

BELLES GRAHAM LLP

JONATHAN J. CHUN (2928)
3135 Akahi Street, Suite A
Lihue, Kauai, Hawaii 96766-1388
Telephone: (808) 245-2163
Facsimile: (808) 245-3277

Attorney for Petitioner
MOLOAA LOT 10A LLC,
a Hawaii limited liability company

BEFORE THE BOARD OF LAND AND NATURAL RESOURCES
OF THE STATE OF HAWAII

In The Matter Of The Application)	PETITION TO AMEND A PORTION OF
)	UNIT 4 OF THE ESTATES AT MOLOAA
Of)	BAY FROM THE LIMITED
)	CONSERVATION DISTRICT SUBZONE
MOLOAA LOT 10A LLC, a Hawaii limited)	TO THE GENERAL CONSERVATION
liability company, for a Petition to amend a)	DISTRICT SUBZONE; EXHIBITS "A"
portion of Unit 4 of The Estates At Moloaa)	THROUGH "H"
Bay from the limited conservation district)	
subzone to the general conservation district)	
subzone identified as Tax Map Key No. (4) 4-)	
9-009-002-0004.)	
_____)	

**PETITION TO AMEND A PORTION OF UNIT 4
OF THE ESTATES AT MOLOAA BAY
FROM THE LIMITED CONSERVATION DISTRICT SUBZONE
TO THE GENERAL CONSERVATION DISTRICT SUBZONE**

I. PETITIONER AND PROPERTY INFORMATION.

The Petitioner in this matter is MOLOAA LOT 10A LLC, a Hawaii limited liability company (hereinafter referred to as "Petitioner"). Attached hereto as Exhibit "A" is an authorization executed by Petitioner authorizing Jonathan J. Chun of Belles Graham LLP to file this Petition to Amend ("Petition").

This Petition is being filed pursuant to Hawaii Administrative Rules Section 13-5-5 and 13-5-16 (" Rules").

Petitioner is the owner of Unit 4 of The Estates At Moloaa Bay (hereinafter referred to as "Unit 4") identified as Tax Map Key No. (4) 4-9-009-002-0004. This Petition seeks to amend a portion of Unit 4 from the limited conservation district subzone to the general conservation district subzone. Unit 4 is entirely within the Limited Conservation District subzone. According to the Department of Land and Natural Resources' (hereinafter "DLNR") interpretation of HAR Section 13-5-24, single family dwellings in the limited subzone can only be constructed within the "flood zone or coastal high hazard area." While the Petitioner understands how this interpretation could be reached, this interpretation of HAR Section 13-5-24 encourages, rather than discourages, development in a flood zone or coastal high hazard area. The Petitioner believes this result is inconsistent with the policy of discouraging construction in flood zones or coastal high hazard areas. The Petitioner believes a more consistent interpretation of HAR Section 13-5-24 would be to allow single family dwellings within the limited subzone and, if it is in a flood zone or coastal high hazard, the structure would need to comply with all flood zone requirements as set forth in the rule. In the absence of the Board of Land and Natural Resources adopting this interpretation of its rule, the Petitioner is seeking to amend a portion of Unit 4 from the limited conservation district subzone to the general conservation district subzone.

A map showing the portion of Unit B to be amended from the limited conservation subzone to the general conservation subzone is attached hereto as Exhibit "B". A metes and bounds description of the area to be amended is attached hereto as Exhibit "C". The area Petitioner is proposing to amend that is the subject of this petition will be referred to herein as "Petition Area". The Petition Area is approximately 31,975 square feet as described in Exhibit "C".

II. DRAFT PROPOSAL.

The Petitioner proposes that the area shown on Exhibit "B" and described in Exhibit "C" be amended from being in the limited conservation district subzone to the general conservation district subzone.

The Petitioner proposes that Exhibit "1" Item No. 122 "K-9, Anahola" in HAR Chapter 13-5 be amended to show the proposed area in the Petition Area as being within the general conservation district subzone.

III. STANDARD OF REVIEW.

Pursuant to HAR Section 13-5-14(b) property within the general conservation subzone would include:

(b) The (G) subzone shall encompass:

(1) **Lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use;** and

(2) **Lands suitable for farming, flower gardening, operation of nurseries or orchards, grazing;** including facilities accessory to these uses when the facilities are compatible with the natural physical environment.

(emphasis added).

IV. STATEMENT OF INTEREST.

The Petitioner is the owner Unit 4 located at Moloa'a, Kauai, Hawaii, which includes the Petition Area.

The Petitioner's interest in filing this Petition is to construct a single-family dwelling within the Petition Area that would be in compliance with DLNR's single family residential standards adopted on August 12, 2011 attached as Exhibit 4 to HAR Chapter 13-5. As

the owner of Unit 4, Petitioner has an interest that is directly impacted by the subject matter of this Petition.

V. STATEMENT OF REASON.

HAR Section 13-5-16 provides:

(a) A landowner or government agency whose property is directly affected by this chapter may apply to the department to establish a new subzone, rezone an existing subzone, or change a boundary or identified land uses of a subzone. The board can initiate action under this section.

(b) The application shall include the following:

- (1) Name of applicant;
- (2) Name of landowner(s), if different from applicant, or any person or entity with the landowner's written consent;
- (3) Property description of land being affected by tax map key parcel (metes and bounds may be required when the department deems necessary);
- (4) Map of area drawn to scale;
- (5) Background of applicable land use commission petition, including a final decision and order (for new subzone designations);
- (6) Existing subzone classification or land use zoning designations of subject property and surrounding properties;
- (7) Geographic characteristics:
 - (A) General topography, geologic conditions, and slope; and
 - (B) Soils types and productivity rating (e.g., Agricultural Lands of Importance to the State of Hawaii (ALISH) and proposed Land Evaluation and Site Assessment (LESA));
- (8) Climatic characteristics (e.g., rainfall, predominant wind direction annually);
- (9) Hydrological characteristics (e.g., surface water, groundwater, drainage patterns) and applicable water area classification, if applicable, (e.g., restricted watershed, groundwater recharge area);
- (10) Biological (flora and fauna) characteristics (e.g., vegetation, wildlife, specific identified species, or habitat of identified threatened or endangered species);
- (11) A list of historic properties in the project area;
- (12) Scenic or visual resources (e.g., significant view planes and geological features);
- (13) Infrastructure evaluations (e.g., roads and access, water systems, sewage systems, drainage systems, recreational facilities, community population, income and household characteristics, and utilities availability);

- (14) Review of property characteristics in relation to subzone objectives;
- (15) Evaluation and recommendation of appropriate subzone designation and boundary characteristics; and
- (16) Application fee of \$500 and public hearing fee of \$250 plus publication costs.

The Petition submitted by the Petitioner contains the Petitioner's name, the tax map key of the property being affected, as well as a metes and bounds description of the particular area for which a redesignation is being requested. There are no applicable land use commission petitions that apply to this petition. The following sets forth the other information required by HAR Section 13-5-16.

A. Existing Subzone Classification or Land Use Zoning Designations. Unit 4 is within the Limited Conservation Subzone District. The other units of The Estates At Moloa'a Bay condominium project (Units 1- 3 and 5 - 8) are within the State Land Use Agricultural District. TMK (4) 4-9-009-003 (hereinafter "Parcel 3"), which is immediately to the east of Unit 4, is owned by the State of Hawaii and a majority of Parcel 3 is within the Limited Conservation Subzone District and the remaining portions are within the State Land Use Agricultural District.

