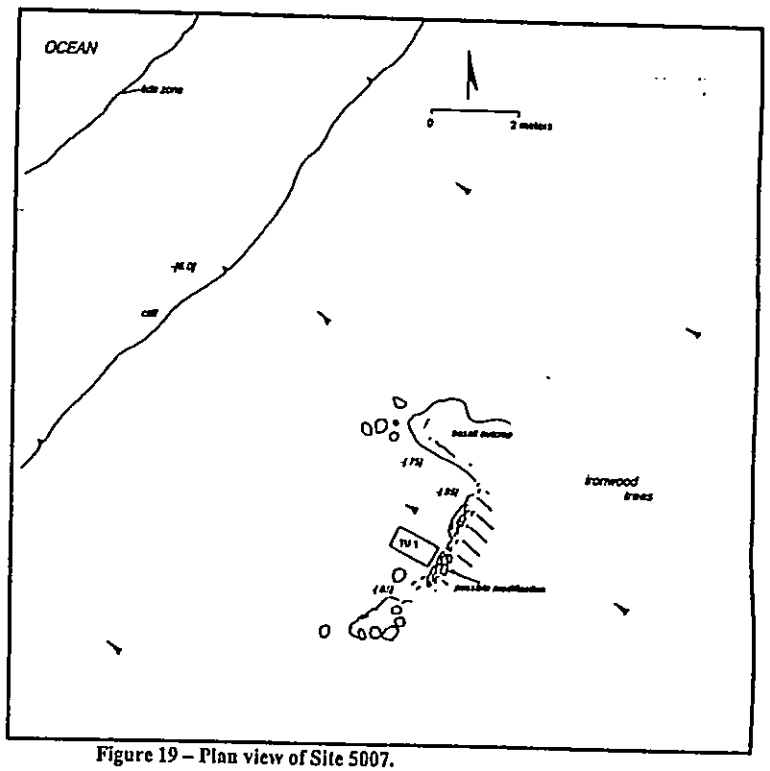


Figure 19 – Plan view of Site 5007.

Site 5007 (Figures 19-20; Photo 14)

This second previously identified site lies c. 250 meters northeast of Site 5006. Site 5007 is near the ocean and consists of a partial enclosure. A c. 6-meter high cliff separates this site from the boulder shoreline. Vegetation noted in this sloping (c. 20%) area included ironwood trees, alien grasses and annual weeds, and isolated *'ilima* shrubs. It is estimated that this site lies c. 20-25 ft AMSL.

Site 5007 is a single component site consisting of an "L-shaped" modified outcrop that forms a partial enclosure (Photo 14). The open portion of this enclosure faces the nearby ocean. It measures c. 6 meters NE/SW by 2.1 meters NW/SE and is a maximum of 85 cm. in height. This site is in generally fair to good condition and appears to be

unaltered. Surface duff composed primarily of decayed ironwood needles covers much of surface in the vicinity of this site. Scattered modern refuse was noted on the surface to the northwest of this enclosure. One test unit was utilized to investigate subsurface conditions at this enclosure.

Test Unit 1

This test unit measured 1.0 WNW by 0.5 meter and was up to 60 cm. in depth. Two strata were encountered before TU 1 was terminated at bedrock (Figure 20).

Layer I (c. 0-18 cmbs) was composed of brown (7.5 YR 5/4) silty clay loam with 30% by volume of weathered bedrock. Material culture remains recovered from this loose stratum included 1.4 g. of fish bone, and 1.8 g. of mammal (non-human) bone. No additional subsurface cultural materials were found in this layer.

Layer II (c. 11-28 cmbs) consisted of light brown (10 YR 6/3) silty clay and weathered bedrock. This slightly compact layer was sterile, and excavation was terminated at bedrock.

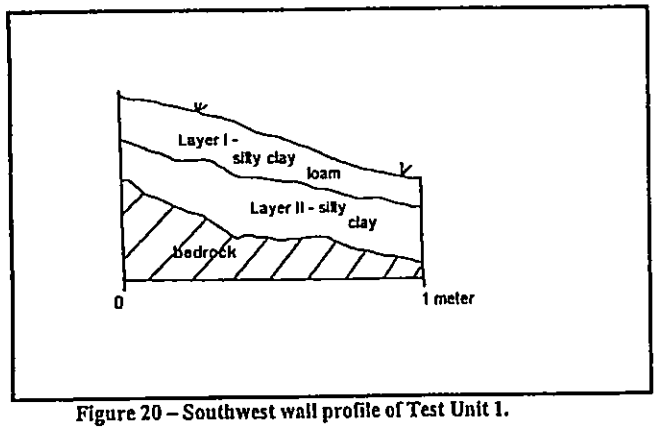


Figure 20 – Southwest wall profile of Test Unit 1.

Discussion

Given this site's proximity to the ocean, it appears plausible that it could have been used as a temporary shelter for fishermen. However, there were no precontact artifacts or post-contact materials recovered during the excavation of TU 1.

Radiometric Dating Analysis

One radiocarbon date was obtained from Site 5097—a rock overhang shelter—Feature A. There were a number of subfeatures found in Test Unit 1. Feature 7.2 was a basin shaped fire-pit that contained over 100 grams of charcoal and numerous fire-cracked rocks. It occurred between 18 and 27 cm. below the surface. The radiocarbon age was 240 +/- 60 BP, and the calibrated date brackets are AD 1500 to 1690, AD 1730 to 1810, and AD 1920 to 1950. The intercept date falls at AD 1660. This date is roughly in the same time bracket as other coastal habitation site dates for this section of Maui.

Table 5

Radiocarbon dates for coastal habitation sites in the Kapalua vicinity

Beta #	Location/provenience	Radiocarbon age	Calendric dates	Intercept date	Firm
143073	Coconut Grove, Kapalua Site 4815, Feature 1, hearth	290 +/- 40 BP	AD 1490 to 1665	AD 1640	XR
85034	Site 4144, [PHRI 1995] Feature B, 20-40 cmbs	210 +/- 50 BP	AD 1528-1555 AD 1633-1704 AD 1720-1820 AD 1916-1954		PHRI
156508	Site 5097, Feature A rock overhang, fire pit (present study)	240 +/- 60 BP	AD 1500-1690 AD 1730-1810 AD 1920-1950	AD 1660	XR

SUMMARY AND CONCLUSIONS

A total of six previously unidentified archaeological sites were located during our inventory survey. These cultural resources have been assigned SIHP No. 50-50-09-5093-5098. In addition, information was gathered on two previously identified sites—Sites 5006 and 5007. Each of these sites is briefly discussed below.

Site 5093 lies on Kalaepiha Point and consists of a paved platform/enclosure (Feature A) along with an associated access trail to what is interpreted as a fish spotting station (Feature B). Excavation at the Feature A enclosure/platform revealed a water worn pavement and yielded low amounts of material culture remains including three indigenous artifacts. Information obtained from informants indicates that this area has continued to be an important traditional fishing area into recent times. Portions of Site 5093 have been impacted by previous earth moving activities. Feature A of this site is interpreted as a probable ceremonial structure that was likely associated with fishing activities in precontact times, and possibly into the post-contact period. Feature B appears to be a fish spotting station that may still be utilized by contemporary fishermen. Site 5093 is considered to be the most culturally significant site identified during the inventory survey.

Site 5094 is tentatively interpreted as a remnant of a precontact habitation area that also lies on Kalaepiha Point. This site has been impacted by previous land clearing activities. It is in generally poor condition.

Site 5095 is located near Kalaepiha Point and is interpreted as a remnant of the Old Government Road. This site remnant consists of a section of dry laid rock retaining wall and the old road cut. The site is in generally fair condition. It is the only remnant of the old road that was encountered on the project area.

Site 5096 is a remnant of the old slaughterhouse that was built on the point in the early 1900s. This site remnant consists of a concrete slab. Bulldozing activities have impacted the general area around this site. Site 5096 is in poor condition.

Site 5097 consists of two rock overhang shelters (Features A and B) that are located near Mokuleia Bay. Subsurface investigation at Feature A yielded moderate amounts of material culture remains along with four subsurface features. A charcoal sample from a hearth (Feature 7.2) returned a conventional date range of 260±60 BP. At 2 sigma (95% probability) the corrected date ranges for this sample are AD 1500-1690, 1730-1810, and 1920-1950. The lack of any recognizable post-contact cultural materials tends to support the earlier date ranges. Feature B was tested with negative results. However, it is important to note that much of the floor of this shelter was unavailable for testing because it was covered by what appeared to be relatively recent slope wash from a bulldozed area on the ridge above this overhang. Site 5097 is interpreted as a temporary habitation area that was likely associated with marine resource acquisition. Its location would have provided attractive temporary shelter to individuals engaged in this kind of activity. Even with a lack of subsurface cultural material, it seems likely that this site could have been utilized during the late-precontact period and early post-contact times, when such activities were still part of the subsistence pattern.

Site 5098 lies on the southwestern side of Alaelae Point. This site is interpreted as coastal burial of a sub adult. Limited excavation at this site produced indigenous material culture remains including a *kukui* nut lamp. Given the location and the context of this site, it is interpreted as a precontact Native Hawaiian burial. This site is in generally good condition.

Site 5006 was identified in an earlier inspection of a portion of the project area, but not assessed. This site consists of a plantation-era rubbish dump. Bottle hunters have looted portions of this site and its overall integrity is poor.

Site 5007 consists of a modified outcrop that forms an "L" shaped partial enclosure. This coastal site was tested and yielded very low amounts of material culture remains. Given this site's proximity to the shoreline, it appears that it may have served as temporary shelter for persons engaged in fishing activities. It is possible that this site was utilized in both precontact as well as post-contact times.

Site Significance Assessments

The following significance evaluations are based on the Rules Governing Procedures for Historic Preservation Review (DLNR 1996; Chapter 275). According to these rules, a site must possess integrity of location, design, setting, materials, workmanship, feeling and association and shall meet one or more of the following criteria:

Criterion "a"—Be associated with events that have made an important contribution to the broad patterns of our history;

Criterion "b"—Be associated with the lives of persons important in our past;

Criterion "c"—Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

Criterion "d"—Have yielded, or is likely to yield, important information for research on prehistory or history;

Criterion "e"—Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts.

Table 6 summarizes the significance assessments for the sites located on the project area. Sites 5006, 5007, and 5093-5098 qualify for significance under Criterion 'd"—for their information content. In addition, several of the sites qualify for importance under multiple significance criteria. Site 5093, a paved platform/enclosure and fish spotting station with trail, also qualifies under Criterion "e"—as a place of significance to the Native Hawaiian culture. The remnant of the Old Government Road—Site 5095—qualifies under Criterion "a", because of it is an important part of the post-contact transportation patterns on Maui. Site 5098—the coastal burial—qualifies under Criterion "e"—for its Native Hawaiian cultural significance.

Mitigation Recommendations

Six of the eight sites discussed above retain their significance assessments. In-place preservation is recommended for Sites 5007, 5093, 5095, 5097 and 5098. Most of these sites are located in areas that pose relatively few preservation problems. The integrity of Site 5094 has been altered by previous land clearing activities, and additional work in the form of data recovery is recommended if in-place preservation is not feasible for this site remnant. Sites 5006 and 5096 have yielded adequate information and no further work is recommended for them.

Table 6

Site Assessments and Mitigation Recommendations

Site Number	Description	Function	Significance	Mitigation
5006	Plantation-era dump	Refuse disposal	D	NLS*
5007	Modified outcrop	Temporary shelter	D	Preservation in place
5093	Kalaepiha Point Feature A Paved platform/enclosure	Probable ceremonial structure associated with traditional fishing area	D, E	Preservation in place
	Feature B Leveled observation area	Traditional fish-spotting area, still being used	D, E	Preservation in place
5094	Kalaepiha Point Surface site which has undergone alteration	Precontact habitation area remnant	D	Preservation in place Or data recovery[22]
5095	Old Government Road	Transportation	A, D	Preservation in place
5096	Historic concrete slab	Former slaughterhouse	D	NLS
5097	Two rock overhang shelters	Precontact temporary habitation area	D	Preservation in place
5098	Alaelae Point rock overhang	Burial site containing one subadult	D, E	Preservation in place

*No longer significant.

[22] In the event that preservation is not feasible, data recovery should be undertaken.

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APPENDIX A

Radiometric Analysis

by
Beta Analytic, Inc.
Miami, Florida

BETA ANALYTIC INC.
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REPORT OF RADIOCARBON DATING ANALYSES

Dr. Walter Fredericksen — Report Date: 6/21/01

Xamanek Researches — Material Received: 6/14/01

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 156508	260 +/- 60 BP	-25.9 o/oo	240 +/- 60 BP

SAMPLE : KAPALUA MAKAI 61
ANALYSIS : Radiometric-Priority delivery
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid
2 SIGMA CALIBRATION : Cal AD 1500 to 1690 (Cal BP 450 to 260) AND Cal AD 1730 to 1810 (Cal BP 220 to 140)
Cal AD 1920 to 1950 (Cal BP 30 to 0)

Dates are reported as RCYBP radiocarbon years before present, "present" = 1950A.D.). By international convention, the modern reference standard was 95% of the C14 content of the National Bureau of Standards' Oxalic Acid I, calculated using the Libby C14 half life (5568 years). Quoted errors represent 1 standard deviation statistics (68% probability) I are based on combined measurements of the sample, background, and modern reference standards.

Measured C13/C12 ratios were calculated relative to the PDB-1 international standard and the RCYBP ages were normalized to -25 per mil. If the ratio and age are accompanied by an (*), then the C13/C12 value was estimated, based on values typical of the material type. The quoted results are NOT calibrated to calendar years. Calibration to calendar years should be calculated using the Conventional C14 age.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-25.9:lab. mult=1)

Laboratory number: Beta-156508

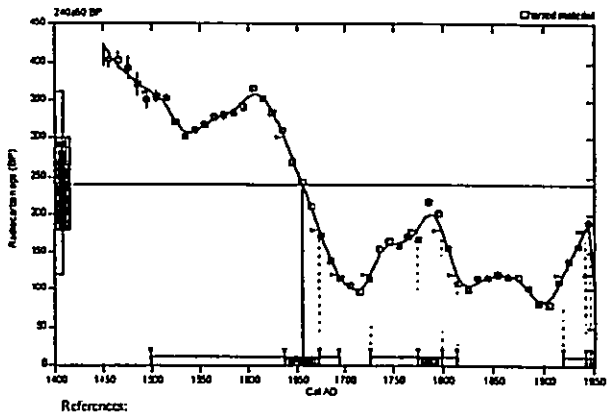
Conventional radiocarbon age: 240±60 BP

2 Sigma calibrated results: (95% probability) Cal AD 1500 to 1690 (Cal BP 450 to 260) and Cal AD 1730 to 1810 (Cal BP 220 to 140) and Cal AD 1920 to 1950 (Cal BP 30 to 0)

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1660 (Cal BP 290)

1 Sigma calibrated results: (68% probability) Cal AD 1640 to 1670 (Cal BP 310 to 280) and Cal AD 1770 to 1800 (Cal BP 180 to 150) and Cal AD 1940 to 1950 (Cal BP 10 to 0)



References:

Database used

Calibration Database
Editorial Comment
Stuiver, M., van der Plicht, H., 1998, Radiocarbon 40(3), pxii-xiii
INTCAL98 Radiocarbon Age Calibration
Stuiver, M., et al., 1998, Radiocarbon 40(3), p1041-1083
Mathematics
A Simplified Approach to Calibrating C14 Dates
Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-323

Beta Analytic Inc.

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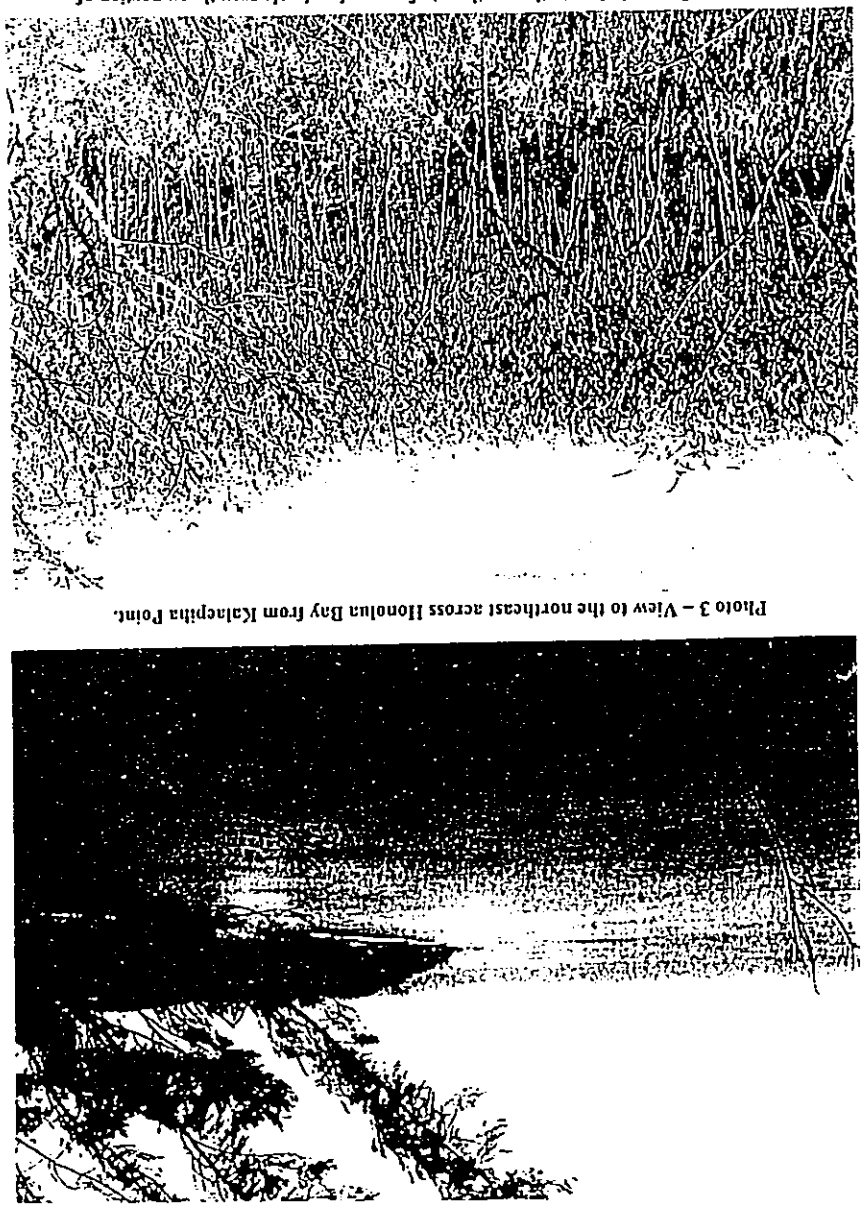


Photo 3 – View to the northeast across Honolua Bay from Kalaepiha Point.

Photo 4 – General view to the northeast of young *koa haole* growth on portion of Kalaepiha Point. Site 5093 lies at the crest of the rise; Site 5094 at right. 53

Photo 5 – View to the northwest over a portion of Feature A—Site 5093.

Photo 6 – Plan view of pavement exposed in Test Unit 2, Site 5093—Feature A. 54

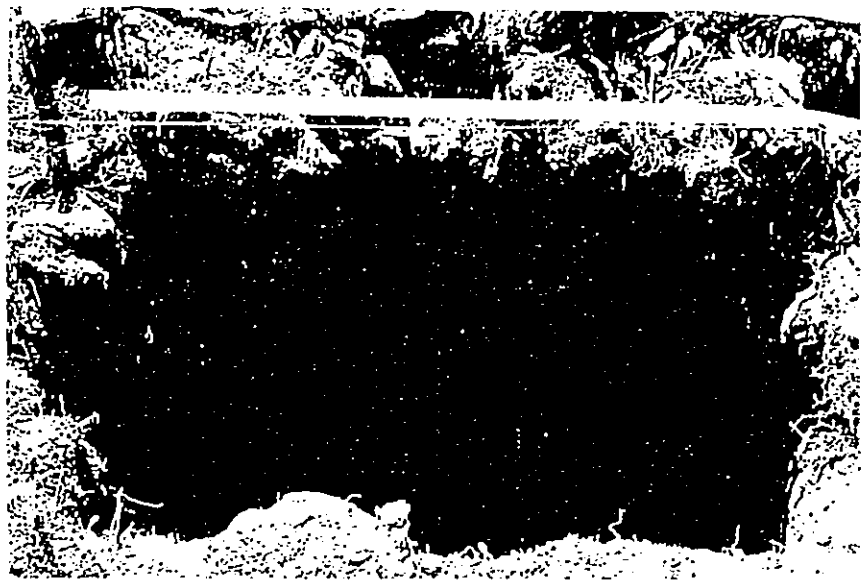


Photo 7 – West face profile of Test Unit 4, Site 5093—Feature A.

Photo 8 – View to the northeast across a portion of Feature B—Site 5093.

Photo 9 – View to the east of a portion of the Site 5095 retaining wall (Honoapi'ilani Highway in background).