B. Geographic Characteristics Of Unit 4.

1. General topography, geologic conditions, and slope. The Petition Area consists of land that slightly slopes north, towards the ocean. Scattered boulders, iron wood trees and vegetation are located within the Petition Area. Pictures of the Petition Area are attached hereto as Exhibit "D". A topographical survey for the Partition Area of the area was done by Esaki Surveying and Mapping and the average slope of the Partition Area is 31.3%. A copy of the map showing topographical contours of the area is attached hereto as Exhibit "B".

2. Soils types and productivity rating. The Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii prepared by the United States Department of Agriculture, Soil Conservation Service and issued in August 1972 (hereinafter "Soils Survey") shows the soils in this area as "Badlands" (BL) and "Lihue Silty Clay" (LhB). See Sheet No. 26 of the Soils Survey attached hereto as Exhibit "E." As defined in the Soils Survey, Badlands "occurs on the island of Kauai. It is steep to very steep and nearly barren. Runoff is very rapid, and geological erosion is active." Soils Survey at page 28.

Lihue silty clay (LhB) is found "on the tops of broad interfluves in the uplands ... In a representative profile the surface layer is dusky, red silt clay about 12 inches thick. The subsoil, more than 48 inches thick, is dark-red and dark reddish brown, compact silty clay that has subangular blocky structure. The substratum is soft, weathered rock. The surface layer is strongly acid. The subsoil is slightly acid to neutral. Permeability is moderately rapid. Runoff is slow, and the erosion hazard is about 1.5 inches per foot of soil." Soils Survey at page 82. According to the Soil Survey "[t]his soil is used for sugar cane, pineapple, pasture, truck crops, orchards, wildlife habitat, and woodland. (Capability classification IIe, irrigated or nonirrigated). Soils Survey at page 83.

The Detailed Land Classification – Island of Kauai published in 1967 by the Land Study Bureau of the University of Hawaii (hereinafter referred to as "Detailed Land Classification") shows the land in the Petition Area as being E87 or C42. See Map No. 96 of the Detailed Land Classification. A copy of Map No. 96 from the Detailed Land Classification is attached hereto as Exhibit "F". According to the Detailed Land Classification, land that is within the E87 classification has an overall productive rating of E, contains soils within the Rough Broken Land series, has a median average rainfall of 40-60 inches, is well drained and has slopes

between 36-80%. Existing uses of this land are for grazing and forest. See Table 2, Detailed Land Classification at page 17.

Land within the C42 classification, however, has an overall productive rating of C, contains soils within the Lihue and Kamilo series, is well drained and has slopes between 0-10%. Existing uses include sugar cane (irrigated), pineapple, and grazing. See Table 2, Detailed Land Classification at page 13. Petitioner believes the Petition Area is within the C42 classification based on Geotechnical Report the Petitioner had done for the area. The Geotechnical Report noted on page 2, Section 4.3, that the last 150' of the proposed roadway is within the LhB soils area with slopes of only 0 to 8 percent. A copy of the Geotechnical Report is attached hereto as Exhibit "G".

In 1986 the State of Hawaii Land Evaluation and Site Assessment ("LeSA") Commission published its report regarding the classification of agricultural lands in Hawaii. The Petition Area was included within the LESA boundaries as delineated by the 1986 LESA Commission report. One of the primary criteria utilized by the LESA Commission was the soil type as shown in the 1972 Soils Report. According to the LESA Commission LhB soils were given a preliminary rating of 79. The estimated LESA threshold scores for Kauai are 76 for intensive crops, 73 for diversified agriculture and orchards and 53 for grazing.

In 1977 the Hawaii Department of Agriculture adopted a classification system to identify prime agricultural lands within the State of Hawaii. See Agricultural Lands of Importance to the State of Hawaii ("ALISH"), Revised, November 1977. This classification system was based primarily, but not exclusively, on the characteristics of the soils. The ALISH map of prime agriculture lands for the area surrounding the Petition Area generally follows the outlines of the the LhB soils type. See ALISH Map for Kauai attached hereto as Exhibit "H". Compare the Soils Survey Map (Exhibit "E") with the ALISH map for Kauai (Exhibit "H"). Because of the scale of

the maps used by ALISH as well as the Soils Survey it is hard to determine the exact boundaries of the prime agricultural lands. Again, if we were to utilize the soils type that was actually found within the Petition Area it would be clear that land within the Petition Area is suitable for farming.

3. Climate characteristics. The Petition Area is located on the north windward side of the Kauai. According to the Detailed Land Classification study the area has an average rainfall of 40-60 inches. The average temperature for the north shore of Kauai is between 67°F and 85° F.

4. Hydrological characteristics. There are no streams within the Petition Area. According to the Soils Survey the permeability of the soil is moderately rapid and runoff is slow. The erosion hazard is about 1.5 inches per foot of soil. If the Petition Area is within the C42 or E87 classification area of the Detailed Land Classification the soil in that area is listed as well drained. Rainfall drains toward the ocean. There are no listed streams within or near the Petition Area. The nearest stream is Moloa'a Stream approximately half a mile to the north of the Petition Area. The Petition Area is below (makai) of the State Department of Health UIC line.

5. Biological (flora and fauna) characteristics. The predominate flora in the Petition Area is mature ironwood trees and small bushes. The needles from the ironwood trees limit the number and type of vegetation found in this area. Predominate fauna within the Petition Area are wild pigs and chickens.

6. A list of historic properties in the project area. According to the County of Kauai East Kauai Heritage Resources Map which shows the location of registered historic sites and other important heritage resources, there are no historic sites or heritage resources within the Petition Area. The closest historic resource is the traditional agricultural areas immediately to the south and east of the Petition Area that was used for sugar and pineapple cultivation.

7. Scenic or visual resources. The East Kauai Heritage Resources Map does not list or show any scenic or visual resources within the Petition Area. The views from the Petition Area looking north and east are of the Pacific Ocean.

8. Infrastructure evaluations. There are no public roads that currently serve the Petition Area. The Developer of The Estates At Moloaa Bay, who also owns Unit 4, plans on constructing a road from Moloaa Road, a government owned road, to Unit 4. There is also no government owned water system that serves Unit 4. The Developer also will be drilling and installing water wells with The Estates At Moloaa Bay that will serve all units with the condominium project. Wastewater from Unit 4 will be processed through a DOH approved individual wastewater system. Electric power can be provided by Kauai Island Utility Cooperative, but the Developer will be required to provide easements and conduit for the electrical lines. The proposed roadway will include conduits for electrical and other utilities. A drainage and grading plan for The Estates At Moloaa Bay are being prepared. The closest census tract to Moloaa is Anahola. The 2020 median income for Anahola was \$61,250 and the poverty rate for that area was 12.7%. The 2020 median age for Anahola is 40.9 years and the median property value for 2020 is \$440,100. In the 2021 American Community Survey the median income for Anahola is listed as \$87,563. According to the 2021 American Community Survey the average household size in Anahola is 3.72 and total households are 750.

9. Review of property characteristics in relation to subzone objectives.

As described in HAR Section 13-5-12(b) lands within the limited (L) conservation subzone are intended to encompass:

- (1) **Land susceptible to floods and soil erosion, lands undergoing major erosion damage and requiring**

- corrective attention**, as determined by the county, state, or federal government; and
- (2) Lands necessary for the protection of the health, safety, and welfare of the public **by reason of the land's susceptibility to inundation by tsunami, flooding, volcanic activity, or landslides, or which have a general slope of forty per cent or more.**

(emphasis added).

In comparison as described in HAR Section 13-5-14(b) lands within the general (G) conservation subzone are intended to encompass:

- (1) **Lands with topography, soils, climate, or other related environmental factors that may not be normally adaptable or presently needed for urban, rural, or agricultural use; and**
- (2) **Lands suitable for farming, flower gardening, operation of nurseries or orchards, grazing; including facilities accessory to these uses when the facilities are compatible with the natural physical environment.**

(emphasis added).

In reviewing these land characteristics, the proposed Petition Area does not match the description of land that is encompassed by the limited subzone, but instead is more closely aligned to the description of lands within the general subzone. For example, the area surrounding the proposed Petition Area is not susceptible to floods since it sits at an elevation between 187' and 205' above sea level. Also, due to its elevation, it is not susceptible to tsunami action. There are no nearby rivers or streams that could flood the area, nor does the proposed site sit in the middle of a gully or drainage area where runoff could collect.

As stated in the Geotechnical Report the soil within the Petition Area is Lihue Silty Clay (LhB). According to the Soil Survey "[r]unoff is slow, and the erosion hazard is no more than slight" for LhB soil. Soil Survey at page 82. The Capability Classification for LhB soil is

He which, according to the Soil Survey means the "soils are subject to moderate erosion if they are cultivated and not protected." Soil Survey at page 153. There are no active volcanos in the Petition Area or on the entire island of Kauai so this criteria for a limited subzone is not met. Finally, as shown on the topographical map attached hereto as Exhibit "B" the average slope for the Partition Area is 31.3%, which is well below the 40% or more criteria for lands within the limited subzone.

Lands within the LhB soil classifications "is used for sugar cane, pineapple, pasture, truck crops, orchards, wildlife habitat, and woodland." Soils Survey at page 83. This is also supported by the Detailed Land Classification. Since the soil type within the Petition Area is LhB it is more than likely the Petition Area is within the C42 classification under the Detailed Land Classification. Lands within the C42 classification have an overall productive rating of C. According to the Detailed Land Classification the existing uses, at that time, included sugar cane (irrigated), pineapple, and grazing. See Table 2, Detailed Land Classification at page 13. Since both the Soil Survey and the Detailed Land Classification recognize that the Petition Area has been utilized for farming it is well within the parameters described in HAR 13-5-14(b) as land suitable for farming.

The Petitioner believes a redesignation of the Petition Area from the limited to the general subzone is consistent with the current subzone designations in the area. For example, the area on the northwest side of Moloaa Bay adjacent to the limited subzone is classified as being within the general subzone. In fact, the general subzones are typically located immediately adjacent to limited subzones within Kauai's coastal areas such as Hanalei Bay, Papaa Bay, Hanamaulu Bay, the south side of Nawiliwili Harbor and Nohili Point.

Additionally, the classification of the subzone in this area seems to follow the soils classification set forth in the Soil Survey. The Soil Survey showed the soil in this area to be

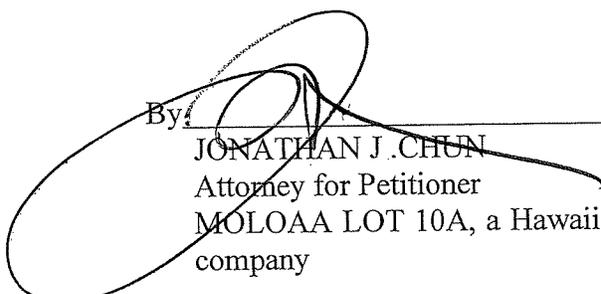
"Badlands" (BL) and "Lihue Silty Clay" (LhB) As defined in the Soils Survey, Badlands "occurs on the island of Kauai. It is steep to very steep and nearly barren. Runoff is very rapid, and geological erosion is active." Areas, however, that were outside of the "Badlands" designation and classified as being within a well-drained soils type (such as LhB on the west side of Moloaa Bay) were placed within the general conservation subzone. The location of the proposed Petition Area within the LhB soil classification and not the BL classification is consistent with the Detailed Land Classification for the area that was done in 1967 by the Land Study Bureau of the University of Hawaii.

VI. CONCLUSION.

Pursuant to HAR Rule 13-5-5 and 13-5-16, the Petitioner respectfully requests that the Board of Land and Natural Resource grant its Petition to amend the Conservation District Use map for the Petition Area from being in the Limited (L) Conservation Subzone to the General (G) Conservation Subzone.

DATED: Lihue, Kauai, Hawaii, October 10, 2023.

BELLES GRAHAM LLP

By: 

JONATHAN J. CHUN

Attorney for Petitioner

MOLOAA LOT 10A, a Hawaii limited liability company

LIST OF EXHIBITS

Exhibit "A"	Authorization
Exhibit "B"	Map of the Proposed Petition Area (with contours)
Exhibit "C"	Metes and Bounds Description of the Petition Area
Exhibit "D"	Pictures of the Petition Area
Exhibit "E"	Sheet No. 26 of the Soils Survey
Exhibit "F"	Map No. 96 from the Detailed Land Classification
Exhibit "G"	Geotechnical Report
Exhibit "H"	ALISH Map for Kauai

EXHIBIT "A"

AUTHORIZATION

MOLOAA LOT 10A LLC, a Hawaii limited liability company, whose mailing address is 2443 Fillmore Street #368, San Francisco, California 94115 ("Petitioner"), hereby authorizes JONATHAN J. CHUN of Belles Graham LLP to file its **PETITION TO AMEND A PORTION OF UNIT 4 OF THE ESTATES AT MOLOAA BAY FROM THE LIMITED CONSERVATION DISTRICT SUBZONE TO THE GENERAL CONSERVATION DISTRICT SUBZONE** on behalf of the Petitioner, with the Board of Land and Natural Resources, State of Hawaii.

DATED: October 10, 2023.

PETITIONER:

MOLOAA LOT 10A LLC,
a Hawaii limited liability company

By _____

William Campbell
Its Manager

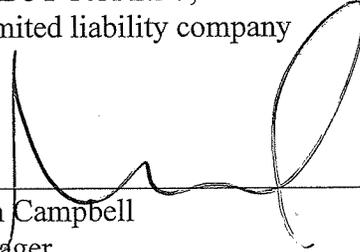


EXHIBIT "B"