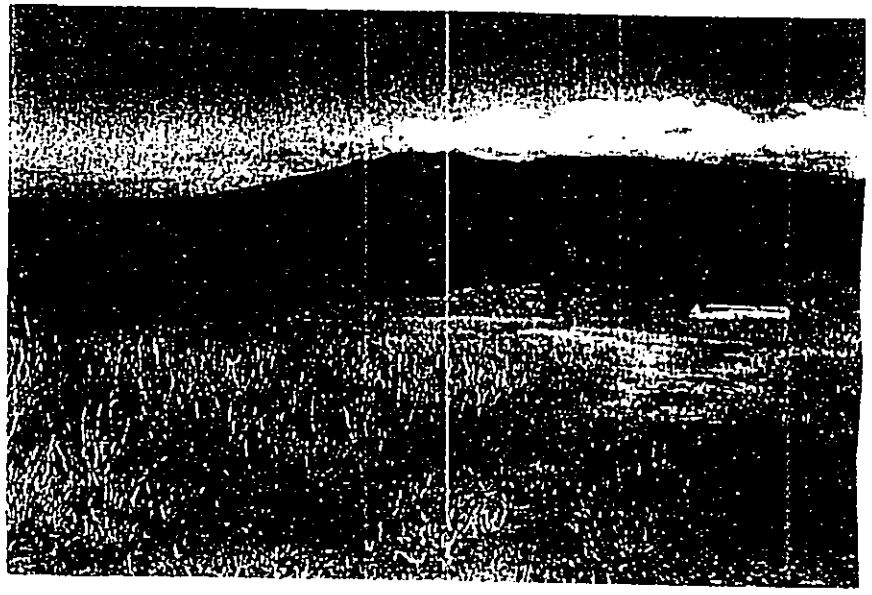


Photo 10 – View to the west across Site 5096—old concrete foundation at right.

Photo 11 – View to the southeast of Feature B overhang, Site 5097. Portion of Feature A visible at left.

Photo 12 – View to the northeast across Site 5098. Honoapi'ilani Highway berm in upper right.

Photo 13 – View to the southwest across Site 5098.

Photo 14 – View to the northeast across Site 5007.

PRESERVATION PLAN FOR SITES 50-50-01-5007, 5093, 5094, 5095 AND 5097, KAPALUA *MAKAI* PROJECT AREA, HONOLUA *AHUPUA'A*, LAHAINA DISTRICT, ISLAND OF MAUI (TMK: 4-2-04: POR. 32)

Prepared on behalf of:

Mr. Ryan Churchill, Project Manager
Kapalua Land Company, Ltd.
Kapalua, Maui

Prepared by:

Erik Fredericksen
Xamanek Researches
Pukalani, Maui

10 October 2003

INTRODUCTION

Xamanek Researches conducted an archaeological inventory survey of a 23 acre coastal parcel of land in Honolua on behalf of Kapalua Land Company, Ltd. in the late spring of 2001. The project area lies *makai* (west) of Honoapi'ilani Highway, in Honolua *ahupua'a*, Lahaina District (TMK 4-2-04: 32). This elongated parcel is an estimated 1.3 km. in length and varies from c. 25 meters to up to 250 meters in width. Hugh Coflin, Mark Donham and Daniel Vicars conducted the fieldwork, and Erik Fredericksen was the project director for this earlier inventory survey.

A total of six previously unrecorded archaeological sites were located during the 2001 inventory survey (Figure 2). These cultural resources were subsequently assigned SIHP No. 50-50-01-5093 through 5098. The sites consisted of a paved enclosure with an associated access trail and probable fish-spotting station (Site 5093), a remnant of a possible habitation area (Site 5094), a remnant of the Old Government Road (Site 5095), an old concrete slab associated with a former slaughter house (Site 5096), two coastal rock overhang shelters (Site 5097), and an *in situ* coastal burial (Site 5098). In addition, more information was gathered on two previously identified sites—a plantation-era refuse dump (Site 5006), and a small coastal enclosure (Site 5007).

Sites 5006, 5007, and 5093-5098 qualified for significance under Criterion 'd"—for their information content. In addition, several of the sites qualified for importance under multiple significance criteria. Site 5093, a paved platform/enclosure and probable fish spotting station with trail, qualified for significance under Criterion "e"—for its importance to the Native Hawaiian culture. The remnant of the Old Government Road—Site 5095—qualified under Criterion "a", because it was an important part of the post-contact transportation patterns on Maui. Site 5098—a coastal burial—qualified under Criterion "e"—for its Native Hawaiian cultural significance. Of the above sites, the plantation-era refuse dump—Site 5006, and the remnant concrete slab of the former slaughter house—Site 5096 were determined to be no longer significant for their information content. All other sites retain their significance under one or more criteria.

The State Historic Preservation Division (SHPD) reviewed our inventory survey report and approved it in a 25 July 2002 letter (DOC NO: 0207MK09). Approved mitigation measures for Sites 5007, 5093, 5094, 5095, 5097 and 5098 consisted of passive "as is" preservation. We were subsequently contracted to prepare a Preservation Plan for the Site 5098 burial, as well as a Preservation Plan for the remaining five sites.[1]

[1] Th plan for Site 5098 which consists of a preservation plan and a burial treatment was recently approved at the 27 January 2003 meeting of the Maui/Lana'i Islands Burial Council.

The following plan presents the various preservation issues for the five sites noted above—Sites 5007, 5093, 5094, 5095, and 5097.

Study Parcel

This narrow parcel undulates along the shoreline of Mokuleia and Honolua Bays. At two places, near Alaelae Point and Kalaepiha Point, Honoapi'ilani Highway moves further inland. The elevation of the study area extends from sea level to c. 80 feet AMSL.

The soils in the area consist of Molokai silty clay loam of the Waiakoa-Keahua-Molokai association, which occur over *pahoehoe* rock. These well-drained soils are formed from material weathered from basic igneous rock. They range from nearly level to relatively steep, and extend up to 1000 feet in elevation (Foote et al., 1972). Rainfall amounts to about 20-30 inches per year, and the vegetation in the project area is quite thick in some locations. The flora consists primarily of introduced species, including *koa haole* (Leucaena glauca), ironwood (Casuarina equisetifolia), Christmasberry (Schinus terebinthifolius), red hibiscus (Hibiscus rosa-sinensis), night-blooming cereus (Hylocereus undatus), and various shrubs, grasses and annual weeds. In addition, *hau* (Hibiscus tiliaceus), *kukui* (Aleurites moluccana) and *'ilima* (Sida fallax) were also noted.

PREVIOUS ARCHAEOLOGICAL WORK ON SITES 50-50-01-5007, 5093, 5094, 5095 AND 5097

Site 5093 on Kalaepiha Point (Figures 3 and 4)

This northeasterly most site lies on Kalaepiha Point, which borders the southwestern portion of Honolua Bay and has a commanding view of the coast to the northeast and southwest. This portion of the project area drops off sharply to the northeast an estimated 30 meters (100 ft) to Honolua Bay below. The general area appeared to have been previously cleared with a number of years before our inventory survey. Site 5093 consists of two components—a platform/enclosure (Feature A) and an access trail to a possible fish spotting station (Feature B). Feature B consists of an unpaved trail that extends from near the northwestern portion of the Feature A enclosure to what is an excellent vantage point that overlooks Mokuleia Bay to the southwest, and Honolua Bay to the northeast (Figure 2).[2] Oral history information supplied by Mr. William Waiohu of the Maui/Lana'i Islands Burial Council, and Mr. Aimoku Pali of Honokohau Valley indicates that this portion of Kalaepiha Point was utilized in relatively recent historic times as a fish-potting station. No modifications of the vantage point or the trail were noted during several inspections of the area in 2001.[3]

Subsurface testing in the interior of Feature A revealed a water worn pebble—*'ili 'ili*—pavement. This feature is interpreted as a remnant of a ceremonial structure. As noted above, this site appears to have been impacted by previous land altering activities.

[2] This portion of Kalaepiha Point may be the area near Honolua Bay that was referred to by Mr. Clement Kamaka (Jimenez and Rosendahl, 1995).

[3] Erik Fredericksen visited Site 5093 on separate occasions with Mr. William Waiohu of the Maui Lana'I Islands Burial Council, and Mr. Leslie Kulololo of Na Kupuna o Hawai'i. While both men were previously unaware of the existence of the Feature A platform/enclosure, they each strongly felt that it had a ceremonial function, based on its location. In addition, both men recalled having heard from *Kupuna* that the Kalaepiha Point area was an important fish spotting area.

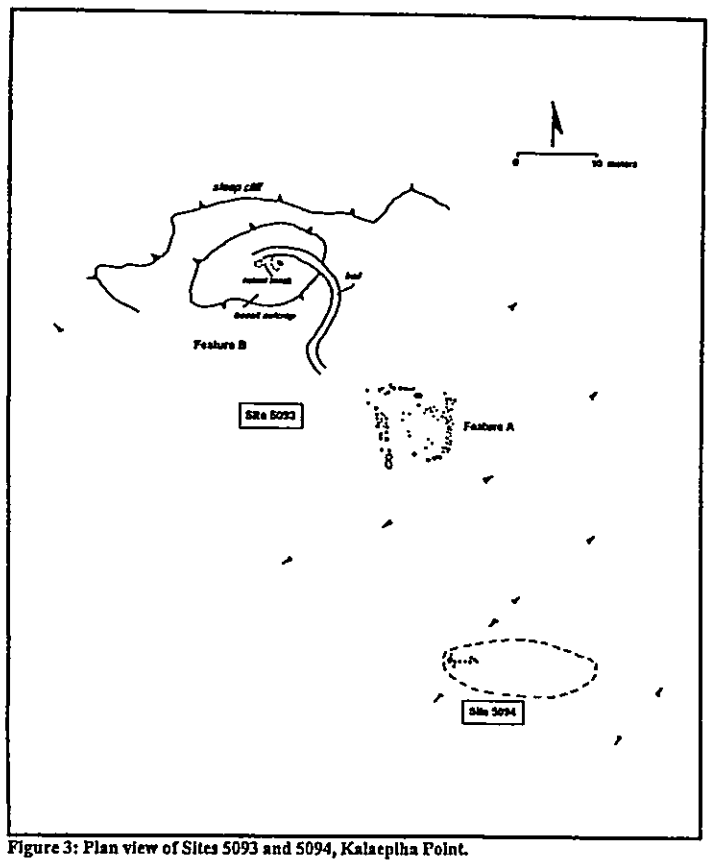


Figure 3: Plan view of Sites 5093 and 5094, Kalaepiha Point.

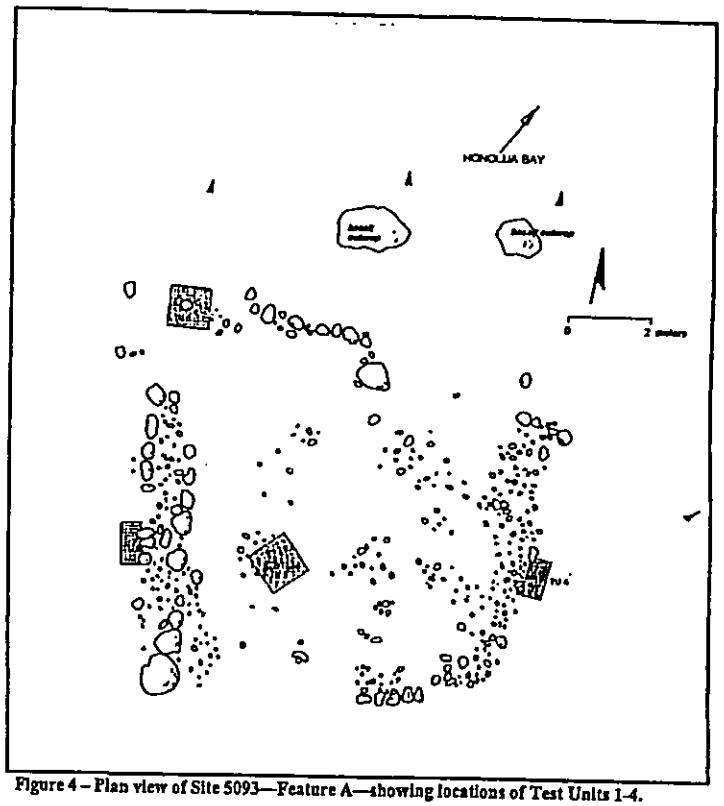


Figure 4 – Plan view of Site 5093—Feature A—showing locations of Test Units 1-4.

Site 5094 (Figure 3 and 5)

This site remnant lies within 30 meters southeast of Site 5093 on the slope of the knoll at c. 80-85 ft. AMSL. Site 5094 is composed of a short alignment/terrace remnant and a very low-density surface scatter. This site also has been impacted by previous land clearing activities. Weathered bedrock is visible along portions of the slope in and above the site. Scattered modern refuse was noted on the surface in the vicinity of this site remnant.

Site 5094 is in generally poor condition. The overall dimensions of this site are c. 18 meters E/W by 7 meters N/S (Figure 8). The low-density surface scatter consists of a few pieces of marine shellfish remains, water worn pebbles and coral. One indigenous artifact, a large basalt grinding stone was recovered from the previously disturbed surface and recorded. Site 5094 has been impacted by previous land clearing activities. While the age of this site remains somewhat unclear, it appears probable that it is a precontact rather than a post-contact historic property. Its function remains somewhat unclear, given the previous disturbance. However, based on the presence of scattered shellfish remains and the grind stone artifact, Site 5094 is tentatively interpreted as a possible habitation area remnant.

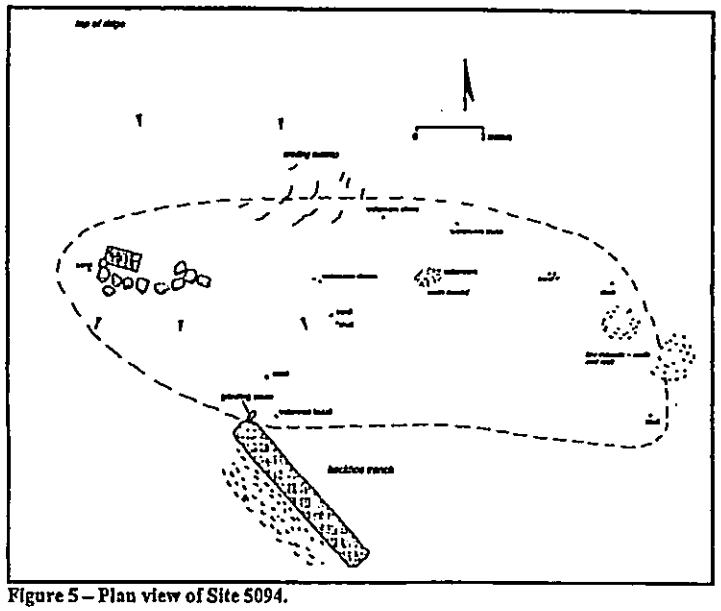


Figure 5 – Plan view of Site 5094.

Site 5095 (Figure 6 and Appendix A for preservation area)

This site consists of a remnant of the Old Government Road and an associated retaining wall that crosses a portion of the project area.[4] This site is paralleled by Honoapi'ilani Highway on its eastern side. Site 5095 is truncated by a dirt access roadway that is probably associated with the former slaughterhouse (Site 5096) on its southwestern side, and by the new highway on its northeastern side. Site 5095 is in generally poor to fair condition.

The visible remnants of this site include the old road cut and a dry laid retaining wall. The intact portion of the road cut extends some 60 meters NNE/SSW by 35 meters WNW/ESE and measures c. 7.5 meters in width. The intact portion of the retaining wall is c. 12 meters NW/SE and is up to 75 cm. high. This portion of the Old Government Road is the only recognizable remnant of this late 1800's roadway encountered in the project area.

Kapalua Land Company, Ltd. proposes to preserve approximately two thirds of this site (Appendix A). The proposed preservation area will consist of a 6,837 square foot portion of the site that will include a c. 22 meter (70 foot) long section of the old road berm as well as the rock retaining wall (see Kalaepiha Point Subdivision Description in Appendix A of this report).

[4] In other areas of Maui the old government road *(aupuni)* followed the Alaloa trail, which was built in c. 1516 by Kihapi'ilani following his conquest of the whole island (Fleming, 1933, p.7—Handy and Handy, 1972, p. 489). The section of the government road in this part of Maui was originally constructed in the late-1800s according to Mr. William Walohu and was subsequently modified through the mid-1900s.

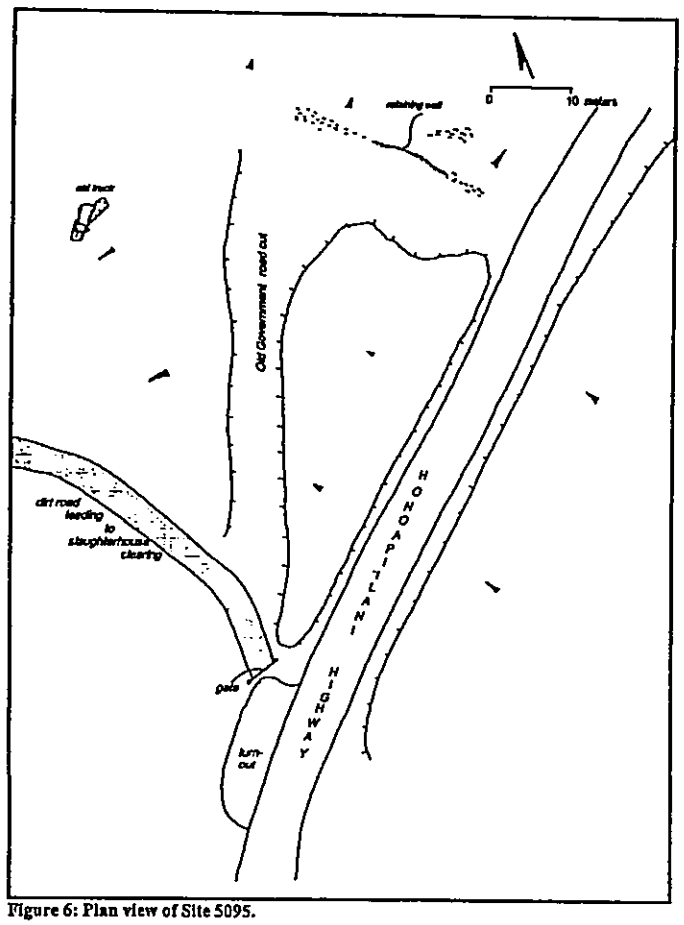


Figure 6: Plan view of Site 5095.

Site 5097 (Figure 7)

This coastal site is located near a concrete beach access walkway to Mokuleia Beach (Slaughterhouse Beach). It consists of 2 rock overhang shelters that lie within c. 35 meters of the shore. Previous land clearing activities associated with Honoapi'ilani Road improvements appear to have impacted the area at the top of the ridge above the site. These overhang features are situated within 5 meters of one another below this disturbed area.

Subsurface testing was carried out at both features, and one charcoal sample was submitted to Beta Analytic, Inc. in Florida for radiometric analysis. This sample returned a conventional date of 260±60 BP. At 2 sigma (95% probability) the corrected date ranges were AD 1500-1690, 1730-1810, and 1920-1950, with a date at the intercept of the radiocarbon age with calibration curve of AD 1660. Based on subsurface testing results, Site 5097 is interpreted as a temporary habitation area that was first used in the late precontact period, with subsequent usage.

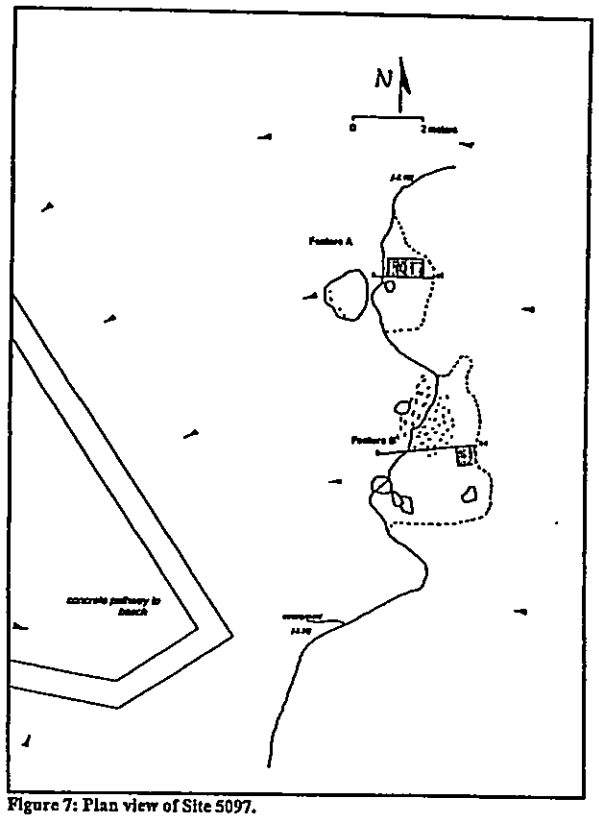


Figure 7: Plan view of Site 5097.

Previously identified Site 5007

This site was previously identified during an inspection of the southwestern portion of the project area in 2000 by Xamanek Researches (Fredericksen, 2000). This assessment was undertaken at the request of Kapalua Land Company, Ltd., in order to assess the potential impact of iron wood tree removal on unknown sites in a c. 245 meters (800 ft) long area along Honoapi'ilani Highway.[5] Two previously unidentified sites were located during this inspection and assigned SIHP No. 50-50-09-5006 and 5007.