M O L O O A A B A Y

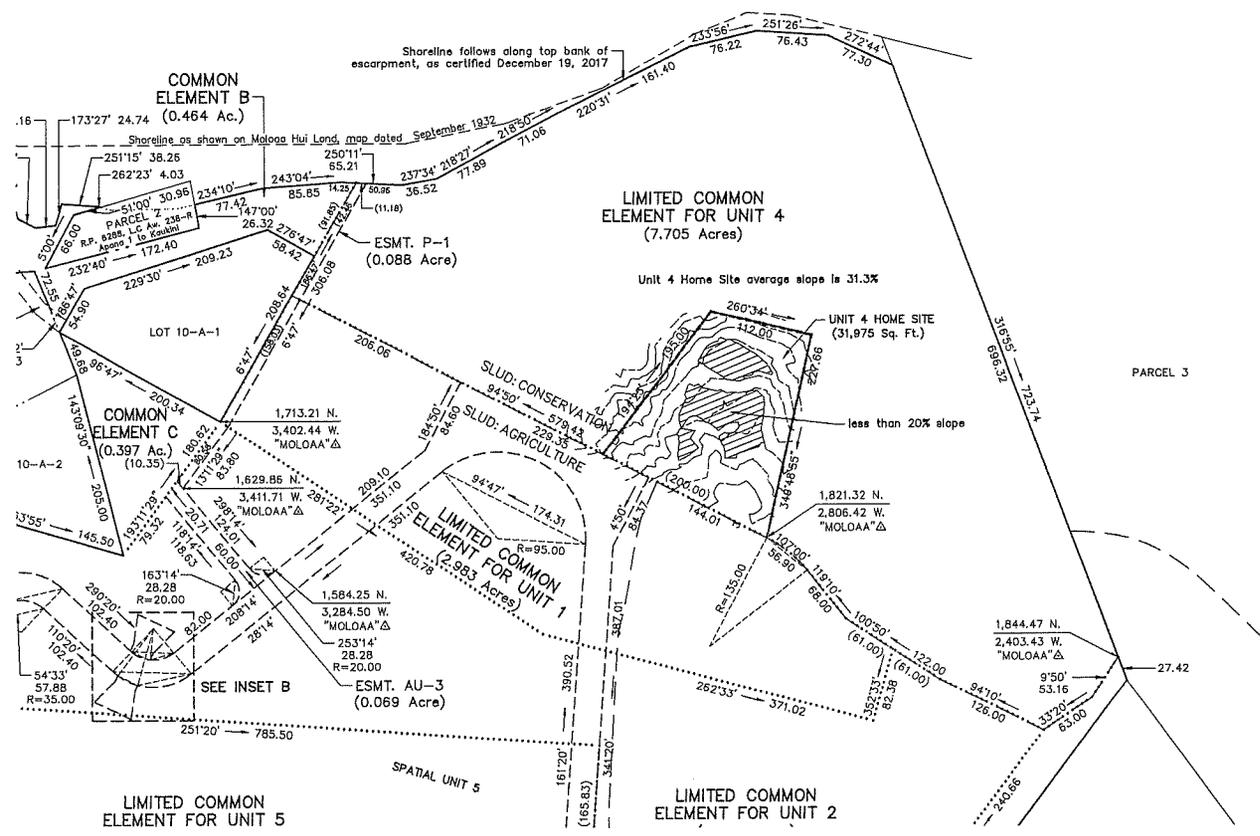
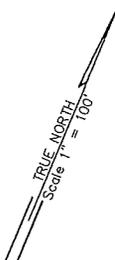


EXHIBIT "B"

THE ESTATES AT MOLOAA BAY
UNIT 4 HOME SITE

BEING PORTION OF LOT 10-A-4
MOLOAA HUI LANDS
MOLOAA, KAWAIHAU, KAUAI, HAWAII
TMK: (4) 4-9-09: 02
Owner: Molooa Lot 10A LLC.
Date: June 16, 2023

GRAPHIC SCALE

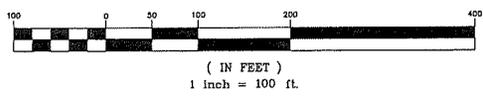


EXHIBIT "C"

UNIT 4 HOME SITE

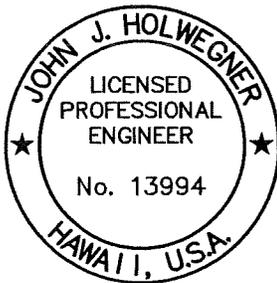
THE Estates at Moloaa Bay

LAND SITUATED AT MOLOAA, KAWAIHAU, KAUAI, HAWAII

Being Portion of Lot 10-A-4
Moloaa Hui Lands

Beginning at the southeast corner of this parcel of land, the coordinates of said point of beginning referred to Government Survey Triangulation Station "MOLOAA" being 1,821.32 feet North and 2,806.42 feet West, thence running by azimuths measured clockwise from true South:

- | | | | |
|----|--------------|--------|--|
| 1. | 94° 50' | 200.00 | feet along the remainder of Lot 10-A-4
(Limited Common Element for Unit 1); |
| 2. | 194° 25' | 195.00 | feet along the remainder of Lot 10-A-4
(Limited Common Element for Unit 4); |
| 3. | 260° 34' | 112.00 | feet along the remainder of Lot 10-A-4
(Limited Common Element for Unit 4); |
| 4. | 349° 48' 55" | 227.66 | feet along the remainder of Lot 10-A-4
(Limited Common Element for Unit 4) to
the point of beginning and containing an
area of 31,975 Sq. Ft. |



Lihue, Hawaii
June 2023

DESCRIPTION PREPARED BY:
ESAKI SURVEYING & MAPPING, INC.

A handwritten signature in black ink, appearing to read "John J. Holwegner".

John J. Holwegner
Licensed Professional Engineer
Certificate Number 13994

EXHIBIT "D"



EXHIBIT "D"





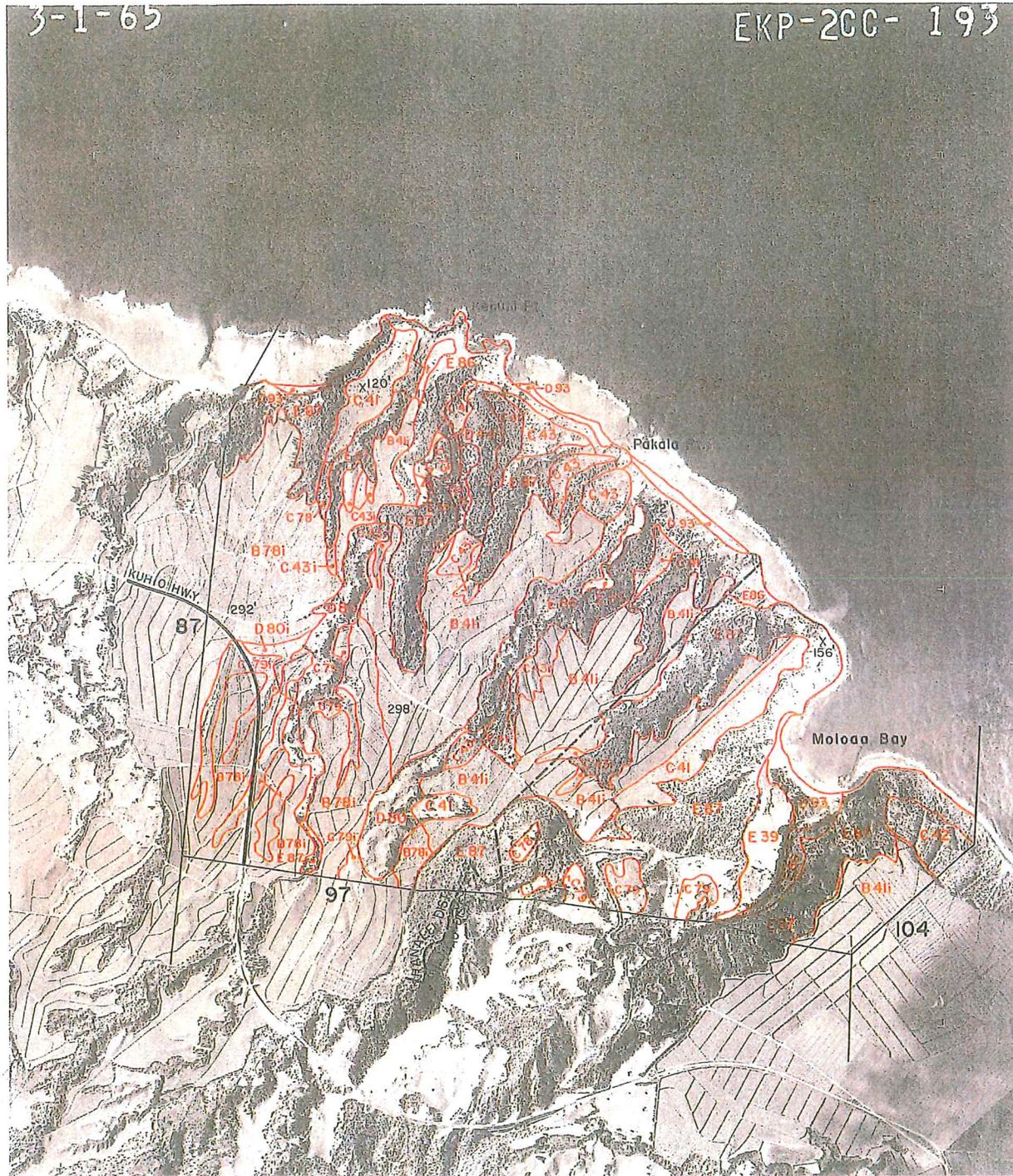


EXHIBIT "E"

EXHIBIT "F"

3-1-65

EKP-200- 193



Land classification data field mapped 1967.

LAND CLASSIFICATION SYMBOL:

- Master Productivity Rating
- ┌ Land Type. Number and letter "i" if irrigated; number only if unirrigated. (See sections of text where Land Types are defined and rated by selected uses.)



U.S.G.S. Quad References: Anahole

Approximate Scale (ft./in.) = $\frac{12,000 - \text{Ground Elevation}}{6}$

Aerial Photographs: U.S. Dept. of Agriculture, A.S.C.S.

LAND STUDY BUREAU · UNIVERSITY OF HAWAII

EXHIBIT "G"

**REPORT
GEOTECHNICAL INVESTIGATION**

**PROPOSED DRIVEWAY
CAMPBELL RESIDENCE
MOLOAA, KAUAI, HAWAII
TMK: (4) 4-9-009: 002**

for

**BILL CAMPBELL
MOLOA'A LOT 10A, LLC**

**BOW ENGINEERING & DEVELOPMENT, INC.
Engineers**

Project No. 17-0084
October 5, 2017

SHINSATO ENGINEERING, INC.
98-747 KUAHAO PLACE, #E
PEARL CITY, HI 96782

EXHIBIT "G"

SHINSATO ENGINEERING, INC.

CONSULTING GEOTECHNICAL ENGINEERS

98-747 KUAHAO PLACE, PEARL CITY, HAWAII 96782
PHONE: (808) 487-7855
FAX: (808) 487-7854

October 5, 2017
Project No. 17-0084

Mr. Bill Campbell
Moloa'a Lot 10A, LLC
c/o Bow Engineering & Development, Inc.
1953 South Beretania Street PH-A
Honolulu, Hawaii 96826

Dear Mr. Campbell:

This report presents the results of our geotechnical investigation for the proposed driveway to be constructed in Moloaa, Kauai, Hawaii.

A summary of the findings and recommendations are as follows:

- 1) Four (4) test pits and 5 dynamic cone penetrometer (DCP) test were conducted along the proposed roadway alignment to determine the subsurface soil conditions. In general, the test pits and DCP tests disclosed the site to be underlain by medium stiff to very stiff SILT. No groundwater was encountered in the test pits at the time of the field investigation
- 2) The recommended maximum cut slope inclination into the existing soils is 1-1/2 horizontal to 1 vertical. The maximum recommended fill slope inclination is 2 horizontal to 1 vertical. Where cut and fill slopes are greater than 15-feet in vertical height, terraces or benches shall be provided at vertical height intervals of 15-feet except that where only one bench is required, it shall be at the midpoint. The terrace or bench shall be a minimum of 8-feet wide and shall be provided with drainage provisions to control erosion on the slope face and bench surface.
- 3) The recommended pavement sections are as follows:
 - a) Paved roads: 2-inch AC
4-inch compacted aggregate base
 - b) Unpaved roads: 6-inch compacted select borrow

Site grading shall be designed to minimize ponding of water on the roadway surface, and to minimize erosion or scour along the shoulder of the roadway.

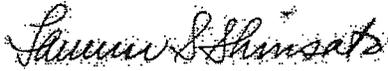
Details of the findings and recommendations are presented in the attached report.

This investigation was made in accordance with generally accepted engineering procedures and included such field and laboratory tests considered necessary for the project. In the opinion of the undersigned, the accompanying report has been substantiated by mathematical data in conformity with generally accepted engineering principles and presents fairly the design information requested by your organization. No other warranty is either expressed or given.

Mr. Bill Campbell
Moloa'a Lot 10A, LLC
October 5, 2017
Page Two

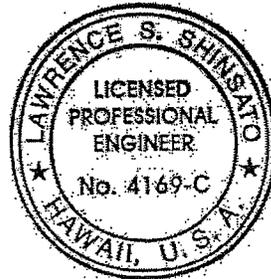
Respectfully submitted,

SHINSATO ENGINEERING, INC.



Lawrence S. Shinsato, P.E.
President

LSS:ks



This work was prepared by me
or under my supervision.
License Expires 04/30/18

GEOTECHNICAL INVESTIGATION REPORT
Proposed Driveway
Campbell Residence
Moloa'a Road
Moloaa, Kauai, Hawaii
TMK: (4) 4-9-009:002

1.0 INTRODUCTION

This investigation was made for the purpose of obtaining information on the subsurface conditions from which to base recommendations for the site preparation, grading and pavement design for the proposed driveway for the Campbell residence in Moloaa, Kauai, Hawaii. The location of the site, relative to the existing streets and landmarks, is shown on the Vicinity Map, Plate 1.

2.0 SCOPE OF WORK

The services included excavating 4 test pits to the depths of 1.25 to 3.0 feet below existing grade, performing 5 Dynamic Cone Penetration (DCP) Tests, obtaining samples of the underlying soils, performing laboratory tests to determine pertinent engineering properties of the representative soil samples, and performing an engineering analysis to determine foundation design parameters. The following information is provided for use by the Architect and/or Engineer:

- 1) General subsurface conditions, as disclosed by the test pits.
- 2) Physical characteristics of the soils encountered including the results of the DCP tests.
- 3) Recommendations for site preparation, grading and pavement design.
- 4) Special design considerations.

3.0 PLANNED DEVELOPMENT

From the information provided, the project will consist of constructing a driveway approximately 2,700 feet long and 20 feet wide from Moloaa Road to the proposed building site.

4.0 SITE CONDITIONS

4.1 Surface

The property is located on the northeastern side of Kauai near the northern end of Moloaa Road. The proposed driveway is will start on the east side of Moloaa Road near the intersection of Kuono Road and continue into the property. The ground surface is uneven and overgrown with a moderate to very heavy vegetative cover.

4.2 Subsurface Conditions Encountered in the Field Investigation

Four (4) test pits and 5 dynamic cone penetrometer (DCP) test were conducted along the proposed roadway alignment to determine the subsurface soil conditions. The location of the test pits and DCP tests are shown on the Plot Plan, Plate 2. Detailed logs of the test pits are presented in the appendix of this report. The results of the DCP tests are shown on the attached plates.

- a) The test pits were performed using hand tools. In general, the test pits disclosed the site to be underlain by moderate to very stiff, plastic and non-plastic, SILT. No groundwater was encountered in the test pits at the time of the field investigation

- b) The Dynamic Cone Penetrometer (DCP) tests were performed in general accordance with the ASTM D6951 test procedure to determine the approximate California Bearing Ratio (CBR) of the underlying subgrade soils.