[5] The existing proposal calls for the removal of these trees and for them to be flush cut.

Site 5007 (Figure 8)

This second previously identified site lies c. 250 meters northeast of Site 5006. Site 5007 is near the ocean and consists of a partial enclosure. A c. 6-meter high cliff separates this site from the boulder shoreline. It is estimated that this site lies c. 20-25 ft AMSL.

Site 5007 is a single component site consisting of an "L-shaped" modified outcrop that forms a partial enclosure. The open portion of this enclosure faces the nearby ocean. It measures c. 6 meters NE/SW by 2.1 meters NW/SE and is a maximum of 85 cm. in height. This site is in generally fair to good condition and appears to be unaltered. It appears possible that fishermen may have utilized this structure as a shelter.

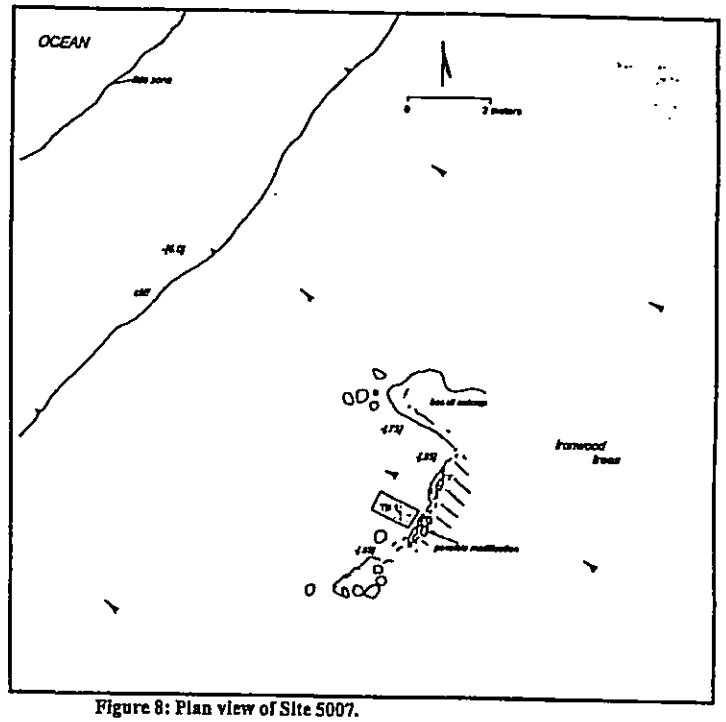


Figure 8: Plan view of Site 5007.

PRESERVATION PLAN FOR SITES 50-50-01-5007, 5093, 5094, 5095 AND 5097, HONOLUA *AHUPUA'A*, LAHAINA DISTRICT, ISLAND OF MAUI (TMK: 4-2-04: POR. 32)

The plan outlined here follows suggestions in the SHPD rules (HAR Title 13, Subtitle 6, Chapter 148, pp. 2-5).

Identification of Site(s) to be preserved

Six sites are recommended for passive "as is" preservation on the subject parcel—Site 5093 (a paved enclosure with associated access trail and probable fish-spotting station), Site 5094—a remnant of a possible habitation area, Site 5095—a remnant of the Old Government Road, Site 5097—two coastal rock overhang shelters, and Site 5007—a small coastal enclosure. As previously noted, Site 5098 has been covered under a separate preservation plan (Fredericksen, October 2002).

Preservation Tasks

Recommended mitigation measures for the above sites consist of passive "as is" preservation. While these sites have limited interpretive value and are recommended for passive "as is" preservation, small identification signs are nevertheless recommended for Sites 5093 and 5094. It is felt that this step is necessary, in order to help ensure their long-term integrity.

Short-term preservation

To help ensure protection of the cultural features during possible future project construction on Kalaepiha Point, it is recommended that Sites 5093, 5094 and 5095 first be marked with orange-plastic construction fencing or other means of delineating the site perimeters in order to reduce the possibility of inadvertent damage. It is also recommend that all *koa haole* trees be flush cut within the recommended site preservation buffer areas and the tree roots left in place to rot. This methodology will help minimize potential disturbance to the sites slated for preservation.

Long-term preservation

As noted earlier, Site 5093, 5094, 5095, 5097 and 5007 are recommended for passive "as is" preservation. Recommended long-term actions for each of these sites are listed below:

Site 5093 (refer to Figures 3 and 4)

1. Site 5093 lies on the northeastern portion of Kalaepiha Point. Access to the preservation area will be from the shoulder of Honoapi'ilani Road to the east of the site.

2. A sign will be placed on the southeastern (*mauka*) side of the Site 5093 preservation area. The placement of this sign will help to inform the viewer of the site's significance. Text and graphics should relay basic information revealed from archaeological testing of the feature (i.e., age and function).

3. Provisions for access to the general site area will be made for native Hawaiian members of the community who wish to visit it for traditional cultural purposes. A 7 day notice to the property owner is requested prior to access.

4. At this time, minimal landscaping actions are recommended for Site 5093, except for the flush cutting of *koa haole* trees that are in the area. The site is located on a promontory that contains relatively thin soil deposits. It may be possible—over time—to encourage drought tolerant native plants such as *'ilima* (*Sida fallax*) in the site preservation area.

5. A c. 15 meter (50 foot) preservation area buffer around the perimeter of this site.

Site 5094 (refer to Figure 5)

1. No formal access is proposed due to the limited interpretive value of this site.

2. A sign will be placed on this site to help identify the site and ensure its long-term integrity. The sign should be placed on the southeastern side of Site 5094. Text and graphics should relay basic information revealed from archaeological testing of the feature (i.e., age and function).

3. No landscaping recommendations are proposed at this time other than the removal of *koa haole* trees within the site preservation area. Trees will need to be flush cut, in order to avoid negative impacts to the site.

4. A preservation area buffer of c. 5 meters (15 feet) will be established for this site.

Site 5095 (refer to Figure 6)

1. This site consists of a remnant of the Old Government Road and an associated retaining wall that crosses a portion of the project area. This site consists of the old road cut and a dry laid retaining wall. The intact portion of the road cut extends some 60 meters NNE/SSW by 35 meters WNW/ESE and measures c. 7.5 meters in width. Passive, "as is" preservation is recommended for a portion of this site.

2. No signage is proposed for this site to help identify it at this time, because it lies near Honoapi'ilani Road and can not be developed.

3. No landscaping recommendations are proposed at this time other than the possible removal of *kiawe* trees within the site preservation area. Trees will need to be flush cut, in the event that they are removed.

4. A buffer of c. 5 meters (15 feet) will be established around the portion of the site that will be preserved.

Site 5097 (refer to Figure 7)

1. This site consists of 2 rock overhang shelters that lie within c. 35 meters of the shore. Previous land clearing activities associated with Honoapi'ilani Road improvements appear to have impacted the area at the top of the ridge above the site. These overhang features are situated within 5 meters of one another below this disturbed area. Passive, "as is" preservation is recommended for this site.

2. No signage is proposed for this site to help identify it at this time, because it lies in close proximity to a popular beach area.

3. No landscaping actions are proposed for Site 5097 at this time.

4. A buffer of c. 5 meters (15 feet) will be established around the site.

Site 5007 (refer to Figure 8)

1. Site 5007 consists of an "L-shaped" modified outcrop that forms a partial enclosure. The open portion of this enclosure faces the nearby ocean. It appears possible that fishermen have utilized the structure as a shelter. Passive, "as is" preservation is recommended for this site.

2. No signage is proposed for this site because of its isolated location. Site 5006, located to the southwest, has been vandalized by bottle hunters, and it is felt that signage could draw unwanted attention to Site 5007.

3. No landscaping recommendations are proposed at this time.

4. A preservation buffer of c. 10 meters (30 feet) will be established.

Perpetual Maintenance and Access

While it is anticipated that the preservation areas of several of the sites discussed in this plan will not have any maintenance requirements, two of the sites located on Kalaepiha Point should have some maintenance. The preservation areas of Site 5093 and 5094 will be maintained by the property owner(s) and/or its assignee. Precautions against unnecessary intrusions at all of the above site preservation areas will be the responsibility of the property owner(s) or its assignee. The preservation areas shall be generally cleared by hand. However, hand-held weed eaters may be used when necessary. Access to the Site 5093 preservation area for traditional cultural practices will need to be coordinated with the property owner(s) or its assignee with a 7 day notice. Suggested times for traditional access to Site 5093 are from 10:00 a.m. to sunset.

Signage

Signage is recommended for Site 5093 (a paved enclosure with associated access trail and probable fish-spotting station), and Site 5094 (a remnant of a possible habitation area).

For Site 5093 signage will be placed in the *mauka* or southeastern portion of the preservation area (Figure 3). The text and graphics will relay information revealed from archaeological testing of the feature (i.e., age and function). It is important to note that signs will deteriorate over time and, consequently, should be periodically replaced.

While Site 5093 is in generally fair condition, possible partial restoration may be undertaken by the property owner at some future date. However, any potential restoration activities must first be reviewed and approved by the State Historic Preservation Division (Maui contact phone: 243-5169), before any action can be undertaken. At this point in time, passive "as is" preservation with some signage is proposed. As noted earlier, access should be allowed for traditional purposes. The proposed heading and text of this sign are as follows:

a. **Heading of Site 5093 sign:**

Site 5093
A Pre-European Contact Hawaiian Ceremonial Area
Honolua *ahupua'a*, Lahaina District,
Island of Maui

b. **Text of sign** (A brown background with black lettering is recommended):

"This site on Kalaepiha Point is a Native Hawaiian site. "Site 5093 has traditional cultural value. Please respect it. Damage to this site is punishable under Chapter 6E-11, Hawaii Revised Statutes"

c. **Size of sign:**

The recommended size for the Site 5093 sign is 1.5-ft. (0.45 m.) by 1-ft. (0.3 m.).

a. **Heading of Site 5094 sign:**

Site 5094
A possible precontact habitation site remnant.
Honolua *ahupua'a*, Lahaina District,
Island of Maui

b. **Text of sign** (A brown background with black lettering is recommended):

"This site remnant is a native Hawaiian archaeological site. Please respect it. Damage to this site is punishable under Chapter 6E-11, Hawaii Revised Statutes"

c **Size of sign:**

The recommended size for the Site 5094 sign is 1.5-ft. (0.45 m.) by 1-ft. (0.3 m.).

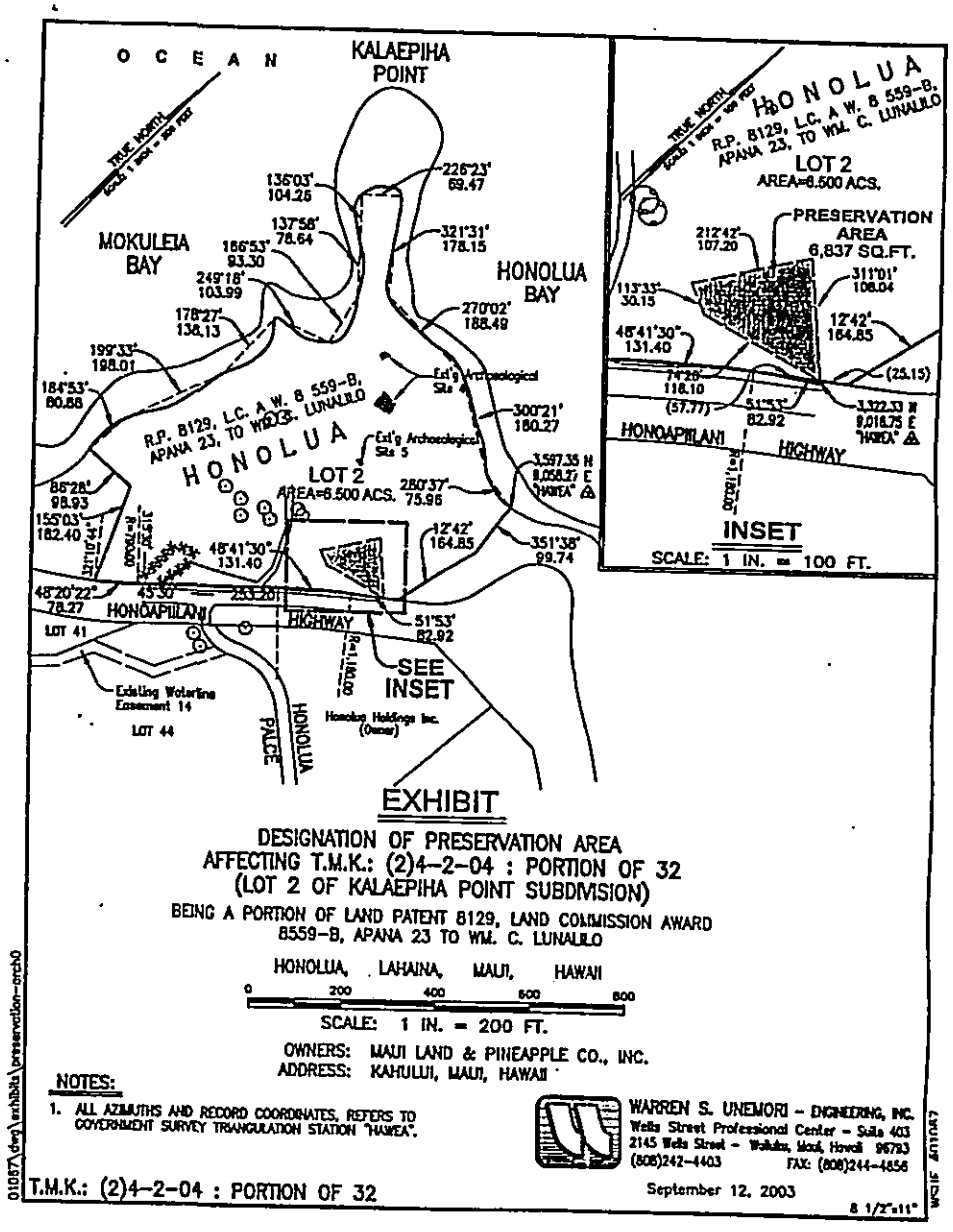
SUMMARY AND CONCLUSIONS

As noted earlier in this document, five sites are discussed in this report. These sites retain their significance assessments. Passive in-place preservation is recommended for Sites 5007, 5093, 5094, 5095, 5097 and 5007. Most of these sites are located in areas that pose relatively few preservation problems. The integrity of Site 5094 has been altered by previous land clearing activities, and additional work in the form of data recovery is recommended if in-place preservation is not feasible for this site remnant.

At the writing of this plan, no signs are proposed for the Site 5095, Site 5097, and Site 5007 preservation areas.

APPENDIX A

Site 5095 Preservation Area Information



Kalaepiha Point Subdivision
Description of Preservation Area

A Preservation Area, over and across a portion of Land Patent 8129, Land Commission Award 8559-B, Apana 23 to Wm. C. Lunalilo (portion of Lot 2 of Kalaepiha Point Subdivision) at Honolua, Lahaina, Maui, Hawaii and being more particularly described as follows:

Beginning at a point at the most easterly corner of this area, the azimuth and distance from the northeasterly corner of Lot 2 and the southeasterly corner of Lot 3 of Kalaepiha Point Subdivision being: 51° 53' 25.15 feet, the coordinates of said point of beginning referred to Government Survey Triangulation Station "HAWEA" being 3,322.33 feet North and 9,016.75 feet East and running by azimuths measured clockwise from True South:

1.	74°	20'	116.10 feet	over and across a portion of Land Patent 8129, Land Commission Award 8559-B, Apana 23 to Wm. C. Lunalilo (portion of Lot 2 of Kalaepiha Point Subdivision);
2.	113°	33'	30.15 feet	over and across same;
3.	212°	42'	107.20 feet	over and across same;
4.	311°	01'	108.04 feet	over and across same to the point of beginning and containing an Area of 6,837 Square Feet, more or less.

Appendix B

Botancial Survey

BOTANICAL SURVEY
MOKULEIA COASTAL LANDS
KAPALUA, LAHAINA DISTRICT, MAUI

by

Winona P. Char
CHAR & ASSOCIATES
Botanical Consultants
Honolulu, Hawai'i

Prepared for: Kapalua Land Development Company, Ltd.

March 2001

BOTANICAL SURVEY
MOKULEIA COASTAL LANDS
KAPALUA, LAHAINA DISTRICT, MAUI

INTRODUCTION

The project site consists of approximately 31 acres of coastal lands, located between the D.T. Fleming Beach County Park and Honolua Gulch (Figure 1).

Field studies to assess the botanical resources on the project site were conducted on 26 January 2001 by a team of two botanists. The primary objectives of the survey were to:

1) provide a general description of the vegetation on the site;
2) inventory the flora;
3) search for threatened and endangered species as well as species of concern; and
4) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

SURVEY METHODS

Prior to undertaking the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Topographic maps and soil maps (with an aerial photobase) were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, drainage, exposure, disturbances, topography, etc. Plant identifications were made in the field; plants which could not be positively identified were collected for later determination in the herbarium, and for comparison with the recent taxonomic literature.

The species recorded are indicative of the season ("rainy" vs. "dry") and the environmental conditions at the time of the survey. A survey taken at a different time of the year and under varying environmental conditions would no doubt yield slight variations in the species list, especially of the weedy, annual plants.

DESCRIPTION OF THE VEGETATION

Much of the parcel is characterized by rocky coastal cliffs, mapped as Rock land, "rRK", on the soil maps (Foote et al. 1972). The seaward facing portions support low windswept coastal cliff vegetation, while the inland areas abutting Honoapi'ilani Highway are covered primarily by ironwood forest. On the Honolua Gulch portion of the project site, the soils are mapped as Stony alluvial land, "rSM". This soil type consists of stones, boulders, and soil deposited by streams along the bottoms of gulches and alluvial fans (Foote et al. 1972). The Honolua Gulch area supports a dense forest composed of a number of introduced tree species.

A more detailed description of the vegetation types follows. An inventory of all the plants observed on the project site during the field studies is presented in the species list at the end of the report.

Coastal Cliff Vegetation

Coastal cliff vegetation is somewhat variable. In some places,

the vegetation consists of windpruned patches of ironwood trees (Casuarina equisetifolia), 3 to 6 feet tall. In other places, low thickets of koa haole (Leucaena leucocephala) are common along with airplant (Kalanchoe pinnata), sourgrass (Digitaria insularis), and Guinea grass (Panicum maximum).

Scattered along the exposed, rocky bluffs are patches of native plants. These include the low, mat-forming type of 'ilima or 'ilima papa (Sida fallax), Fimbristylis cymosa, 'ohelo kai (Lycium sandwicense), Cyperus phleoides, 'akulikuli (Sesuvium portulacastrum), kipukai (Heliotropium curassavicum), pa'uohi'iaka (Jacquemontia ovalifolia subspecies sandwicensis), 'ilie'e (Plumbago zeylanica), and 'ala 'ala wai nui (Pepperomia blanda var. floribunda).

Ironwood Forest

In most places bordering the highway, ironwood trees form large stands, 50 to 60 feet tall. There is usually a deep layer of fallen ironwood "needles" beneath the trees. Along the margins of the trees, where there is more light and a thinner mat of ironwood leaf and branch litter, Guinea grass forms scattered clumps, 3 to 4 feet tall. The more open areas between the stands of ironwood support patches of koa haole shrubs. Other plants found in these more open areas include Christmas berry (Schinus terebinthifolius), sourbush (Pluchea carolinensis), night-blooming cereus (Hylocereus undatus), Natal redtop grass (Melinis repens), Chinese violet (Asystasia gangetica), and Mauritius hemp (Furcraea foetida).

Mixed Forest

This forest, composed exclusively of introduced tree species, occurs on the more or less level floor of Honolua Gulch; the forest is 25 to 50 feet tall. Along the stream which marks the

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boundary of the property, Java plum trees (Syzygium cumini) are abundant. Where the stream nears the ocean, milo trees (Thespesia populnea) become common. Other trees found within the gulch are rose apple (Syzygium jambos), mango (Mangifera indica), kukui (Aleurites moluccana), African tulip tree (Spathodea campanualata), Chinaberry (Melia azedarach), and 'opiuma (Pithecellobium dulce). Shrubs of Christmas berry, noni (Morinda citrifolia), koa haole, kolomona (Senna surattensis), and coffee (Coffea arabica), six to 12 feet tall, are common to abundant. Where the tree canopy cover is open, Guinea grass is the most abundant ground cover. In heavily shaded areas where the tree canopy cover is closed, the ground cover consists of low mats of basket grass (Oplismenus hirtellus). Vines of huehue haole (Passiflora suberosa), a member of the passion fruit family, are locally common.

A stand of large, old monkeypod trees (Samanea saman) is found within the mixed forest vegetation type. Cat's-claw climber (Macfadyena unguis-cati), a rambling, woody vine with tubular yellow flowers, covers the ground with a low, tangled mat; the plants also scramble up the tree trunks and branches. Taro vine (Epipremnum pinnatum) is also frequently encountered.

Remnant ornamental species mark old house sites. These include wandering Jew (Tradescantia zebrina), Cussonia sp., pikake (Jasminum multiflorum), ti (Cordyline fruticosa), fan palm (Livistonia sp.), and a clump of bamboo (Bambusa sp.).

DISCUSSION

Introduced species such as ironwood, koa haole, Guinea grass, Christmas berry, monkeypod, etc., are the dominant components of the three vegetation types recognized on the project site. Introduced or alien species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or

accidentally, after Western contact, that is, Cook's arrival in the islands in 1778. Of a total of 101 species inventoried on the project site, 84 (83%) are introduced, four (4%) are originally of Polynesian introduction, and 13 (13%) are native. Eleven of the native species are indigenous, that is, they are native to the Hawaiian Islands and elsewhere. Two species are endemic, that is, they are native only to the Hawaiian Islands. These are the pa'uohi'iaka vine and the Cyperus phleoides sedge.

None of the plants found during the field studies is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999). Most of the native plants occur on the almost vertical, windswept coastal cliff areas. All of the native plants can be found in similar environmental habitats throughout the islands.

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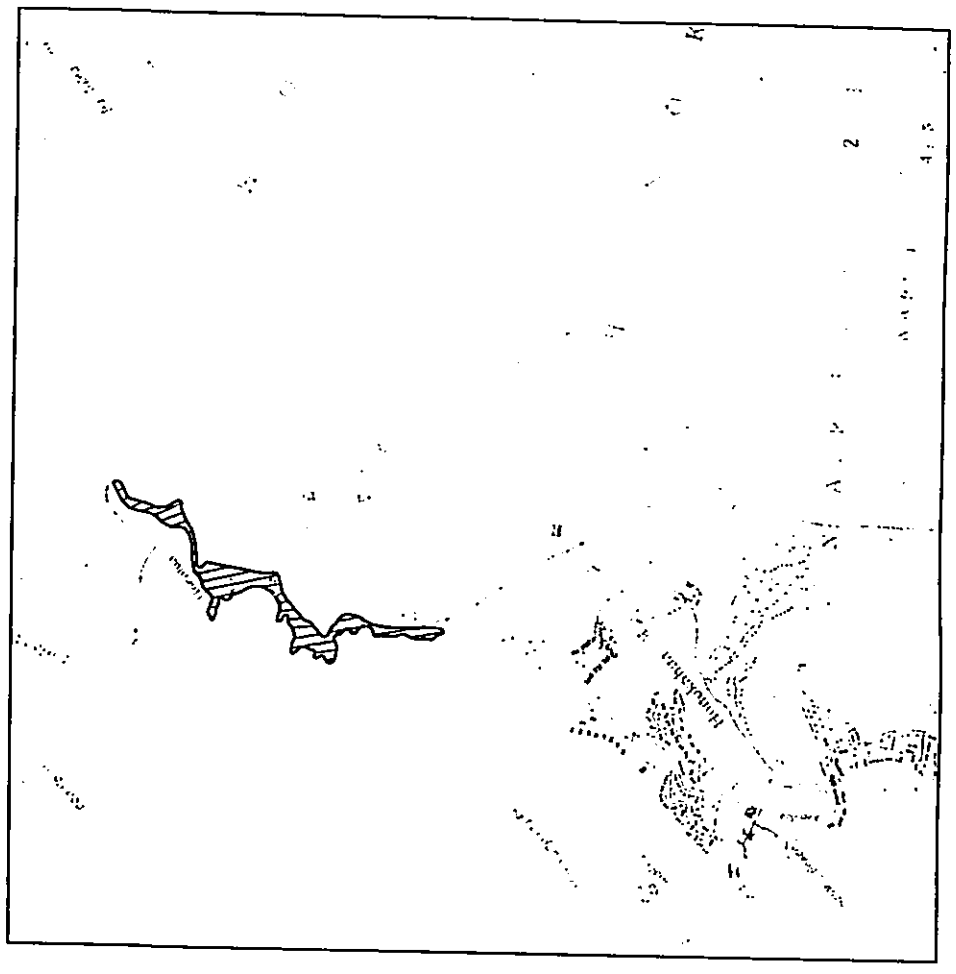

Figure 1
Botanical Survey

PLANT SPECIES LIST -- Mokuleia Coastal Lands

The following checklist is an inventory of all the plants observed on the project site during the field studies. The plant names are arranged alphabetically by families within each of three groups: Ferns, Dicots, and Monocots. The taxonomy and nomenclature of the Ferns follow Lamoureux (1988), while the flowering plants, Dicots and Monocots, are in accordance with Wagner et al. (1990). The few recent name changes for the flowering plants follow those reported in the Hawaii Biological Survey series (Evenhuis and Miller 1995-1998; Evenhuis and Eldredge 1999-2000).

For each species, the following information is provided:

1. Scientific name with author citation.
2. Common English and/or Hawaiian name(s), when known.
3. Biogeographic status. The following symbols are used:
   E = endemic = native only to the Hawaiian Islands.
   I = indigenous = native to the Hawaiian Islands and also elsewhere.
   I? = questionably indigenous = data not clear if dispersal to the islands by natural or human-related mechanisms, but weight of evidence suggests probably indigenous.
   P = Polynesian introduction = plants originally of Polynesian introduction prior to Western contact, that is, Cook's arrival in the islands in 1778.
   P? = questionably a Polynesian introduction = may have been introduced by the Polynesians prior to Western contact or possibly introduced soon after Western contact.
   X = introduced or alien = all those plants brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact.
4. Presence (+) or absence (-) of a particular species within each of three vegetation types recognized on the project site (see text for discussion):

c = Coastal Cliff Vegetation
i = Ironwood Forest
m = Mixed Forest

Scientific name	Common name	Status	Vegetation type c	i	m
ASTERACEAE (Daisy family)					
Ageratum conyzoides L.	maile hohono	X	+	-	-
Bidens pilosa L.	Spanish needle, ki, ki nehe	X	-	+	-
Conyza bonariensis (L.) Cronq.	hairy horseweed, ilioha	X	+	-	-
Pluchea carolinensis (Jacq.) G. Don	sourbush, pluchea	X	+	+	-
Pluchea indica (L.) Less.	Indian pluchea	X	-	+	+
Sonchus oleraceus L.	sowthistle, pualele	X	+	-	-
Synedrella nodiflora (L.) Gaertn.	nodeweed	X	-	-	+
BIGNONIACEAE (Bignonia family)					
Macfadyena unguis-cati (L.) A. Gentry	cat's-claw climber	X	-	-	+
Spathodea campanulata P. Beauv.	African tulip tree	X	-	-	+
BORAGINACEAE (Heliotrope family)					
Heliotropium curassavicum L.	kipukai, nena	I	+	-	-
CACTACEAE (Cactus family)					
Hylocereus undatus (Haw.) Britton & Rose	night-blooming cereus	X	+	+	+
Opuntia ficus-indica (L.) Mill.	panini, papipi	X	+	+	-
CARICACEAE (Papaya family)					
Carica papaya L.	papaya, mikana	X	-	-	+
CASUARINACEAE (She-oak family)					
Casuarina equisetifolia L.	ironwood, paina	X	+	+	-
CHENOPODIACEAE (Goosefoot family)					
Atriplex semibaccata R. Br.	Australian saltbush	X	+	+	-
Chenopodium murale L.	'aheahea	X	+	+	-
CONVOLVULACEAE (Morning glory family)					
Ipomoea indica (J. Burm.) Merr.	koali 'awa, koali 'awahia	I	-	+	+
Ipomoea ochracea (Lindl.) G. Don		X	-	+	-
Jacquemontia ovalifolia ssp. sandwicensis (A. Gray) K. Robertson	pa'uohi'iaka	E	+	-	-

Scientific name	Common name	Status	Vegetation type c	i	m
FERNS					
ADIANTACEAE (Maidenhair fern family)					
Adiantum hispidulum Sw.	Australian maidenhair	X	-	-	+
NEPHROLEPIDACEAE (Swordfern family)					
Nephrolepis multiflora (Roxb.) Jarrett ex Morton	hairy swordfern, 'okupukupu	X	-	+	-
POLYPODIACEAE (Common fern family)					
Phymatosorus scolopendria (Burm.) Pic.-Ser.	laua'e, lauwa'e	X	-	-	+
THELYPTERIDACEAE (Wood-fern family)					
Christella parasitica (L.) Levl.	wood-fern	X	-	-	+
FLOWERING PLANTS					
DICOTS					
ACANTHACEAE (Acanthus family)					
Asystasia gangetica (L.) T. Anderson	Chinese violet, coromandel	X	-	+	+
Justicia betonica L.	white shrimp plant	X	-	-	+
Thunbergia fragrans Roxb.		X	-	-	+
AIZOACEAE (Fir-marigold family)					
Sesuvium portulacastrum (L.) L.	'akulikuli	I	+	-	-
Tetragonia tetragonioides (Pall.) Kuntze	New Zealand spinach	X	+	+	-
ANACARDIACEAE (Mango family)					
Mangifera indica L.	mango, manako	X	-	-	+
Schinus terebinthifolius Raddi	Christmas berry	X	+	+	+
ARALIACEAE (Ginseng family)					
Cussonia sp. (?)		X	-	-	+
Schefflera actinophylla (Endl.) Harms	octopus tree, umbrella tree	X	-	-	+

Scientific name	Common name	Status	Vegetation type c	i	m
MELIACEAE (Mahogany family)					
Melia azedarach L.	Chinaberry, pride-of-India, 'inia	X	-	-	+
MORACEAE (Mulberry family)					
Ficus microcarpa L.f.	Chinese banyan	X	-	-	+
MYRSINACEAE (Myrsine family)					
Ardisia elliptica Thunb.	shoe button ardisia	X	-	-	+
MYRTACEAE (Myrtle family)					
Eucalyptus sp.	eucalyptus, gum tree, 'eukalikia	X	-	+	-
Psidium guajava L.	common guava, kuawa	X	-	-	+
Syzygium cumini (L.) Skeels	Java plum	X	-	-	+
Syzygium jambos (L.) Alston	rose apple, 'ohi'a loke	X	-	-	+
NYCTAGINACEAE (Four-o'clock family)					
Mirabilis jalapa L.	four-o'clock, marvel of Peru, nani ahiahi	X	-	-	+
OLEACEAE (Olive family)					
Jasminum multiflorum (Burm. f.) Andr.	star jasmine, pikake	X	-	-	+
OXALIDACEAE (Wood sorrel family)					
Oxalis corniculata L.	yellow wood sorrel, 'ihi 'ai	P?	+	-	-
PAPAVERACEAE (Poppy family)					
Argemone mexicana L.	Mexican poppy	X	-	+	-
PASSIFLORACEAE (Passion flower family)					
Passiflora edulis forma flavicarpa Degener	passionfruit, liliko'i	X	-	-	+
Passiflora suberosa L.	huehue haole	X	-	-	+
PIPERACEAE (Pepper family)					
Peperomia blanda var. floribunda (Miq.) H. Huber	'ala 'ala wai nui	I	+	-	-

Scientific name	Common name	Status	Vegetation type c	i	m
CRASSULACEAE (Orpine family)					
Kalanchoe pinnata (Lam.) Pers.	air plant, life plant, 'oliwa ku kahakai	X	+	-	-
CUCURBITACEAE (Gourd family)					
Momordica charantia L.	wild bittermelon	X	-	+	-
EUPHORBIACEAE (Spurge family)					
Aleurites moluccana (L.) Willd.	kukui, tutui	P	-	+	+
Chamaesyce hirta (L.) Millsp.	hairy spurge, garden spurge	X	-	+	-
Chamaesyce hypericifolia (L.) Millsp.	graceful spurge	X	-	-	+
Phyllanthus debilis Klein ex Willd.	niruri	X	+	-	-
FABACEAE (Pea family)					
Acacia confusa Merr.	Formosan koa	X	-	-	+
Canavalia cathartica Thouars	maunaloa	X	-	-	+
Desmanthus pernambucanus (L.) Thellung	slender mimosa	X	-	+	-
Desmodium incanum DC	Spanish clover, ka'imi	X	-	-	+
Leucaena leucocephala (Lam.) de Wit	koa haole	X	+	+	+
Neonotonia wightii (Wight & Arn.) Lackey		X	-	+	-
Pithecellobium dulce (Roxb.) Benth.	'opiuma	X	-	-	+
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	kiawe	X	-	+	-
Samanea saman (Jacq.) Merr.	monkeypod	X	-	-	+
Senna surattensis (N.L. Burm.) H. Irwin & Barneby	kolomona, kalamona	X	-	-	+
LAURACEAE (Laurel family)					
Cinnamomum burmannii (Nees) Blume	Padang cassia, cinnamon	X	-	-	+
MALVACEAE (Mallow family)					
Abutilon grandifolium (Willd.) Sweet	hairy abutilon, ma'o	X	-	-	+
Malvastrum coromandelianum (L.) Garcke	false mallow, hauuoi	X	-	-	+
Sida fallax Walp.	'ilima, 'ilima papa	I	+	-	-
Thespesia populnea (L.) Sol. ex Correa	milo	I?	-	+	+

Scientific name	Common name	Status	Vegetation type c	i	m
ARECACEAE (Palm family)					
Livistonia sp.	fan palm	X	-	-	+
Phoenix sp.	date palm	X	-	-	+
Roystonea sp.	royal palm	X	-	-	+
COMMELINACEAE (Spiderwort family)					
Tradescantia zebrina Bosse	wandering Jew	X	-	-	+
CYPERACEAE (Sedge family)					
Cyperus phleoides (Nees ex Kunth) Hillebr.		E	+	-	-
Fimbristylis cymosa R. Br.		I	+	-	-
LILIACEAE (Lily family)					
Aloe vera L.	aloe	X	-	+	-
POACEAE (Grass family)					
Bambusa sp.	bamboo	X	-	-	+
Chloris barbata (L.) Sw.	swollen fingergrass, mau'ulei	X	+	+	-
Coix lachryma-jobi L.	Job's tears	X	-	-	+
Cynodon dactylon (L.) Pers.	Bermuda grass, manienie	X	+	-	-
Digitaria ciliaris (Retz.) Koeler	Henry's crabgrass	X	+	-	-
Digitaria insularis (L.) Mez ex Ekman	sourgrass	X	+	+	-
Eleusine indica (L.) Gaertn.	wiregrass, manienie ali'i	X	-	+	-
Melinis repens (Willd.) Zizka	Natal redtop, Natal grass	X	-	+	-
Oplismenus hirtellus (L.) P. Beauv.	basket grass, honohono kukui	X	-	-	+
Panicum maximum Jacq.	Guinea grass	X	+	+	+
Sporobolus indicus (L.) R. Br.	Indian dropseed	X	+	-	-

Scientific name	Common name	Status	Vegetation type c	i	m
PLUMBAGINACEAE (Leadwort family)					
Plumbago zeylanica L.	'ilie'e, hilie'e	I	+	-	-
PORTULACACEAE (Purslane family)					
Portulaca oleracea L.	common purslane, pigweed, 'ihi	X	+	-	-
PRIMULACEAE (Primrose family)					
Anagallis arvensis L.	scarlet pimpernel	X	+	-	-
RUBIACEAE (Coffee family)					
Coffea arabica L.	coffee	X	-	-	+
Morinda citrifolia L.	noni	P	-	-	+
Paederia foetida L.	maile-pilau	X	-	-	+
SOLANACEAE (Nightshade family)					
Capsicum frutescens L.	chili pepper, nioi	X	-	-	+
Lycium sandwicense A. Gray	'ohelo kai, 'ae'ae	I	+	-	-
Solanum americanum Mill.	glossy nightshade, popolo	I?	-	+	-
Solanum seaforthianum Andr.	blue potato vine	X	-	-	+
STERCULIACEAE (Cacao family)					
Waltheria indica L.	'uhaloa, hi'aloa, kanakaloa	I?	+	-	-
VERBENACEAE (Verbena family)					
Lantana camara L.	lantana, lakana	X	-	-	+
Stachytarpheta jamaicensis (L.) Vahl.	Jamaica vervain, owi, oi	X	+	-	-
MONOCOTS					
AGAVACEAE (Agave family)					
Cordyline fruticosa (L.) A. Chev.	ti, ki	P	-	-	+
Furcraea foetida (L.) Haw.	Mauritius hemp	X	-	+	-
ARACEAE (Aroid family)					
Epipremnum pinnatum (L.) Engl	taro vine, pothos, golden pothos	X	-	-	+

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13 August 2001

PBR Hawaii
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1001 Bishop Street
Honolulu, Hawaii 96813-3429

Attention: Tom Schnell

SUBJECT Mokuleia Coastal Lands

Dear Mr. Schnell:

A portion of the Mokuleia Coastal Lands was not included in the original assessment report (Char 2001). This is the area identified as "AeC", Alaeloa silty clay, 7 to 15% slopes, on the soil maps (Foote et al. 1972). It is a relatively level area with fairly deep, well-drained soils located behind the point situated between Makuleia Bay and Honolua Bay.

Much of this area is open and grassy, and appears to have been disturbed in the past; it may have been used as a house site or grazed. The vegetation consists of dense clumps of Guinea grass (Panicum maximum), 3 to 4 ft. tall, with scattered smaller stands of ironwood (Casuarina equisetifolia) and koa haole shrubs (Leucaena leucocephala). Also occurring in this area in smaller numbers are the Mexican poppy (Argemone mexicana), Neonotonia wightii -- a common fodder legume, and Natal redtop grass (Melinis repens).

No threatened and endangered species or species of concern (U.S. Fish and Wildlife Service 1999) were found on this area.

Please do not hesitate to call me should you have any questions regarding the findings.

Sincerely,

Winona P. Char

References

Char, W.P. (Char & Associates). 2001. Botanical Survey, Mokuleia Coastal Lands, Kapalua, Lahaina District, Maui. Prepared for Kapalua Land Development Company, Ltd. March 2001.

Foote, D.E., E.L. Hill, S. Nakamura, and F. Stephens. 1972. Soil survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C.

U.S. Fish and Wildlife Service. 1999. U.S. Fish and Wildlife Service species list, plants. March 23, 1999. Pacific Islands Ecoregion Office, Honolulu, HI.

Appendix C

Avifaunal and Feral Mammal Survey

AVIFAUNAL AND FERAL MAMMAL SURVEY

MOKULEIA COASTAL LANDS, MAUI

Prepared for:

Kapalua Land Company, Ltd.

Prepared by:

Phil Bruner
Environmental Consultant
Faunal (Bird and Mammal) Surveys
Box 1775
BYU-H
Laie, Hawaii 96762

Revised
18 April 2001

INTRODUCTION

The purpose of this report is to present the findings of a field survey at a 23 acre site called Mokuleia Coastal Lands located at Kapalua, Maui (Fig. 1). Published and unpublished resources are also noted to supplement the results of the field survey. The purpose of the field survey was:

1- To document the species of birds and mammals currently on or near the site.

2- To note the various habitats available to birds and mammals at this location.

3- To record any natural resources important to native and migratory species.

GENERAL SITE DESCRIPTION

The 23 acre site designated as Mokuleia Coastal Lands is a narrow property located between the highway and the shoreline. The topography of much of the site is steep. Introduced vegetation composed of Ironwood (*Casuarina equisetifolia*), Christmas Berry (*Schinus terebinthifolius*), Kiawe (*Prosopis pallida*), and Koa Haole (*Leucaena leucocephala*) dominate the property. The shoreline fronting the parcel contains both rocky and sandy beaches.

METHODS OF SURVEY

The field survey was conducted on parts of 3, 18 March 2001. The area accessible by foot was walked and the cliff faces were viewed from above. All birds and mammals seen were tallied. Observations were taken both early and late in the day when birds were most active. Weather conditions during the survey varied from clear to light rain showers. Winds were light in the morning but brisk later in the day. These conditions did not limit the collection of data. Scientific and common names follows Pratt (1999), Pyle (1997), and Honacki et al. (1982).

RESULTS AND DISCUSSION

NATIVE BIRDS: (Landbirds and Seabirds)

No native birds were tallied on this survey. The location of the site and the available habitats are not appropriate for native landbirds. Seabirds nest at a few protected locations on the main Hawaiian Islands (Hawaii Audubon Society 1993). Predation and human disturbance limit were these birds can breed. This site is too exposed to human activity and predators to support breeding populations of native seabirds.

MIGRATORY BIRDS:

One species of migratory shorebird was recorded on the survey. Three Wandering Tattlers (*Heteroscelus incanus*) were observed foraging along the shoreline. This species is not threatened or endangered and is one of the common winter migrants to Hawaii (Pratt et al. 1987, Hawaii Audubon Society 1993). Other migratory shorebirds that potentially could utilize the shoreline include: Pacific Golden-Plover (*Pluvialis fulva*), Sanderling (*Calidris alba*), and Ruddy Turnstone (*Arenaria interpres*).

INTRODUCED BIRDS:

Twelve species of introduced birds were found on the survey. Table One gives the names of these species and their relative abundance. None are threatened or endangered. Rock Doves (*Columba livia*) were seen landing on the rocky cliffs along the shoreline. This species nests in this type of habitat and perhaps is breeding at this site. These birds are also commonly kept as caged birds. The most abundant species was the House Finch (*Carpodacus mexicanus*). They are frequently associated with Ironwood trees. The relative abundance and the number of species were similar to an earlier survey in this region (Bruner 1989).