The DCP test, which was developed by Kessler Soils Engineering Products, Inc., consists of a steel rod with a steel cone attached to the end. The cone is driven into the subgrade by means of a sliding hammer.

Depending on the consistency and type of subgrade soil, the hammer weight can be either 8 kg. (17.6 lbs.) or 4.6 kg (10.1 lbs.). The free fall of the hammer is 575 mm. (22.6 inches).

The depth of cone penetration is measured at selected hammer drop intervals. From these measurements, a Kessler DCP index is determined which is then correlated to an approximate field CBR value.

4.3 Geology and Soil Description

The island of Kauai consists of single shield volcano which is deeply eroded and partially veneered with much later volcanics. The formation of the island above sea level is believed to have begun in late Tertiary time (between 1 and 12 million years ago). Lavas erupted through radial fissures and along an ENE-WSW rift zone. As the volcano developed, the summit began to collapse to form the Olokele caldera. During a period of quiescence, soils formed and streams cut canyons into the shield. In the late Pliocene (about 1.4 million years ago), eruptions from the Koloa Volcanic Series began to pour down canyon walls, displace streams and veneer sea cliffs (Stearns, 1966).

Lava flows from the Koloa Volcanic Series Cover about half of the surface of the eastern part of the island and are underlain by the Waimea Volcanics. The lavas are generally of pahoehoe and aa type. The upper soil mantle developed from weathering of the parent rock.

From the USDA Soil Conservation Service "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii", the majority of the proposed roadway site is located in an area designated as Badland (BL). Badland is described as "steep or very steep, nearly barren land, ordinarily not stony. The soil-forming material is generally soft or hard saprolite". Saprolite consists of completely weathered rock that retains the relict appearance of the parent bedrock.

The BL portion of the series is further described as "land type that occurs on the island of Kauai. It is steep to very steep and nearly barren. Runoff is very rapid, and the geological erosion is active".

The approximate last 150 feet of the proposed roadway alignment is located in an area designated as Lihue silty clay, 0 to 8 percent slopes (LhB). The Lihue series consists of well-drained soils on uplands on the island of Kauai. These soils developed in material weathered from basic igneous rock.

5.0 DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 General

Based on the findings and observations of this investigation, it is concluded that from a geotechnical perspective, the site may be developed for the intended use provided the recommendations contained in this report are included in the design and construction of the project.

5.2 Pavement Design

We anticipate that the roadway will be primarily used by cars and light truck with occasion heavier trucks (delivery and construction vehicles). The recommended pavement sections are as follows:

- a) Paved roads: 2-inch AC
4-inch compacted aggregate base
- b) Unpaved roads: 6-inch compacted subbase (select borrow)

Site grading shall be designed to minimize ponding of water on the roadway surface, and to minimize erosion or scour along the shoulder of the roadway.

The top 6 inches of pavement subgrade, subbase, and base course gravel shall be compacted to at least 95 percent of the maximum dry density (ASTM D1557). All material quality and compaction requirements for the pavement section shall be in accordance with the Hawaii State Standard Specifications for Road and Bridge Construction, dated 2005.

5.3 Slopes

The maximum recommended slope gradients are as follows:

- Cut slopes 1-1/2 horizontal to 1 vertical (1-1/2H:1V)
- Fill slopes 2 horizontal to 1 vertical (2H:1V)

Where cut and fill slopes are greater than 15-feet in vertical height, terraces or benches shall be provided at vertical height intervals of 15-feet except that where only one bench is required, it shall be at the midpoint. The terrace or bench shall be a minimum of eight feet wide and shall be provided with drainage provisions to control erosion on the slope face and bench surface.

Exposed slopes shall be covered as soon as practical after construction to minimize erosion.

Fill slopes shall be constructed by either overfilling and cutting back to compacted soil, or the slope shall be track-rolled.

5.4 Foundation Design Parameters

For the design of new structures such as retaining walls, the recommended foundation design parameters are as follows:

- a) Allowable soil bearing value: 2,000 psf for footings bearing on firm on-site soils or properly compacted fill.
- b) Footing Embedment Depth: The minimum footing embedment should be 12 inches below lowest adjacent grade (measured to bottom of footing) for footing constructed on relatively level ground (less than 5H:1V in gradient). Where footings are constructed on sloping ground, the footing embedment depth shall be increased to provide a minimum of 5-feet of horizontal setback from the edge of the footing to the slope face.

- c) Estimated foundation settlement: less than 1-inch

- d) Earth pressure coefficients: On-site soil: Kp = 2.50
 Ka = 0.40 (unrestrained)
 Ko = 0.60 (restrained, at-rest)
 soil unit weight: 100 pcf
 coefficient of friction: 0.4 x DL

 Imported structural fill:
 Kp = 3.50
 Ka = 0.27 (unrestrained)
 Ko = 0.42 (restrained, at-rest)
 soil unit weight: 140 pcf
 coefficient of friction: 0.7 x DL

- e) Site Class and coefficients: D: stiff soil profile

6.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations made at the test pit and DCP locations. If conditions are encountered during construction which appear to differ from those disclosed by the explorations, this office shall be notified so as to consider the need for modifications.

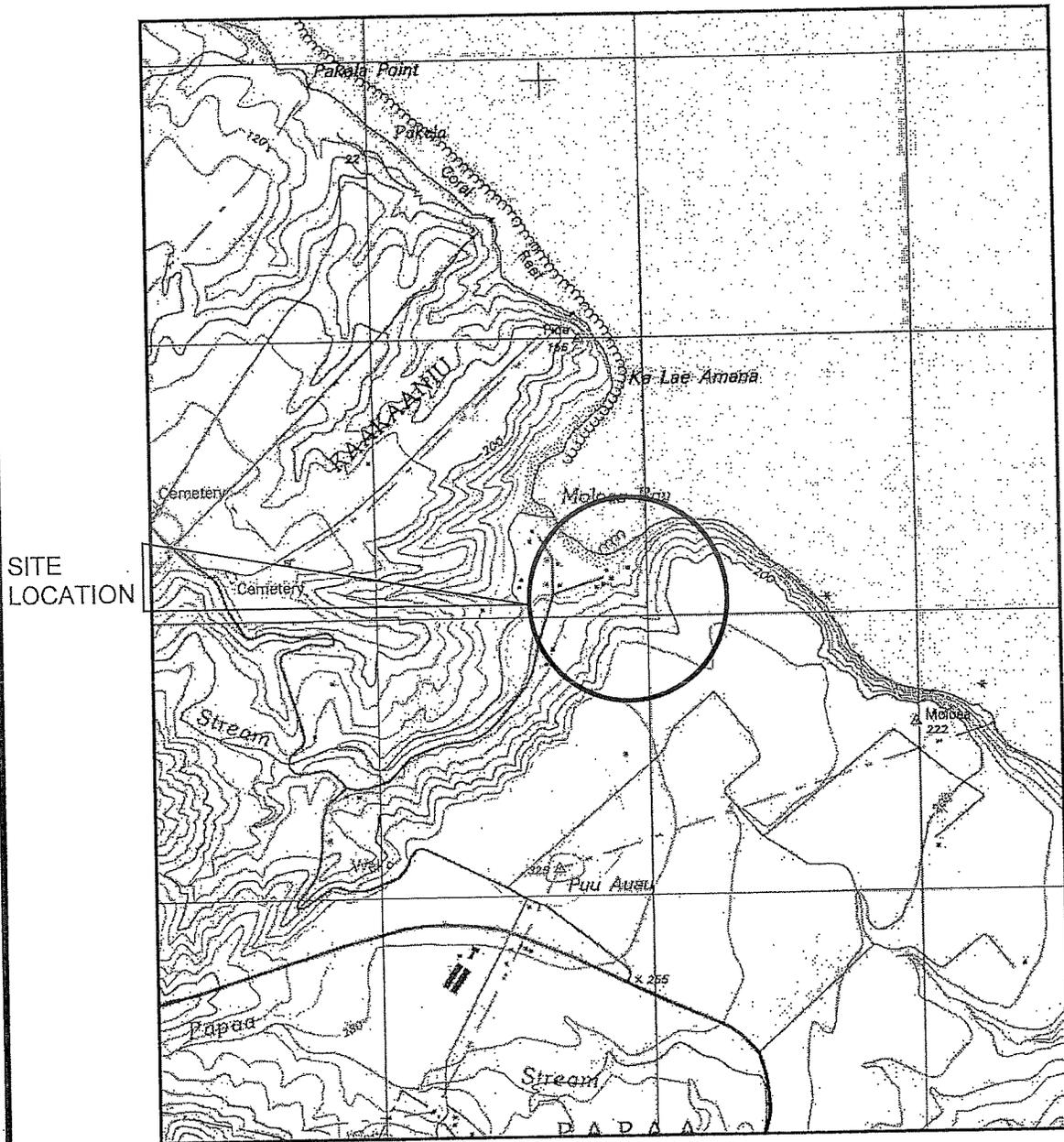
This report has been prepared for the exclusive use of Bill Campbell and Moloa'a Lot 10A, LLC, and their respective design consultants. It shall not be used by or transferred to any other party or to another project without the consent and/or thorough review by this facility. Should the project be delayed beyond the period of one (1) year from the date of this report, the report shall be reviewed relative to possible changed conditions.