MAMMALS:

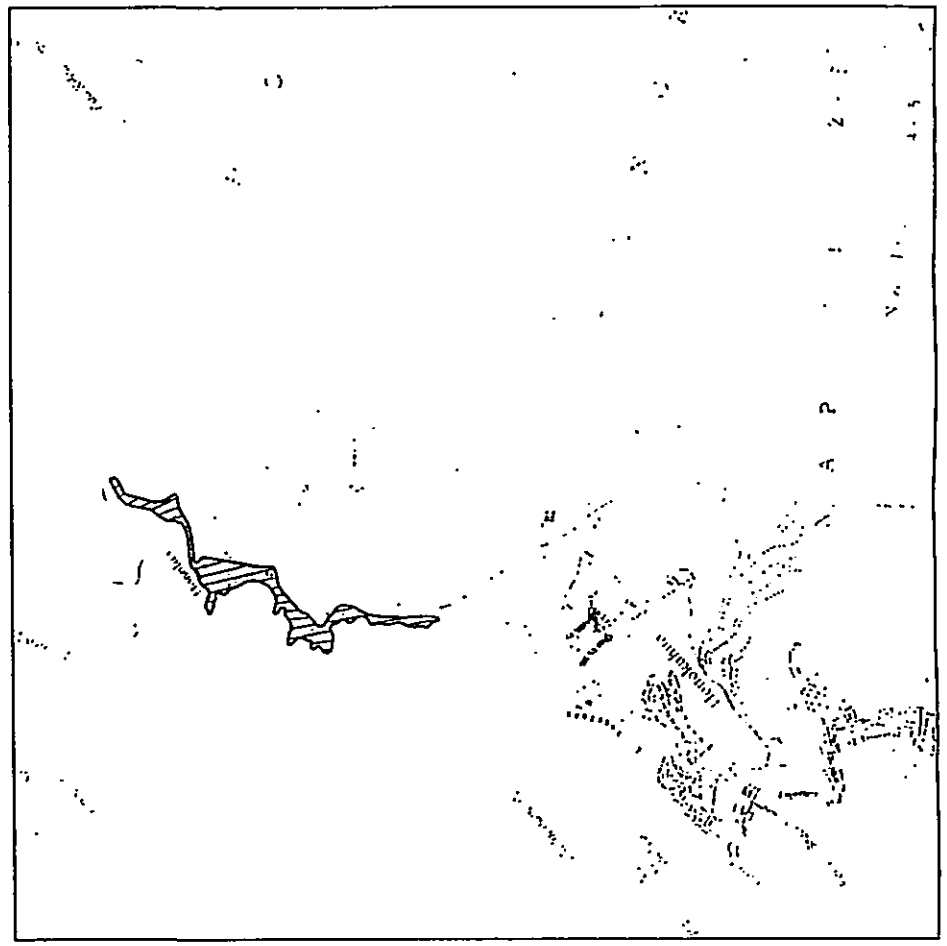
The only two species of mammals recorded were the Small Indian Mongoose (*Herpestes auropunctatus*) and feral Cats (*Felis catus*). Rats (*Rattus spp.*) and mice (*Mus*

musculus) also likely occur at this location. The endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) was not observed. Two evenings were devoted to looking for this species. The Hawaiian Hoary Bat is not common on Maui (Tomich 1986, Kepler and Scott 1990). This species forages in a wide variety of natural and disturbed habitats. They generally roost solitarily in trees. On Kauai and the Big Island they can frequently be seen flying at dusk over bays.

CONCLUSIONS

The survey of this site found the typical array of introduced birds that normally occur in the lowlands on Maui. The presence of the migratory Wandering Tattler was also expected. Other migratory shorebirds probably also use the shoreline for foraging. Seabirds nesting on the main Hawaiian Islands are only successful where predator access can be regulated. This property is too open to predators for seabirds to nest. The native and endangered Hawaiian Hoary Bat was not observed. This is not unusual given its low relative abundance on Maui.

No unique resources important to native landbirds were discovered on the property. This site consists of disturbed second growth vegetation and is easily impacted by human activity.



LEGEND

Survey Area

Source: U.S. Geological Survey

Figure 1
Faunal Survey

0 1,000 2,000
FEET

TABLE 1

Introduced birds recorded at Mokuleia Coastal Lands, Kapalua, Maui. Relative abundance estimates are based on the following scale: Abundant = 25+; Common = 15, 25; Uncommon = 5-14; Rare = less than 5 tallied over the course of the survey.

COMMON NAME	SCIENTIFIC NAME	RELATIVE ABUNDANCE ESTIMATE
Gray Francolin	*Francolinus pondicerianus*	R
Rock Dove	*Columba livia*	U
Spotted Dove	*Streptopelia chinensis*	C
Zebra Dove	*Geopelia striata*	C
Hwamei	*Garrulax canorus*	R
Northern Mockingbird	*Mimus polyglottos*	R
Common Myna	*Acridotheres tristis*	C
Japanese White-eye	*Zosterops japonicus*	C
Northern Cardinal	*Cardinalis cardinalis*	C
Red-crested Cardinal	*Paroaria coronata*	U
House Finch	*Carpodacus mexicanus*	A
Nutmeg Mannikin	*Lonchura punctulata*	U

SOURCES CITED

Bruner, P.L. 1989. Field survey of the avifauna and feral mammals at Kapalua, Maui. Unpubl. ms. Prep. for Belt Collins and Associates. Honolulu.

Hawaii Audubon Society. 1993. Hawaii's Birds. Fourth Edition. Hawaii Audubon Society. Honolulu.

Honacki, J.H., K.E. Kinman and J.W. Koeppl ed. 1982. Mammal species of the World: a taxonomic and geographic reference. Allen Press Inc., and the Association of Systematic Collections. Lawrence, Kansas.

Kepler, C.B., and J.M. Scott. 1990. Notes on the distribution and behavior of the Endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*). 'Elepaio 50(7): 59-64.

Pratt, H.D. 1999. Hawaii's trees and shrubs. Mutual Publishing. Honolulu.

Pratt, H.D., P.L. Bruner and D.G. Berrett. 1987. A field guide to the birds of Hawaii and the tropical Pacific. Princeton University Press. Princeton, New Jersey.

Pyle, R.L.. 1997. Checklist of the birds of Hawaii – 1997. 'Elepaio 57(9): 153-157.

Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press. Honolulu.

Appendix D

Individual Wastewater System Design

WAYNE I. ARAKAKI ENGINEER, LLC
P.O. BOX 884
WAILUKU, HAWAII 96793

Phone No. (808) 242-5868
Fax No. (808) 242-5865

October 13, 2003

Mr. Roland Tejano
Department of Health
Wastewater Branch
54 High Street
Wailuku, Hawaii 96793

Dear Mr. Tejano:

COPY

Re: Individual Wastewater System for

Maui Land & Pineapple Company, Ltd.
1000 Kapalua Drive
Lahaina, HI. 96761

TMK: (2) 4-2-04:32

Submitted for your review and approval is a IWS design for the Maui Land & Pineapple Company, Inc. project which is located in a Conservation Area. The system will consist of one (1) 1250 gallon concrete tank for five bedrooms or bedroom like rooms. We will be using Standard Infiltrators for the leaching field.

Please call me should you have any questions.

Sincerely,

Wayne I. Arakaki, P.E.

INDIVIDUAL WASTEWATER SYSTEM

FOR

Maui Land & Pineapple Company, Inc.

TMK: (2) 4-2-04:32

Date: October 12, 2003

This work has been prepared by me or under my supervision and construction of this project will be under my supervision.

PREPARED BY:

WAYNE I. ARAKAKI ENGINEER, LLC
P.O. BOX 884
WAILUKU, MAUI, HAWAII 96793

INDIVIDUAL WASTEWATER SYSTEM
APPLICATION INFORMATION SHEET
(Please print or type - incomplete forms will result in delayed review)

Engineer: Wayne I. Arakaki Engineer, LLC

Owner: Maui Land & Pineapple Company, Inc.

Owner's Mailing Address (required): Maui Land & Pineapple Company, Inc.
1000 Kapalua Drive
Lahaina, HI. 96761

Contact Person (if different from owner) address and phone number:

Project Location (street address, subdivision name and general area): Kapalua, Hawaii

Project TMK: (2) 4-2-04:32

Lot size: 6.5 Acres +\- (approximate area)

Zoning: Conservation Area

Project Flow or Number of Bedrooms: Five bedroom or bedroom like rooms.
Designed for five bedroom residence.

Proposed Treatment Unit (manufacturer, model, capacity of septic tank, aerobic unit etc.): 1 - 1250 Concrete Tank

Proposed Disposal System: Standard Infiltrators

Percolation Rate: 25.0 min./in.

Existing IWS on the lot. No

FOR DEPARTMENT USE ONLY

Date Received: _____
Project Engineer: _____
File No. _____
Notes: _____

DESIGN CRITERIA

INDIVIDUAL WASTEWATER SYSTEM FOR:

Maui Land & Pineapple Company, Inc.

TMK: (2) 4-2-04:032
Kapalua, Maui

1. LOCATION: Kapalua, Maui, HI.

2. PROJECTED FLOW:

NO. OF BEDROOMS: Designed for five bedrooms.

TOTAL DAILY FLOW: . . .

3. SEPTIC TANK:

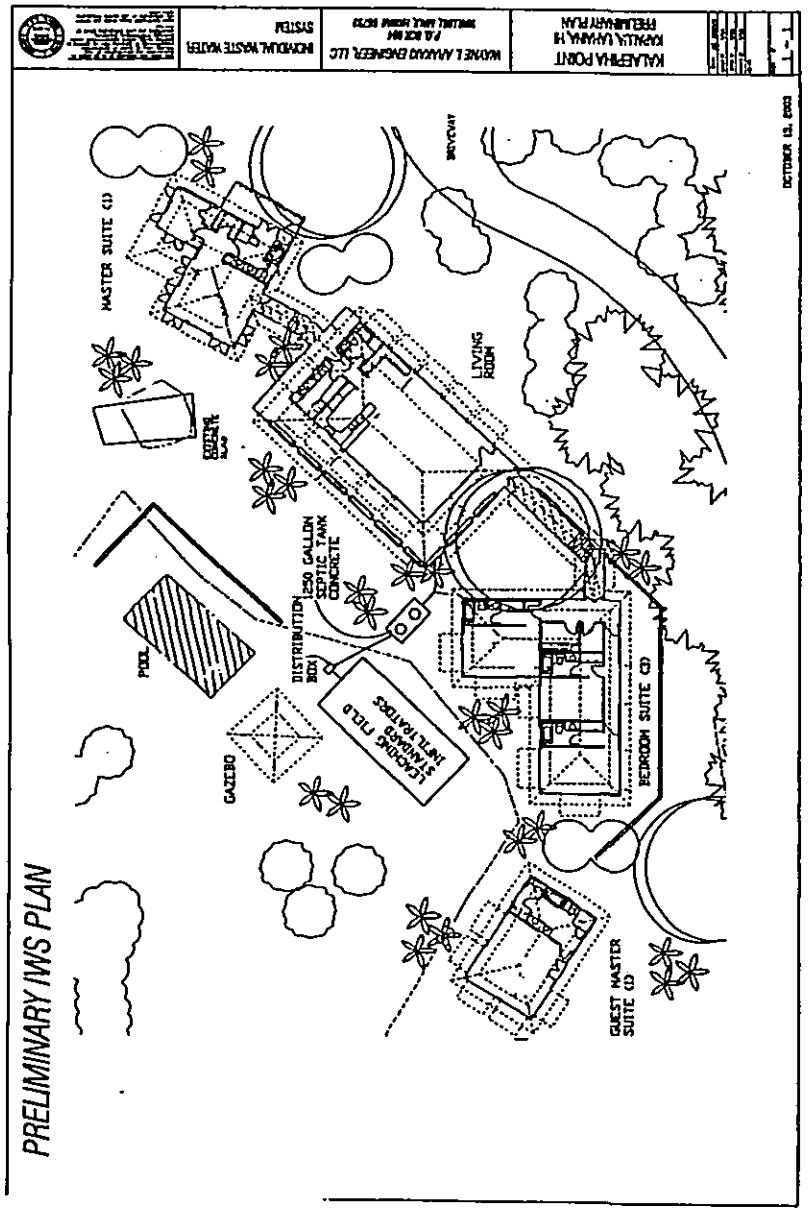
MINIMUM VOLUME: 1 - 1250 gallon septic tank

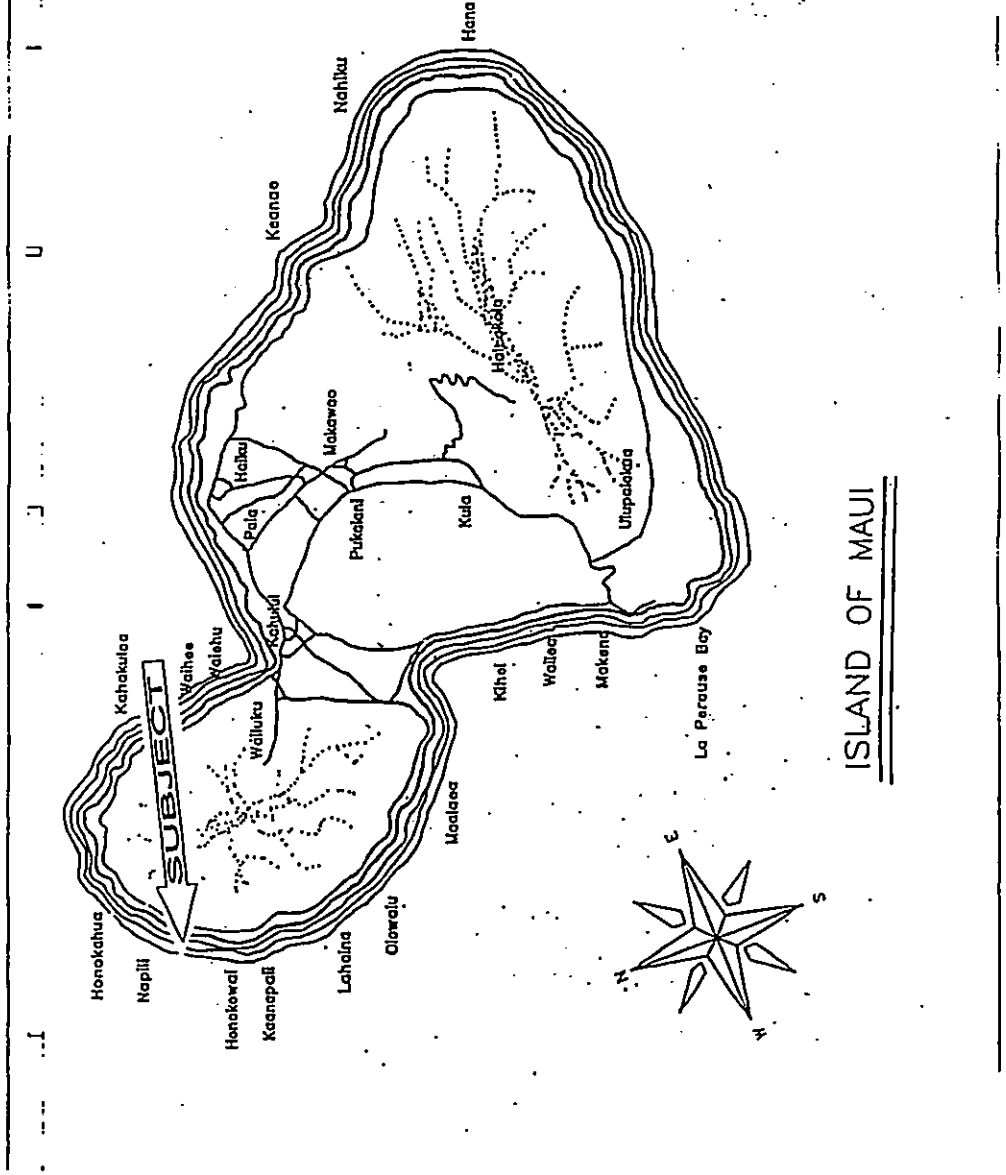
4. DISPOSAL SYSTEM:

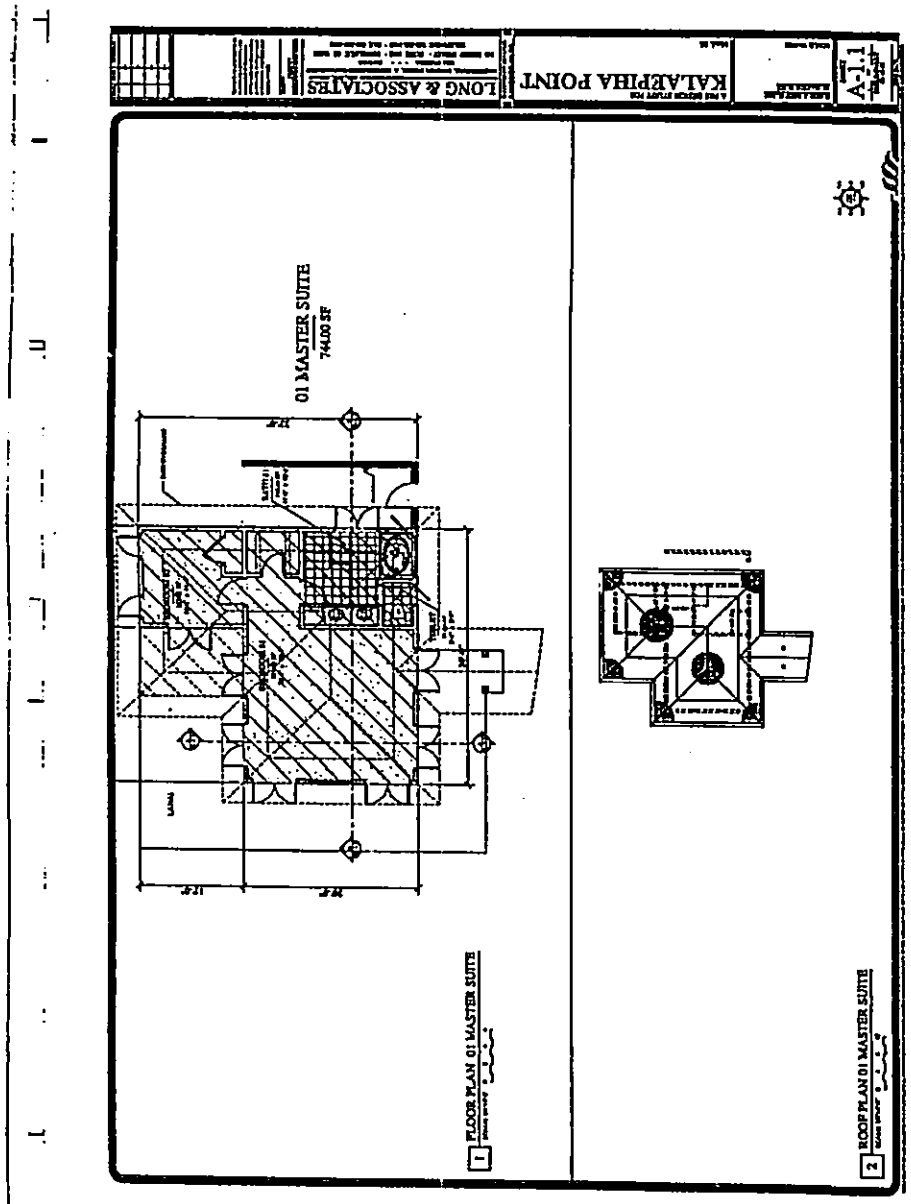
PERCOLATION RATE: 25.00 min./in.

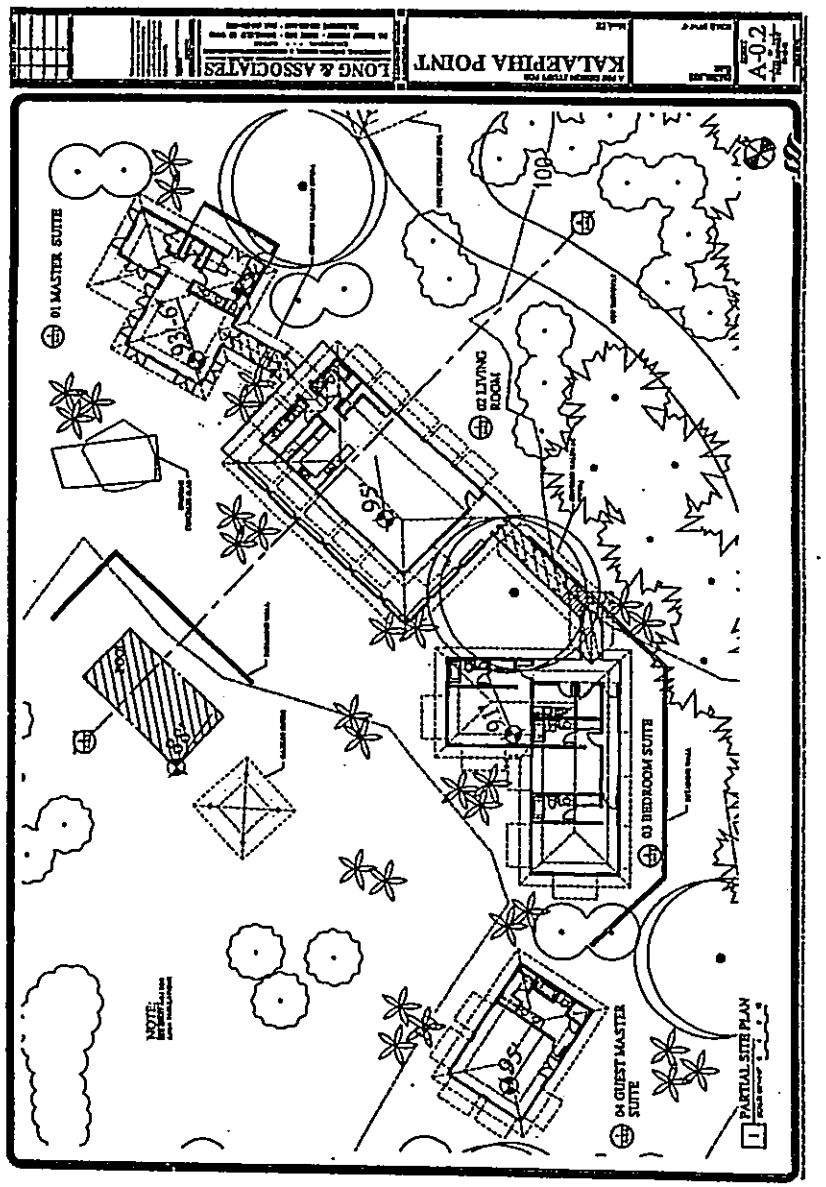
REQUIRED ABSORPTION AREA: 230 x 5 = 1150 sq. ft.

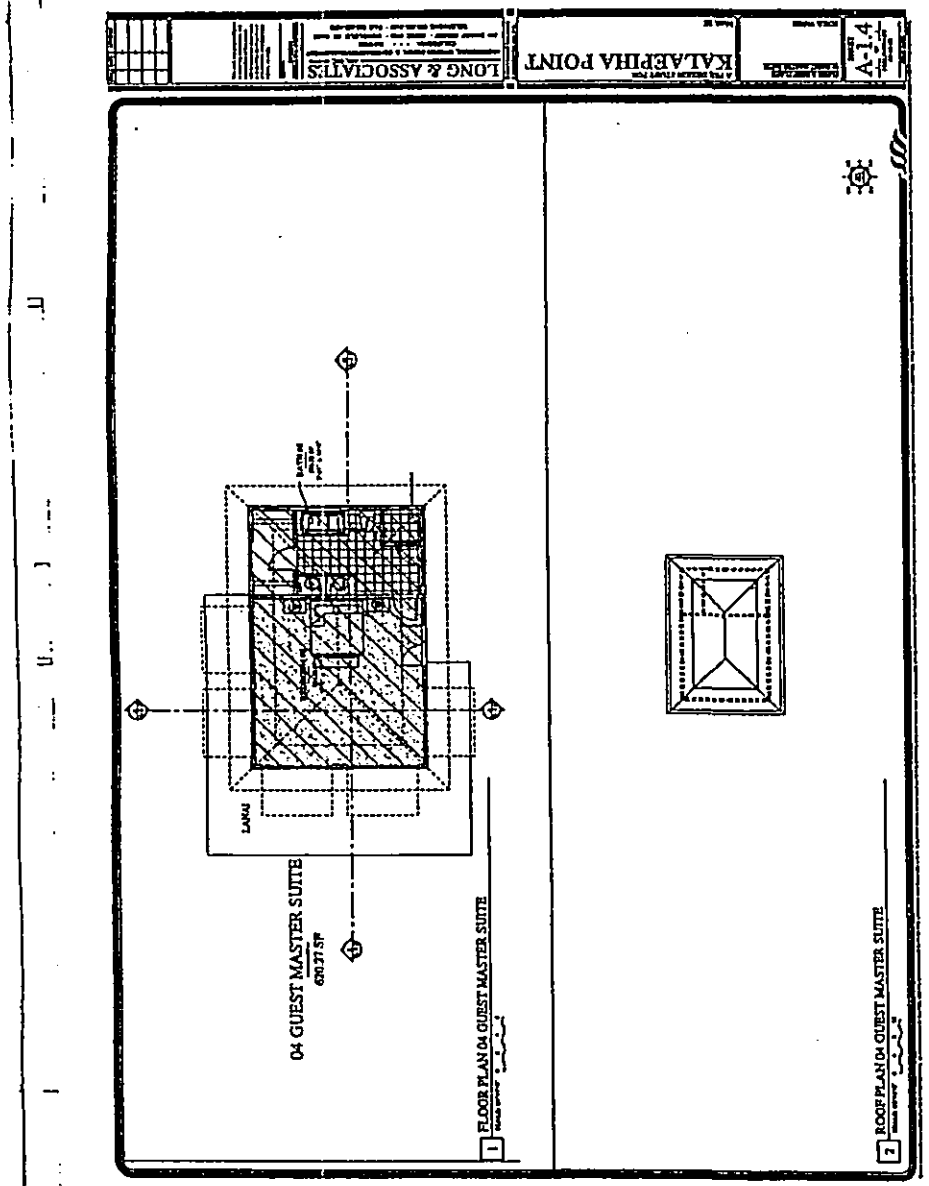
ABSORPTION SYSTEM: The leaching field will be Standard Infiltrators. There will be 6 rows of standard infiltrators. The leaching field will be at a depth of five feet. A filter fabric cloth will be placed over the infiltrators before select backfill is placed. (see attached details) The following calculations are 1150 s.f. x 0.83 = 954.5 s.f. and 954.5/3.0 = 318.16 then 318.16/6 = 53.02 feet or 54 feet long. Each row will be 54 feet long.

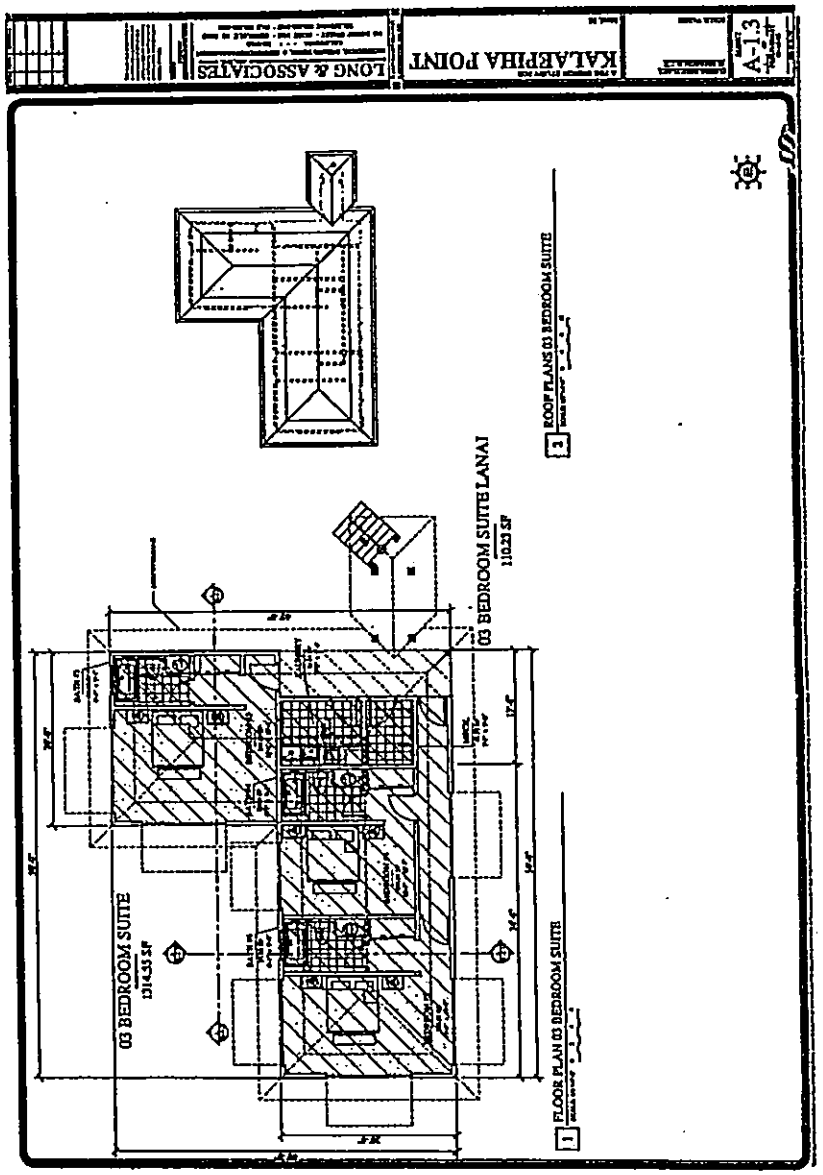


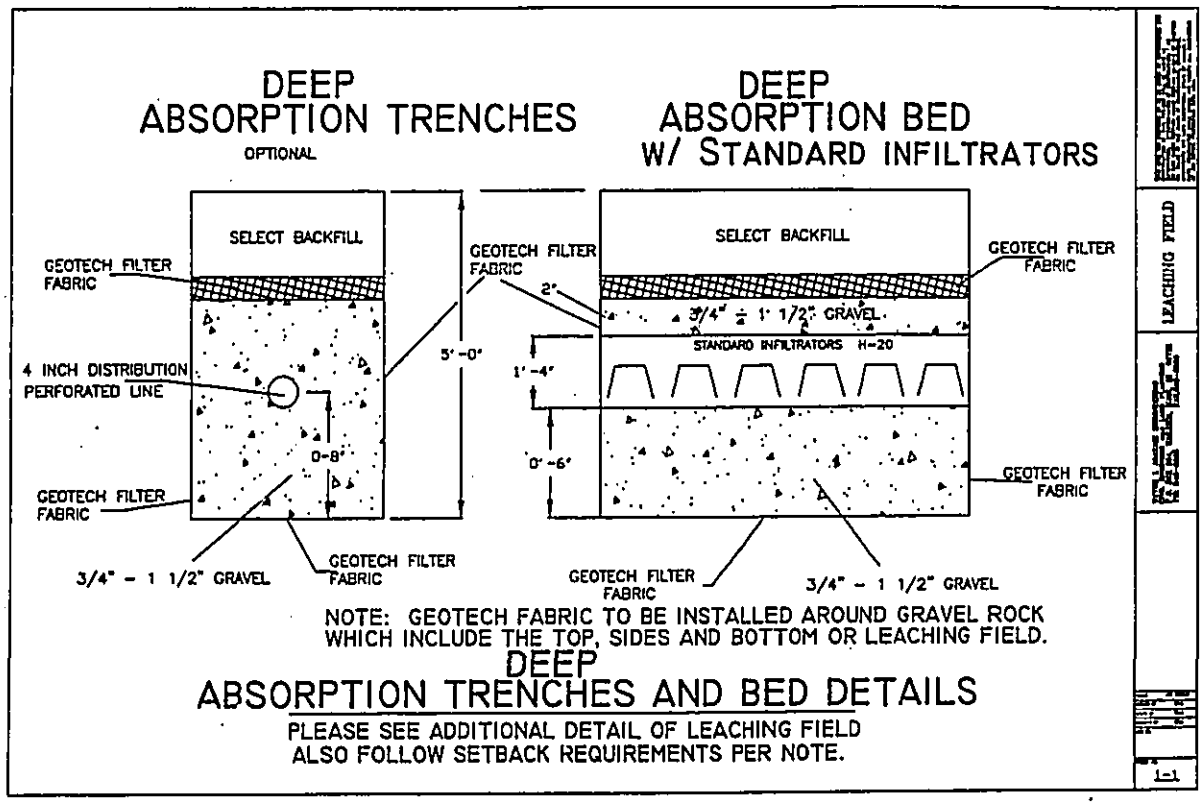


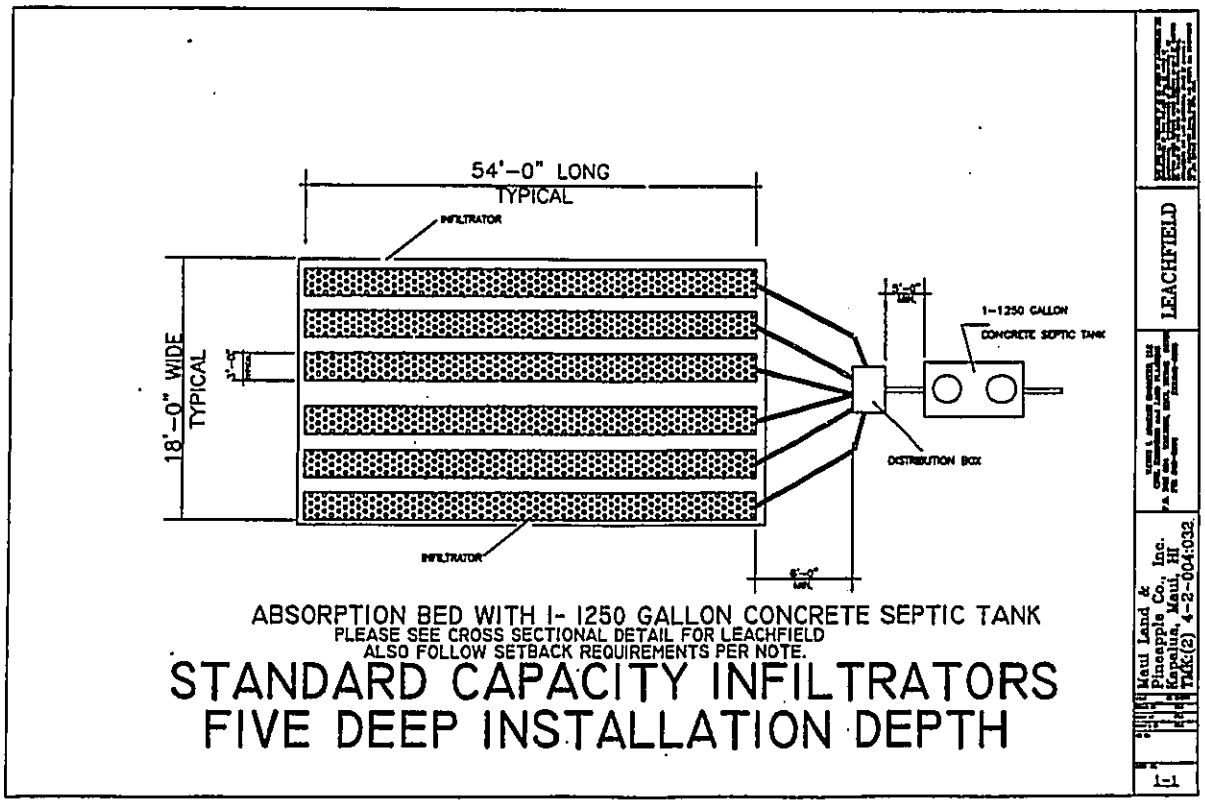






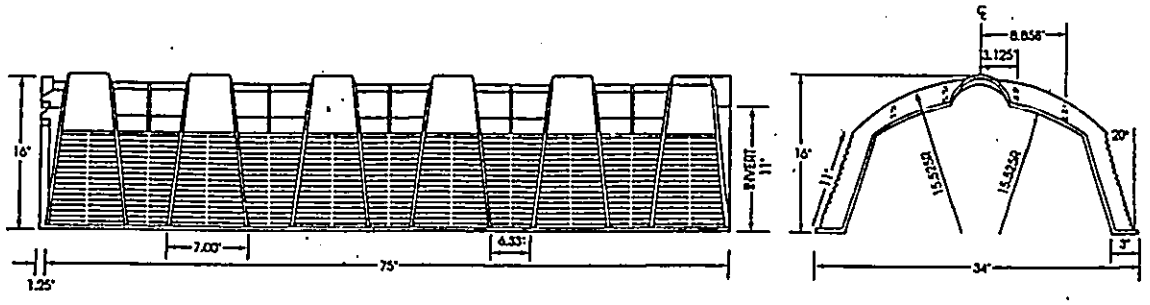






THE HIGH CAPACITY INFILTRATOR® CHAMBER

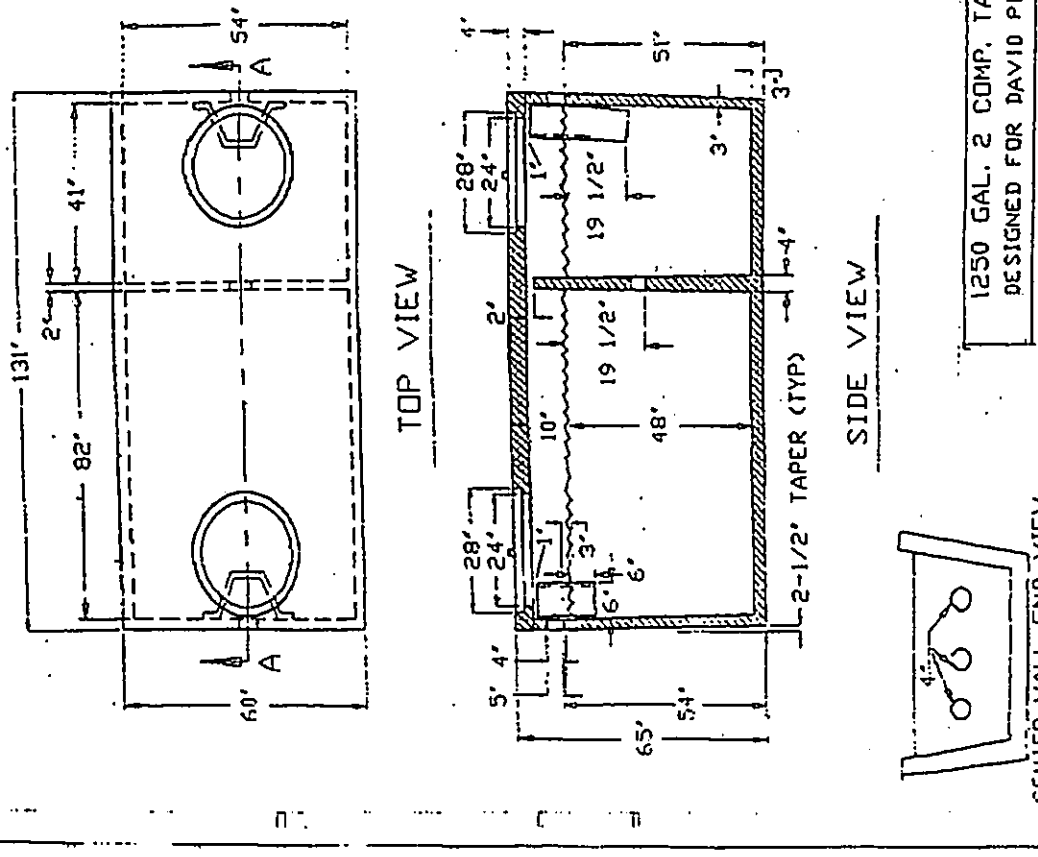
No Scale



SPECIFICATIONS	STANDARD INFILTRATOR®	HIGH CAPACITY INFILTRATOR®
SIZE	3' x 6.25' x 1	3' x 6.25' x 1.33'
WEIGHT	25 lbs.	30 lbs.
STORAGE	10.3 ft³ (77 gal.)	16.3 ft³ (122 gal.)