Samples obtained in this investigation will deteriorate with time and will be unsuitable for further laboratory tests within one (1) month from the date of this report. Unless otherwise advised, the samples will be discarded at that time.

The following are included and complete this report:

Vicinity Map _____	Plate 1
Plot Plan _____	Plate 2
Log of Test Pits _____	Plate 3 thru 6
Results of Laboratory Tests _____	Plate 7 thru 8
DCP Test Results _____	Plate 9 thru 13

VICINITY MAP

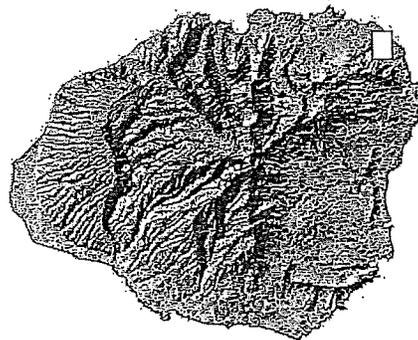


TRUE
NORTH



SITE
LOCATION

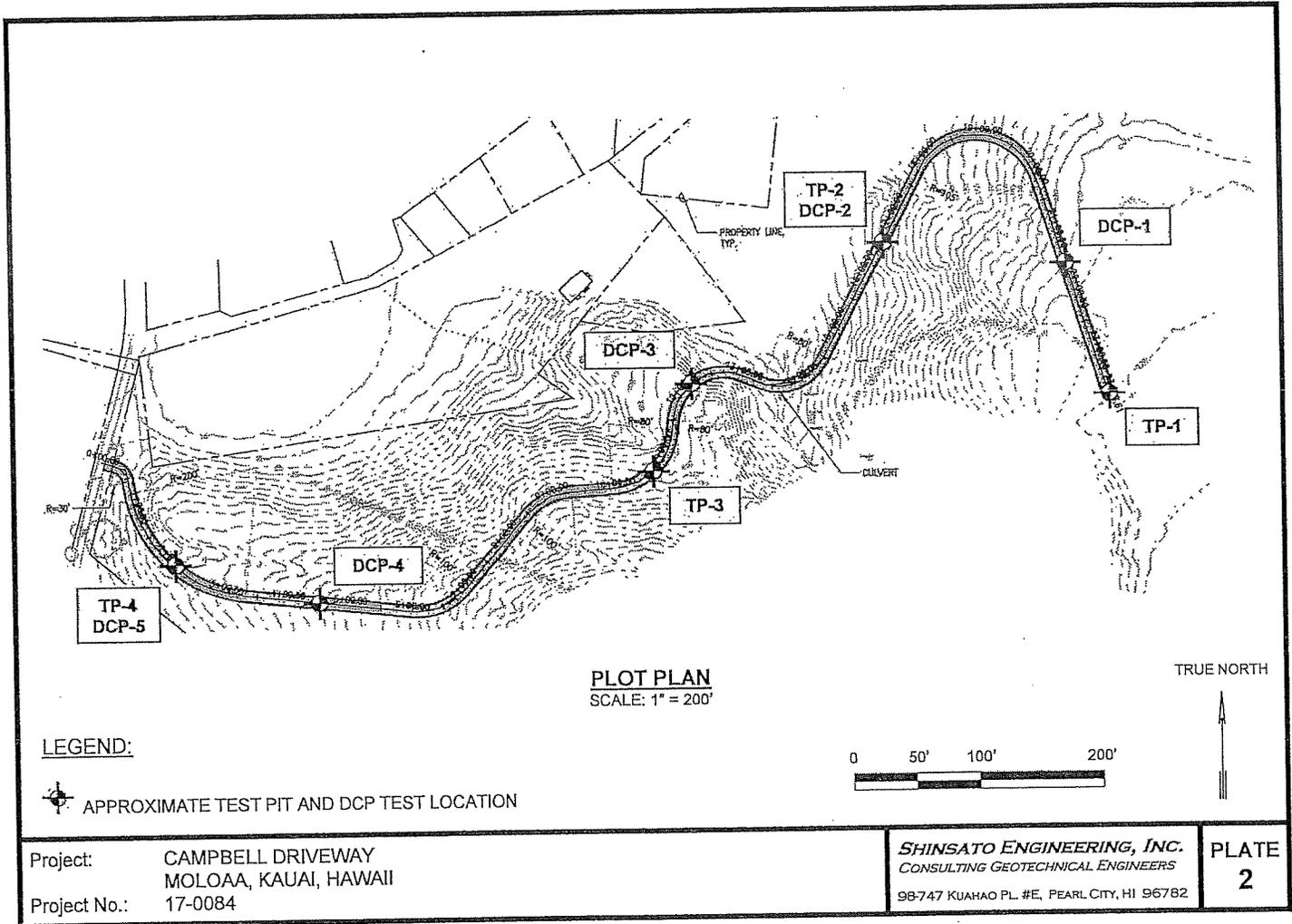
REFERENCE:
USGS TOPOGRAPHIC MAP
ANAHOLA QUADRANGLE
DATED 1996
SCALE: 1"=2000'



Project: CAMPBELL DRIVEWAY
MOLOAA, KAUAI, HAWAII
Project No.: 17-0084

SHINSATO ENGINEERING, INC.
CONSULTING GEOTECHNICAL ENGINEERS
98-747 KUAHAO PL. #E, PEARL CITY, HI 96782

PLATE
1



LOG OF TEST PIT NO. 1

EQUIPMENT USED: Hand Equipment
 DATE EXCAVATED: August 17, 2017

ELEVATION: Unknown
 DEPTH OF TEST PIT (FT.): 1.25
 DEPTH TO GROUNDWATER (FT.): Unknown