INFILTRATOR® is a Registered Trademark of Infiltrator Systems, Inc. • 4 Business Park Road • Old Saybrook, CT 06475 • (800) 221-4436 • fax (203) 388-6810

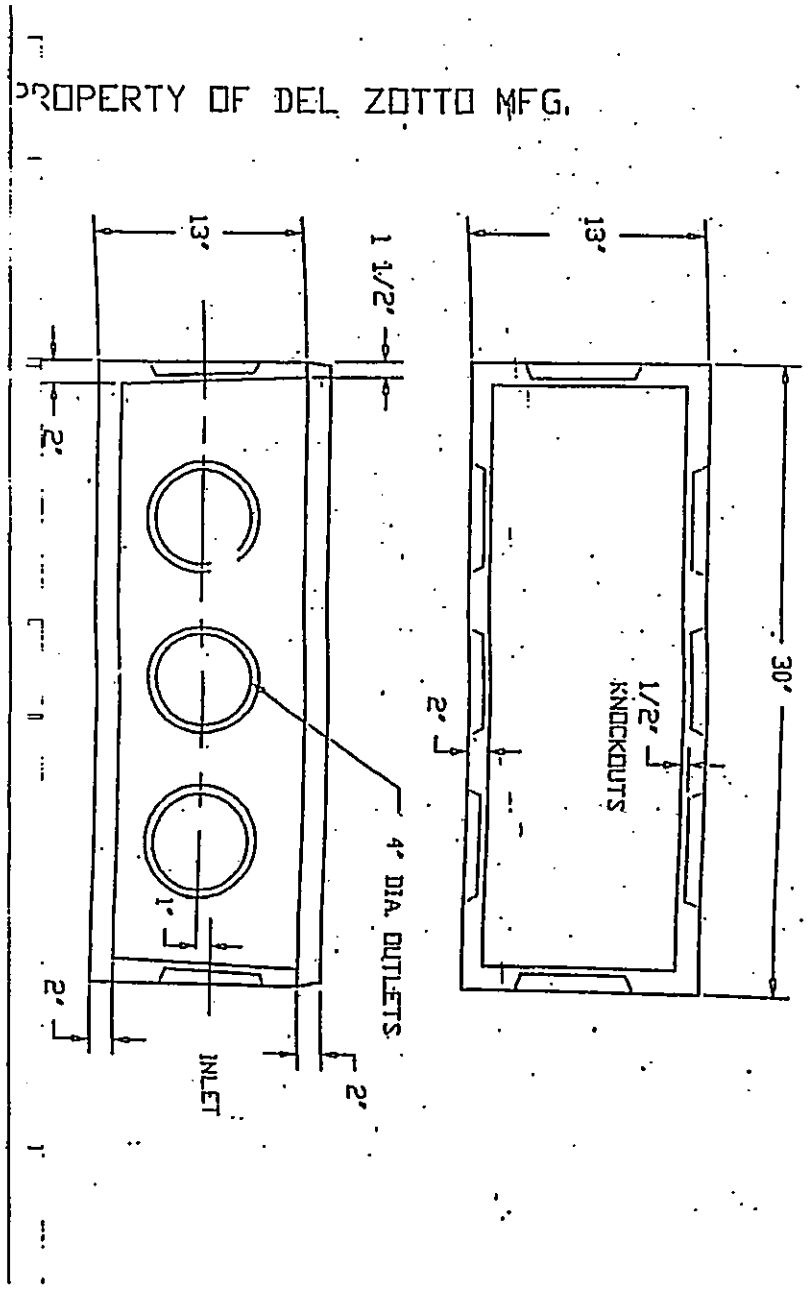
MFG FOR DAVID PICO CESSPOOL DIGGING/WELL DRILLING



1250 GAL. 2 COMP. TANK
DESIGNED FOR DAVID PICO

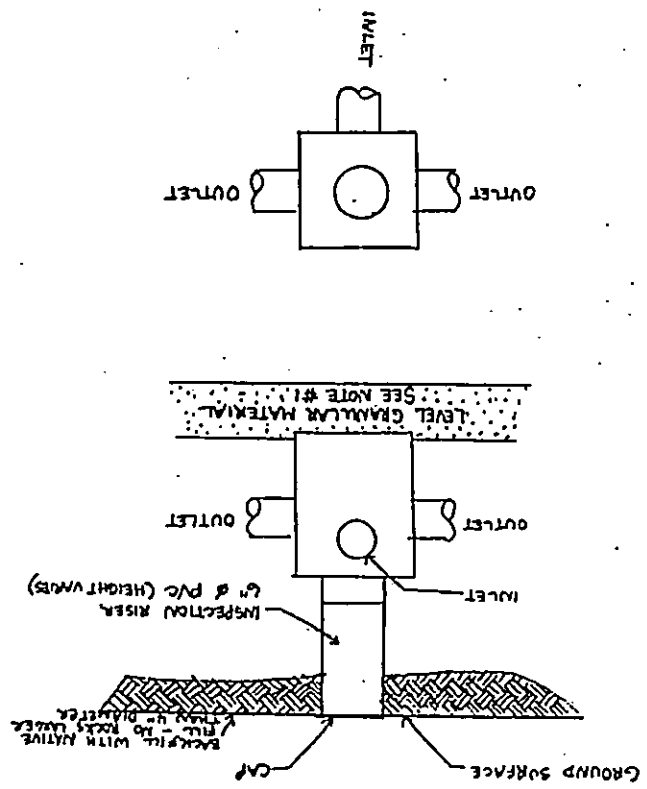
NOTE: THE ENTIRE INTERIOR OF THE SEPTIC TANK IS COATED WITH Xypex OR EQUIVALENT PRODUCT.

PROPERTY OF DEL ZOTTO MFG.



CONSTRUCTION NOTE:

The distribution box shall be set level and arranged so that effluent is evenly distributed to each distribution line.



NOTES:

1. Septic tank and standard infiltrators or absorption bed type leaching field are to be placed not less than 5'-0" from any structure or property line nor less than 10'-0" from any tree which is approximately 4" minimum diameter. Septic system shall also be located not less than 1000' from potable water source and 50 feet from streams.
2. Manholes or inspection ports must be brought to surface grade for maintenance purposes.
3. The depths to pipe inverts of the septic tanks, distribution box, standard infiltrators and absorption bed type leaching field are controlled by topographical features and the invert of the building sewer. This may cause the necessary depths to be greater than the minimum shown. Contractor to verify all elevations and conditions in the field and bring any discrepancies to the attention of the engineer.
4. All bends of the building sewer before the aerobic tank of 90 degrees or greater are to have clean outs that come to the surface.
5. Potable water lines that cross sewer lines must pass 18" minimum above.
6. Contractor shall review individual wastewater report prior to construction. Contractor shall review all details and instruction of the report.
7. Contractor shall retake percolation test in the actual disposal system to verify percolation rate. Engineer should be notified of any change.
8. Contractor to provide insurance certificate, to homeowner. Engineer will not be responsible for damages created due to poor workmanship.
9. All septic systems (IWS) will follow the requirements from the Department's Chapter 11-62, "Wastewater Systems".
10. Septic tank, standard infiltrators or absorption bed type leaching field installed on hillsides, shall be grassed to prevent wastewater from surfacing.

Owner:

Maui Land & Pineapple Company, Inc.
1000 Kapalua Drive
Lahaina, HI. 96761

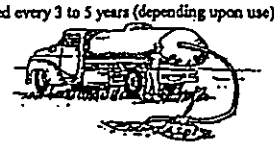
TMK: (2) 4-2-04:32
Kapalua

SEPTIC SYSTEMS

A septic system is the most common method of sewage disposal for homes that have running water but are not near a public sewer line. Properly installed systems will ensure that adequate treatment of the sewage will occur before it mixes with surface or ground waters. Malfunctioning systems can result in disease, odors, and water quality problems.

Septic System Maintenance

A septic tank should be pumped every 3 to 5 years (depending upon use) for optimum functioning.



—PUMP OUT SEPTIC TANK PERIODICALLY—

Do not flush material into the septic tank which may clog the system or may not readily decompose (diapers, cigarette butts, sanitary napkins, etc.) since this will reduce the storage volume.

Reduce the volume of wastewater the system must handle by using less water. Your County Health Department and Extension agent have information on water reduction techniques.

Balance water use throughout the week to keep from overloading the septic system.

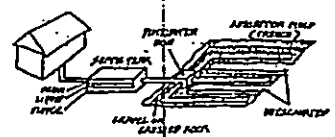
Don't dispose of strong chemicals in a septic system. Excessive amounts of strong chemicals can kill the bacteria that are responsible for decomposing the waste. Normal use of household cleaners and detergents should not cause a problem.

The drainfield area should not be used for a roadway, parking area, traffic area for large animals, or storage area. Such use compact the soil and reduce the capacity of the soil to absorb and treat sewage.

Don't cover the surface of the drainfield with an impermeable substance such as visqueen or cement. This reduces the supply of oxygen to the soil and the soil's evaporation capacity, which will in turn cause improper functioning of the drainfield.

Divert roof drains and stormwater runoff away from the drainfield area. Excess water will reduce the capacity of the drainfield to absorb effluent from the septic tank.

Keep accurate records including diagrams of the location and size of the tank, drainfield, distribution box and pump (if the system has one), as well as dates when the septic tank has been pumped.



Don't drain hottub water to septic systems. They are not designed to handle large volumes of chlorinated water. (Contact your Health Department for suggestions.)

Measuring the Scum Level

This procedure is for determining the distance between the bottom of the scum layer and the bottom of the outlet baffle or tee.

1. Establish a convenient reference point, such as a stick layed on the ground across the hole.
2. Attach a 6 inch square board to the bottom of a stick at least 6 feet long.
3. At the outlet end of your tank's first compartment, carefully push the stick through the scum layer to find the bottom of the baffle or tee.
4. Mark your stick at the reference point to indicate the bottom of the baffle or tee.
5. Raise the stick until you feel or see the stick contact the bottom of the scum layer.
6. Mark your stick again at the reference point to indicate the bottom of the sludge.
7. If the two pencil marks are 3 inches or less apart the tank needs to be pumped out. If the top of the scum is within 1 inch of the top of the outlet baffle the tank needs to be pumped.
8. Lay stick aside for later comparison with sludge level stick.

Measuring the Sludge Level

This procedure is for determining the distance from the bottom of the outlet baffle or tee to the top of the sludge layer.

1. *Wrap 3 feet of a white rag or old toweling around the bottom of a stick at least 6 feet* long and fasten it with tape or string.
2. *Carefully lower the stick to the bottom of the first compartment. To avoid pushing it* through the scum layer, lower the stick behind the outlet baffle or through the outlet tee.
3. Hold the stick in the tank for a few minutes to allow sludge particles to adhere to the towel. Mark the stick at the reference point to indicate the bottom of the tank.
4. Remove the stick carefully and note a distinct dark stain on the towel representing the sludge layer.
5. Lay the stick beside the scum stick. Line up the top pencil marks.
6. Measure the distance from the bottom of the scum stick to the top of the dark stain on the sludge stick.
7. If the distance is 12 inches or less, your tank needs to be pumped.

OPERATIONS AND MAINTENANCE MANUAL
March 1, 1992 (Revised)

1. Septic tanks should be cleaned before too much sludge or scum is allowed to accumulate. Tanks should be inspected by a licensed pumping contractor at least once a year and cleaned when necessary.

2. Wastewater sludge disposal plan. The contents of the septic tank shall be pumped, hauled and then disposed of by a licensed pumping contractor, to a site approved by the State Department of Health.

3. Care should be taken when tank is inspected. The septic tank and seepage pit (if applicable) should be thoroughly ventilated and gases have been removed to prevent explosion hazards or asphyxiation to anyone.

4. Please keep the following out of your septic system, plastic products, rubber products, towels, wash cloths, sanitary napkins, mop strings, grease, lint & disposal diapers. Toilet paper substitutes should not be flushed into a septic tank. Paper towels, newspaper, wrapping paper, rags and sticks may not decompose in the tank, and are likely to lead to clogging of the plumbing and disposal system.

5. Roof drains, foundations drains and drainage from other sources producing *intermittent or constant volumes of clear water should not be piped into the septic* tank or absorption area.

6. The addition of chemicals to a septic tank is not recommended. Use biodegradable detergents whenever possible. Both the soil and essential organisms might be susceptible to large doses of chemicals and disinfectants. Soaps, detergents, bleaches, drain cleaners, or other material, as normally used in the household will have no appreciable adverse effect on the system.

7. Abandoned septic tanks, should be filled with earth or rock.

OWNER'S MANUAL

A major factor influencing the health of individuals where public sewers are not available is the proper disposal of human excreta. Many diseases, such as dysentery, infection hepatitis, typhoid and paratyphoid, and various types of diarrhea are transmitted from one person to another through the fecal contamination of food and water, largely due to the improper disposal of human wastes. For this reason, every effort should be made to prevent such hazards and to dispose of human waste so that no opportunity will exist for contamination of water or food.

Safe disposal of all human domestic wastes is necessary to protect the health of the individual family and the community and to prevent the occurrence of nuisance. To accomplish satisfactory results, such wastes must be disposed of so that:

1. They will not contaminate any drinking water supply.
2. They will not give rise to a public health hazard by being accessible to insects, rodents, or other possible carriers which may come into contact with food or drinking water.
3. They will not give rise a health hazard by being accessible to children.
4. They will not violate laws or regulations governing water pollution or sewage disposal.
5. They will not pollute or contaminate the waters of any bathing beach, shellfish breeding ground, or stream used for public or domestic water supply purposes, or for recreational purposes.
6. They will not give rise to a nuisance due to odor or unsightly appearance.

These criteria can best be met by the discharge of domestic sewage to an adequate public or community sewage system. Where the installation of an individual household sewage disposal system is necessary, the basic principles outlines in this manual on maintenance should be followed. When these criteria are met, and where soil and site conditions are favorable, the septic tank system can be expected to give satisfactory service. Experience has shown that adequate supervision, inspection and maintenance of all features of the system are required to insure compliance in this request. Underground portions of the system should be inspected before being covered, so necessary corrections can be made.

SEPTIC TANK INSPECTION RECORD

Owner's Name: _____

Address: _____

Make and Model of Septic Tank: _____

Material: _____ Capacity: _____

Keeping a good preventive maintenance record will help anticipate when the next cleaning of the septic tank may be needed and avoid major problems arising from poorly maintained wastewater systems.

DATE	SCUM DEPTH	SLUDGE DEPTH	COMMENTS

SITE EVALUATION/PERCOLATION TEST

Date/Time: October 2, 2003

Test performed by: Wayne I. Arakaki

Owner: Maui Land & Pineapple Company, Inc.

Tax Map Key: (2) 4-2-04:32

Elevation: 120 +/- ft
Depth to Groundwater Table: greater 50 ft below grade
Depth to Bedrock (if observed): _____ ft below grade
Diameter of Hole: 12 in
Depth to Hole Bottom: _____ ft below grade

Depth, inches below grade	Soil Profile (color, texture, other)
3' - 0"	Alaeloa silty clay

PERCOLATION READINGS

Time 12 in of water to seep away: _____ min
Time 12 in of water to seep away: _____ min

Check one:

_____ Percolation tests in sandy soils, recorded time intervals and water drops at least every 10 minutes for at least 1 hour.

X Percolation tests in non-sandy soils, presoaked the test hole for at least 4 hours. Recorded time intervals and water drops at least every 10 minutes for 1 hour or if the time for the first 6 inches to seep away in greater than 30 minutes record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops don not vary by more than 1/16 inch.

Time Interval	Drop in Inches	Time Interval	Drop in Inches
30	7.0	30	2.4
30	5.2	30	1.6
30	3.8	30	1.2

Percolation Rate (time/final water level drop): 25.0 min/in

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable. I also attest that three feet of suitable soil exist between the bottom of the soil absorption system and the groundwater table or any other limiting layer.

Engineer's Signature/Stamp

Site Evaluation/Percolation Test Form, revised 1/94

YUKIMURA CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIKE
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

In reply, please refer to:
EMD / WB

Subject: Individual Wastewater System for Maui Land & Pineapple Company, Inc.

TMK: (2) 4-2-04:032(Por)

Mailing Address: 1000 Kapalua Drive
Kapalua, Maui, Hawaii 96761

I, Don Young/Executive Vice President/ Resort & Commercial Property, hereby certify that I am the owner(s) of the subject property and that I have read the following and shall comply with all provisions. Failure to comply with any or all of the provisions can lead to imposition of the penalties and remedies as provided for in Administrative Rule, Title 11, Chapter 62, Section 11-62-42, Penalties and remedies.

1. I certify that as the owner of the Individual Wastewater System (IWS) serving the subject property, the IWS will be inspected, operated and maintained in accordance with the operation and maintenance manual developed by my IWS design engineer (§ 11-62-31.1(e)(2).

   Furthermore, if an aerobic unit is utilized for wastewater treatment, an active service contract for the proper operation and maintenance shall be maintained at all times (§ 11-62-33.1(b)(3).

2. I understand and shall comply with the provision of § 11-62-08(g) which requires that the IWS be constructed by a licensed contractor.

   Furthermore, the licensed contractor information form shall be completed and submitted to the Department prior to final inspection.

3. I understand and shall comply with the provisions of § 11-62-31.1(f) which states that the IWS must be inspected and approved of by the Department prior to use.

Furthermore, I shall instruct and require my contractor to leave uncovered for inspection, various parts of the IWS system. These parts include manholes/access openings, distribution boxes, ends of trenches to visually see gravel, pipe and geotextile fabrics used and/or seepage pit openings. I understand that I will be required to re-expose these areas if at the time of inspection they are not visible.

4. I understand and shall comply with the provisions of § 11-62-31.1(e)(2) which requires me to certify upon sale or transfer of the subject property, that the appropriate transfer or sales documents and provisions shall bind the new owners to the operation and maintenance provisions referenced in item 1 above.

5. I understand and shall submit any and all changes made to my IWS plans to the Department (§ 11-62-08(b) for review and approval. Changes to the approved IWS plans that need to be submitted to the Department include but are not limited to the following - changes in location of any component of the wastewater system, changes in the type of products used, changes in the disposal system methods, changes in the dwellings/buildings location or size and changes in the design engineer for the IWS.

Signed: _____ Dated: 3/11/03

Appendix E

Drainage Report

Established 1969

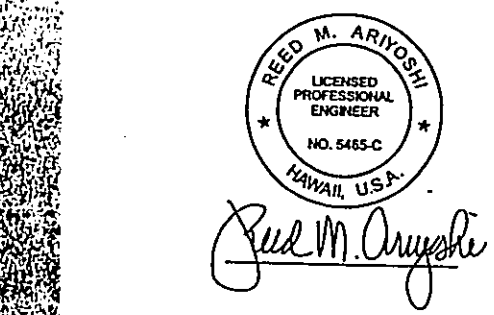
Drainage Report

Kalaepiha Point

Honolua, Lahaina, Maui, Hawaii

Prepared For:

Maui Land & Pineapple Co., Inc.
Kahului, Maui, Hawaii



Date: November, 2003

WARREN S. UNEMORI ENGINEERING, INC.
Civil and Structural Engineers - Land Surveyors
Wells Street Professional Center - Suite 403
2145 Wells Street
Wailuku, Maui, Hawaii 96793

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TABLE OF CONTENTS

Drainage Report
for
Kalaepiha Point

I. INTRODUCTION

This report has been prepared to examine both the existing drainage conditions and the proposed drainage plan for the subject development.

II. PROPOSED PROJECT

A. Site Location:

The proposed Kalaepiha Point project is situated in Honolua, Lahaina, Maui, Hawaii. It is located on the northwesterly side of Honolua Place and Honoapiilani Highway intersection. It is also directly adjacent to Honoapiilani Highway which borders its southeasterly boundary.

The project site is identified as Lot 2 of Kalaepiha Point Subdivision. The tax map key assigned to the parcel is (2) 4-2-04: portion of parcel 32. The project site contains an area of approximately 6.5 acres.

B. Project Description:

The proposed plan is to construct a single family residence with a swimming pool and gazebo on the subject parcel.

III. EXISTING CONDITIONS:

A. Topography and Soil Conditions:

The existing ground slopes from an elevation of approximately 110 feet± to 74 feet ± in a easterly to westerly direction, with an average slope of approximately 8.2%.

According to the "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii (August 1972)" the soil types at the project site consists of Rock land (rRK) and Alaeloa silty clay (AeC). Rock land is characterized as having flat to very steep slopes with a high shrink-swell potential. Alaeloa silty clay (AeC), 7 to 15 percent slopes, is characterized as having slow to medium runoff and slight to moderate erosion hazard.

B. Drainage:

The project site currently generates approximately 5.4 cfs of onsite surface runoff during a 50-year recurrence interval 1-hour duration storm. The surface runoff currently sheet flows across the project site in an easterly to westerly direction towards the ocean.

C. Flood and Tsunami Zone:

According to the Flood Insurance Rate Map, effective June 1, 1981, prepared by the U.S. Federal Emergency Management Agency, Federal Insurance Administration, the project site is located within Zone C, which is designated as areas prone to minimal flooding.

IV. DRAINAGE PLAN

A. General:

The design criteria that will be utilized to minimize the impact of increased surface runoff on the existing downstream properties is as follows:

1) There will be no significant change to the natural drainage pattern of the drainage area. It will continue to sheet flow towards downstream properties as it is presently doing.

According to our calculations, the post development onsite surface runoff generated from the project site is expected to be approximately 5.8 cfs for a 50-year recurrence interval 1-hour duration storm. Therefore, a net increase of approximately 0.4 cfs is expected as a result of the development of the project site (see Appendix A). This increase in onsite runoff will be directed into a new underground storm water retention drain system that will be installed as part of the subject project. The storm water retention system will consist of approximately 25 lineal feet of 72 inch

diameter perforated corrugated aluminum pipe. This system will be designed to accommodate the additional onsite post development flow generated from the project in accordance with the "Rules for the Design of Storm Drainage Facilities in the County of Maui." The pre-development surface runoff will be allowed to sheet flow off the project site as it is presently doing.

A table of pre-development and post development onsite surface runoff is shown:

Drainage Area	Pre Dev. Q (cfs)	Post Dev. Q (cfs)	Increase (cfs)
Project Site	5.4	5.8	(+) 0.4

B. Hydrologic Calculations:

The hydrologic calculations are based on the "Rules for the Design of Storm Drainage Facilities in the County of Maui", Title MC-15, Chapter 4 and the "Rainfall Frequency Atlas of the Hawaiian Islands", Technical Paper No. 43, U.S. Department of Commerce, Weather Bureau.

Rational Formula used:

$$Q = CIA$$

Where Q = Rate of Flow (cfs)

C = Runoff Coefficient

I = Rainfall Intensity (in./hr.)

A = Area (Acre)

The hydrologic calculations for this project may be found in Appendix A.

C. Conclusion:

According to our calculations, a net increase of approximately 0.4 cfs of onsite surface runoff is expected due to the proposed improvement of the subject project (see Appendix A).

This increase of onsite surface runoff will be accommodated by a new storm water retention drain system, which will result in no increase in onsite surface runoff into downstream properties. Therefore, it is our professional opinion that the proposed development will not have a adverse effect on the existing downstream properties.

Prepared by:
Brooks Y. Aoki, P.E.

Checked by:
Reed M. Ariyoshi, P.E.

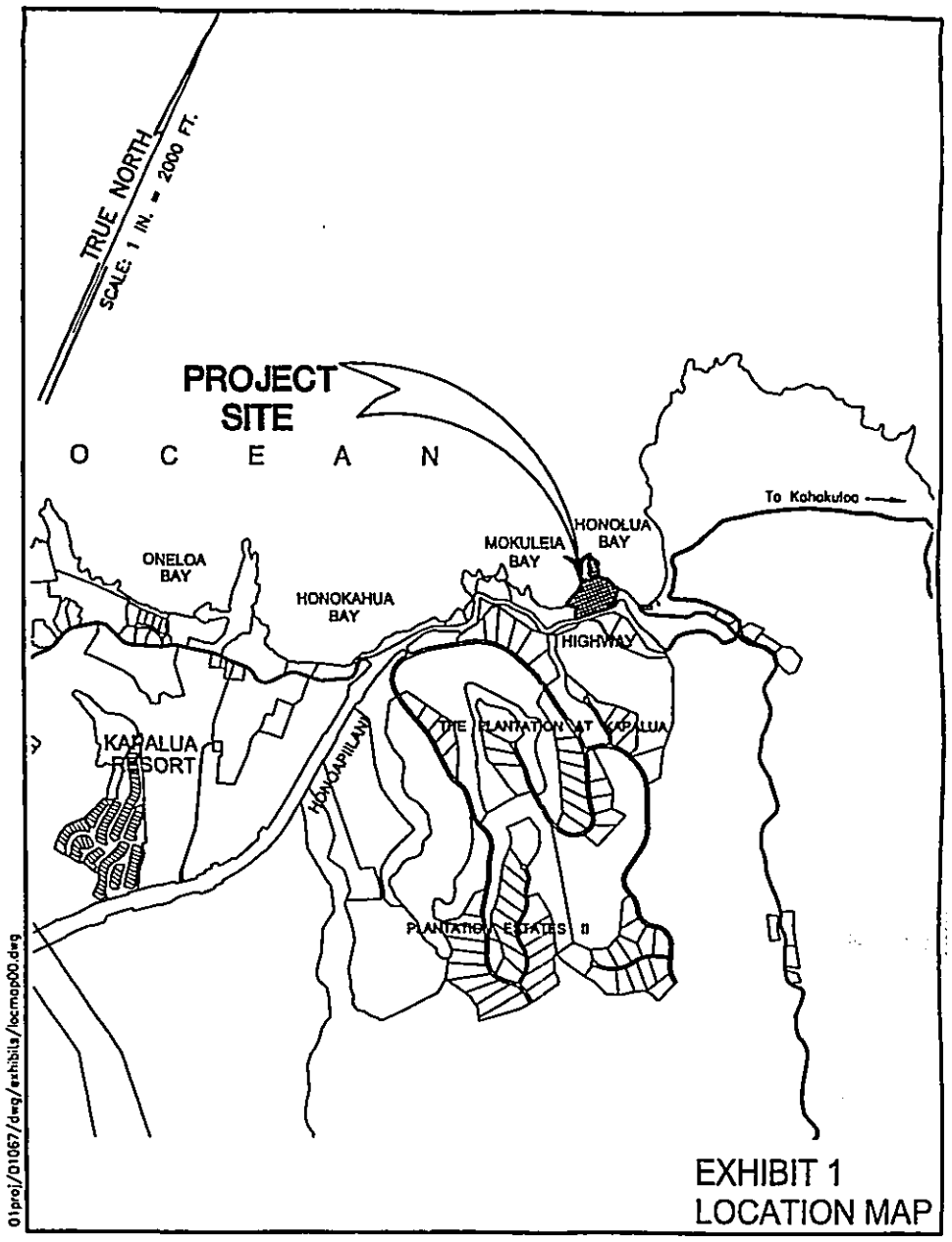
V:\PROJDATA\01proj\01067 - Kaluapilo Point Subdivision\Reports\Drainage\report08.wpd

V. REFERENCES

1. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* August 1972. United States Department of Agriculture, Soil Conservation Service.
2. *Flood Insurance Rate Map, Maui County, Hawaii.* Community-Panel Number 150003 0190D. March 16, 1995. Federal Emergency Management Agency, Federal Insurance Administration.
3. *Flood Insurance Rate Map, Maui County, Hawaii.* Community-Panel Number 150003 0170B. June 1, 1981. Federal Emergency Management Agency, Federal Insurance Administration.
4. *Rainfall Frequency Atlas of the Hawaiian Islands, Technical Paper No. 43.* 1962. U.S. Department of Commerce, Weather Bureau.
5. *Rules for the Design of Storm Drainage Facilities in the County of Maui.* July 1995. Department of Public Works and Waste Management, County of Maui.

EXHIBITS

1. Location Map
2. Flood Insurance Rate Map
3. Soil Survey Map



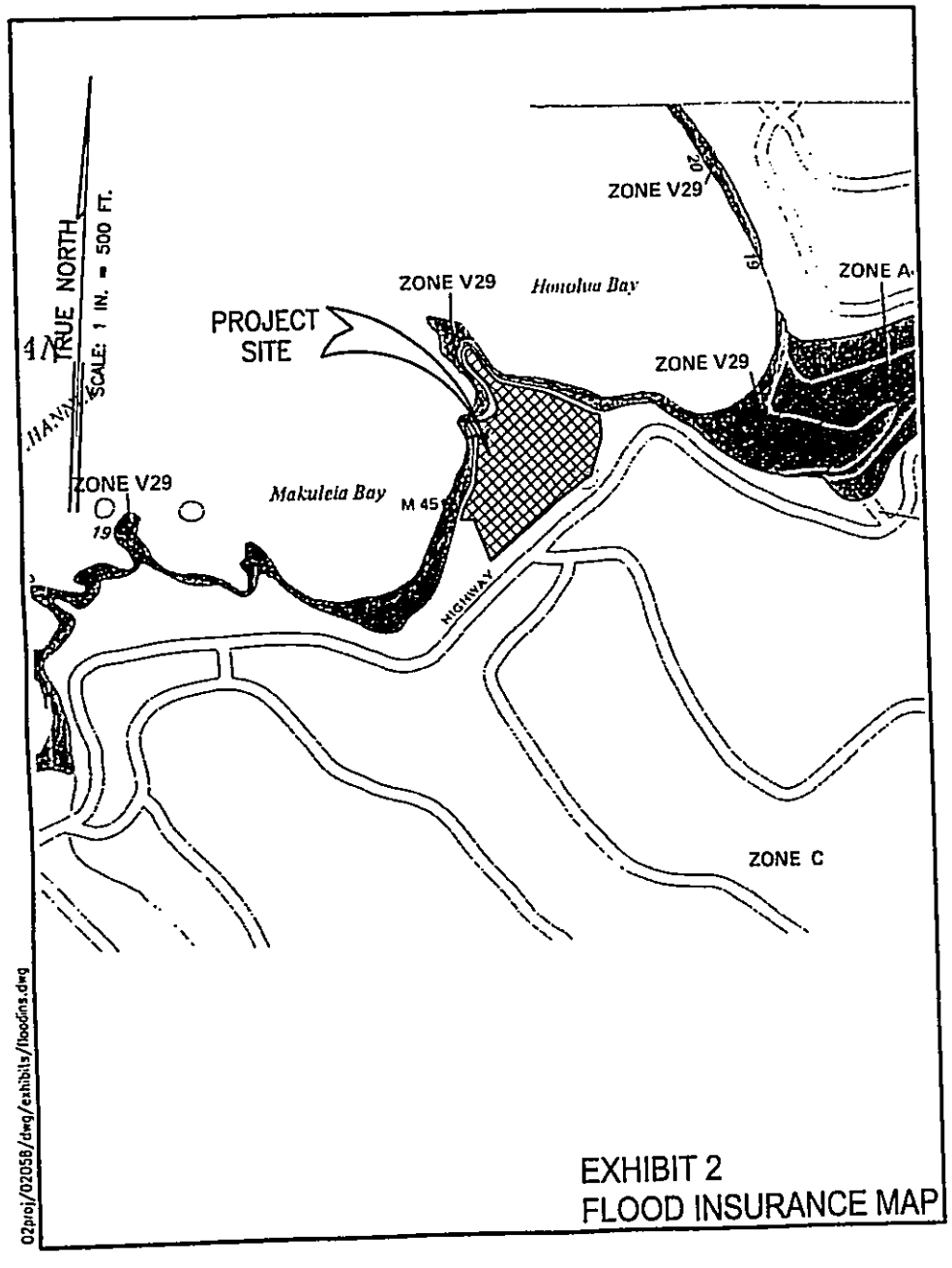


EXHIBIT 2
FLOOD INSURANCE MAP

EXHIBIT 3
SOIL SURVEY MAP

APPENDIX A

Hydrologic Calculations

Warren S. Unemori Engineering, Inc.
Wells Street Professional Center
2145 Wells Street , Suite 403
Wailuku, Maui, Hawaii 96793

Date: November 19, 2003

SUBSURFACE DRAINAGE SYSTEM ANALYSIS AND DESIGN

Project:	Kalaepiha Point
Location:	Honolua, Lahaina, Maui, Hawaii
Job Number:	WSUE 01067
Objective:	To determine the storage requirements for the anticipated increase in onsite surface runoff for the project site. A recurrence interval of fifty (50) years is used.

I. Determine 50-Yr. - 1 Hr. Rainfall:

From "Rainfall Frequency Atlas of the Hawaiian Islands", for Kihei, Maui, R(50 Yr.-1Hr.) = 2.75 inches

II. Determine Pre-Development Runoff:

Pre-Development Component Areas:

Total Area (Ac.):		4.05

Pre-Development Runoff Coefficents:

Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	Good (10-50%)	0.03
Development Type:	Agricultural	0.15
	Composite Runoff Coeff'L, C:	0.28

Pre-Development Time of Concentration:

Approx. Elev. Diff'L (feet):		36.00
Higher Elev. (ft.):	110.0	
Lower Elev. (ft.):	74.0	
Approx. Runoff Length (ft.):		440
Average Slope:		8.2%
Ground Character:		Ave. Grass
Time of Concentration (min.):		17.5

Pre-Development Intensity:

Intensity (in./hr.):		4.8

Pre-Development Runoff:

Q (pre-dev.) = C x I x A (cfs):		5.44
Allowable Release Rate (cfs):		5.44

III. Determine Post-Development Runoff:

Total Area (Ac.):		4.05

Post-Development Runoff Coefficent:

Paved / Roof Area (Ac.):		0.24
Runoff Coeff't., C:		0.95
Landscape Area (Ac.):		3.81
Infiltration:	Medium	0.07
Relief:	Rolling (5-15%)	0.03
Vegetal Cover:	High (50-90%)	0.00
Development Type:	Agricultural	0.15
Runoff Coeff't., C:		0.25
Weighted Runoff Coeff't., C:		0.29
C x A (post development):		1.18

IV. Establish Initial Trench Cross Section Parameters:

Cover Over Pipe (ft.):	1.00
Pipe Diameter (ft.):	6.00
Cradle Depth Below Pipe (ft.):	2.00
Cradle Thickness on Sides of Pipe (ft.):	2.00
Total Trench Depth (ft.):	9.0
Total Trench Width (ft.):	10.0
Gross Trench Cross Sectional Area (sf/lf):	90.0
Pipe Cross Sectional Area (sf/lf):	28.3
Trench Aggreg. Cross Sectional Area (sf/lf):	61.7

V. Determine Exfiltration:

Assume Exfiltration Limited to Sides of Trench Only:

Assumed Initial Length of Pipe / Trench (ft.):	25.00

VI. Determine Adequacy of Storage Volume Provided:

Determine Required Storage Volume:

Analytical procedures are based on methods prescribed in "Modern Sewer Design" (dated 1980, by the American Iron and Steel Institute).

Intensity values are obtained from the the Intensity-Duration Curves found page 122 of the "Drainage Master Plan for the County of Maui" (dated 1971, by R.M. Towill Corp.).

Time (min.)	I (in/hr)	Post-Dev. C x A (ac)	Accum. Runoff Vol. (cf)	Allow. Release (cf)	Storage Required. (cf)	Comments
(1)	(2)	(3)	(4)	(5)	(6)	
1	10.50	1.18	745	326	418	
2	8.40	1.18	1,192	653	539	
3	7.80	1.18	1,650	979	680	
4	7.40	1.18	2,099	1,306	794	
5	7.00	1.18	2,482	1,632	850	
6	6.70	1.18	2,851	1,958	893	Peak Storage
7	6.40	1.18	3,177	2,285	893	
8	5.90	1.18	3,348	2,611	737	
10	5.70	1.18	4,043	3,264	779	
15	5.10	1.18	5,426	4,896	530	
20	4.50	1.18	6,383	6,528	-145	
30	3.90	1.18	8,298	9,792	-1,494	

(COL 4) = (COL 1) x (COL 2) x (COL 3) x (60 sec./min.)
(COL 5) = Q(allowable) x (COL 1) x (60 sec./min.)
(COL 6) = (COL 4) - (COL 5)

Maximum Storage Required (cf):	893

Determine Provided Storage Volume:

Pipe Storage Capacity (cf):	706.9
Net Aggregate Cradle Storage Capacity (cf):	2,250.0
Gross Aggregate Cradle Volume (40% void ratio) (cf):	617.3
50% of void volume (cf):	308.6
Total Storage Capacity Provided (cf):	1,015.5

(Storage Provided = 1,015 cf) > (Storage Required = 893 cf); therefore initial assumptions based on 25 l.f. of 72-inch diameter pipe are acceptable.

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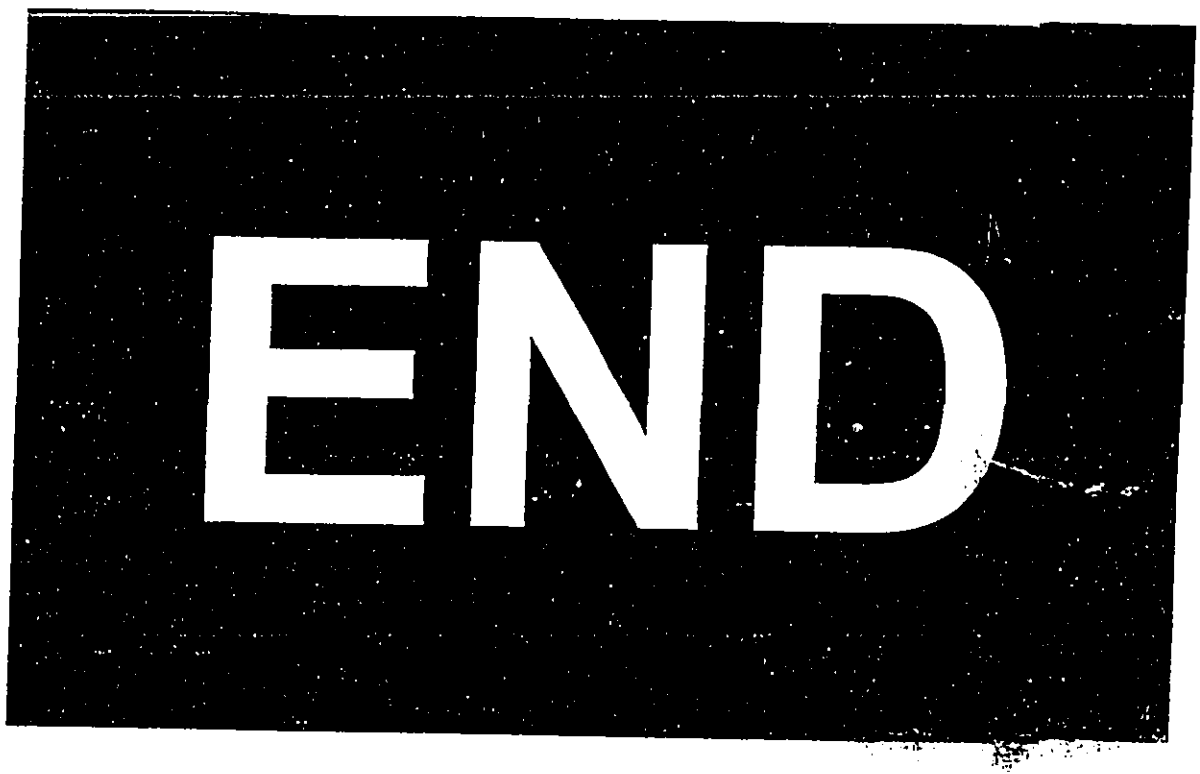

CERTIFICATION

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Joelle Kaai
SIGNATURE OF OPERATOR

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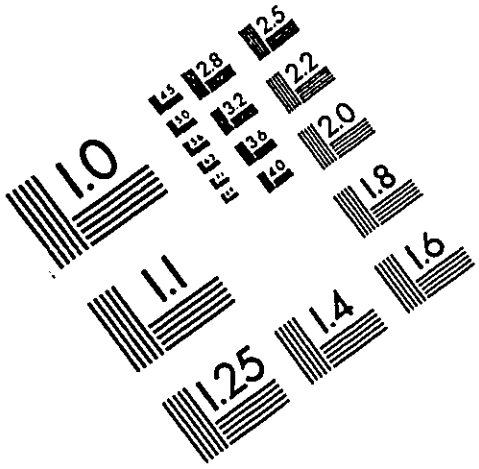

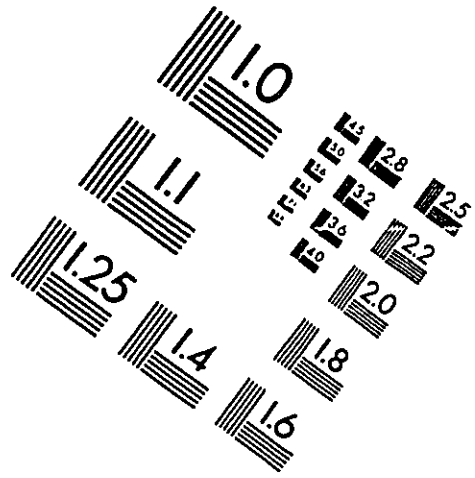

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612/854-0088 FAX 612/854-0482
8030 Old Cedar Ave. So., Ste. #215
Bloomington, MN 55425

PRECISION℠ RESOLUTION TARGETS

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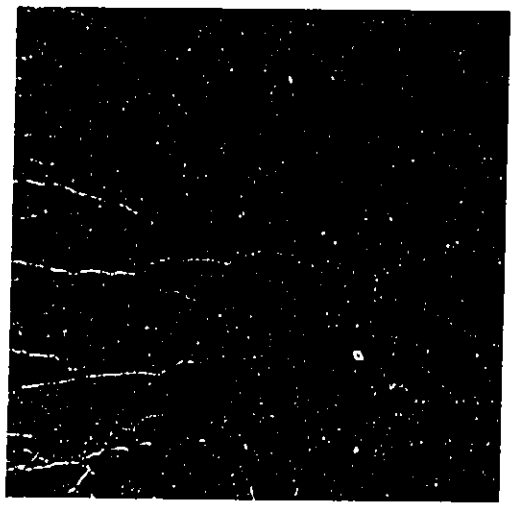

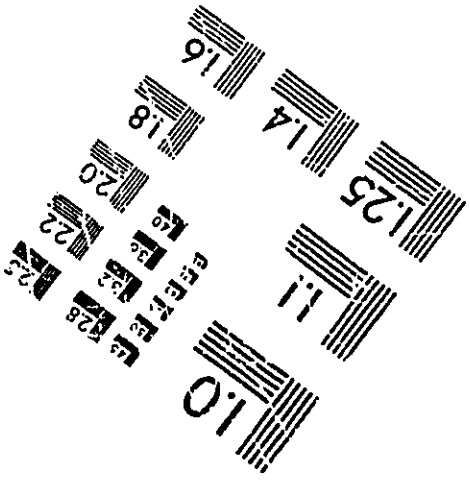

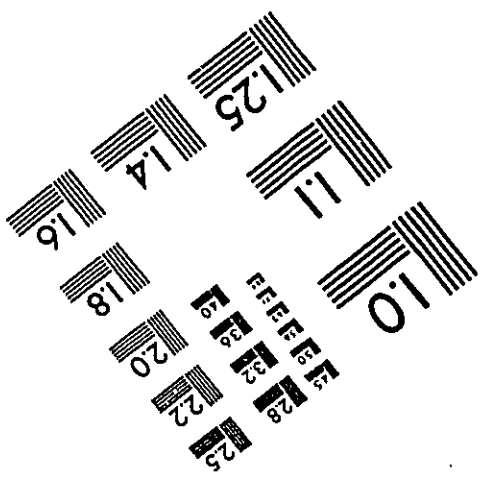

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DENSITY TARGET