DEPTH (FT.)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT.)	PENETROMETER (TSF)	TORVANE STRENGTH (TSF)
0		MH	elastic SILT: trace roots		red brown	medium moist	medium stiff				
0.5			-no roots								
1				▼					26.2		
1.5			END OF TEST PIT				very stiff to hard				
2											
2.5											
3											
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											

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PLATE
3

LOG OF TEST PIT NO. 2

EQUIPMENT USED: Hand Equipment
 DATE EXCAVATED: August 17, 2017

ELEVATION: Unknown
 DEPTH OF TEST PIT (FT.): 2
 DEPTH TO GROUNDWATER (FT.): Unknown

DEPTH (FT.)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT.)	PENETROMETER (TSF)	TORVANE STRENGTH (TSF)
0		MH	elastic SILT; few roots		yellow brown	medium moist	medium stiff to stiff				
0.5			--no roots								
1					red brown				29.2		
1.5											
2			END OF TEST PIT				very stiff				
2.5											
3											
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											

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PLATE
4

LOG OF TEST PIT NO. 4

EQUIPMENT USED: Hand Equipment
 DATE EXCAVATED: August 17, 2017

ELEVATION: Unknown
 DEPTH OF TEST PIT (FT.): 1.5
 DEPTH TO GROUNDWATER (FT.): Unknown

DEPTH (FT.)	GRAPHIC SYMBOL	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	SAMPLE	COLOR	MOISTURE	CONSISTENCY	DRY DENSITY (PCF)	MOISTURE CONTENT (% OF DRY WT.)	PENETROMETER (TSF)	TORVANE STRENGTH (TSF)
0		MH	elastic SILT;		orange brown	medium moist	stiff				
0.5											
1									15.5		
1.5			END OF TEST PIT								
2											
2.5											
3											
3.5											
4											
4.5											
5											
5.5											
6											
6.5											
7											
7.5											

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PLATE
6

EXPANSION TEST RESULTS

LOCATION	DEPTH (ft)	TEST DRY DENSITY (pcf)	MOISTURE CONTENT (%)			SWELL (%)	TEST CONDITION	SWELL POTENTIAL
			BEFORE	AIR DRIED	SATURATED			
Boring 1, Sample 1	1.0	90.2	28.8	12.3	34.5	4.2	remolded, air dried to saturation	moderate
Boring 1, Sample 1	1.0	85.2	34.7	n/a	36.9	0.0	remolded, optimum to saturation	low
Boring 3, Sample 1	1.0	92.8	27.7	11.8	33.3	2.9	remolded, air dried to saturation	moderate
Boring 3, Sample 1	1.0	88.1	33.1	n/a	36.9	0.2	remolded, air dried to saturation	low

NOTES:

- 1) 1 psi surcharge.

PERCENT SWELL	SWELL POTENTIAL
<2	low
2-6	moderate
6-10	high
>10	very high

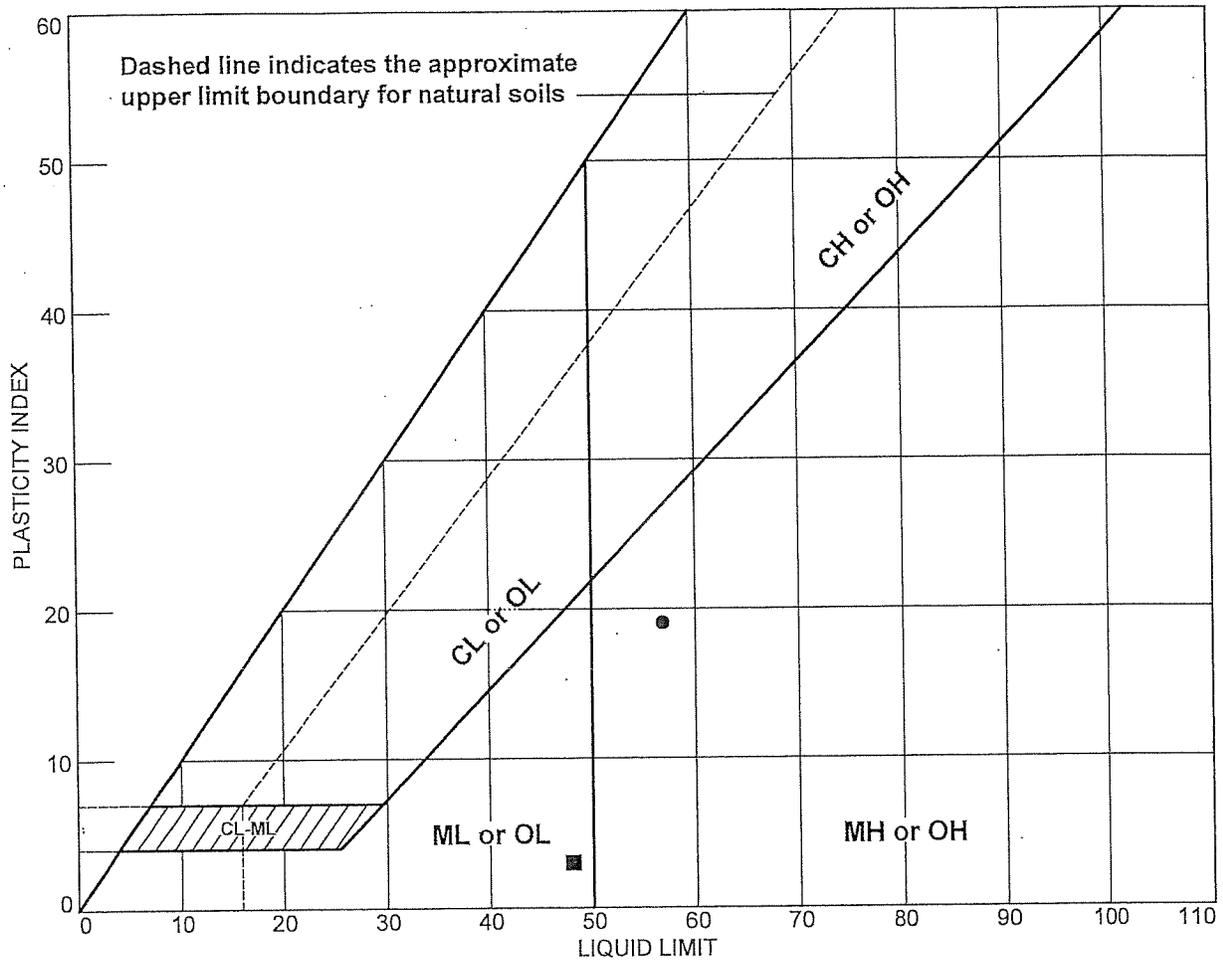
Project: CAMPBELL DRIVEWAY
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PLATE
7

ATTERBERG LIMITS



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	1	1	1.0	26.2	38	57	19	MH
■	3	1	1.0	24.4	45	48	3	ML

SHINSATO ENGINEERING, INC.

Pearl City, HI

Client:
Project: CAMPBELL DRIVEWAY
MOLOAA, KAUAI, HAWAII

Project No.: 17-0084

Figure 8

EXHIBIT "H"

Island of Kauai

ALISH

- Prime
- Unique
- Other
- Major Roads



This map was produced by the Office of Planning (OP) for planning purposes. It should not be used for boundary interpretation or other spatial analysis beyond the limitations of the data. Information regarding compilation dates and accuracy of the data presented can be obtained from OP.

Sources:
ALISH (Agricultural Lands of Importance to the State of Hawaii) - State Dept. of Agriculture, 1977.
Major Roads - USGS, 1983.



0 2.5 5 10 Miles

EXHIBIT "H"