DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
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KIRK CALDWELL
MAYOR

GEORGE I. ATTA, FAICP
DIRECTOR

ARTHUR D. CHALLACOMBE
DEPUTY DIRECTOR

2013/ED-9(MS)

October 11, 2013

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
State of Hawaii
Leiopapa A Kamehameha Building
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

SUBJECT: Chapter 343, Hawaii Revised Statutes
Draft Environmental Assessment (EA)

Applicant/ Landowner:	Jason D. Seymour
Agent:	Janine K. Seymour
Location:	61-357 Kamehameha Highway - Kawailoa
Tax Map Key:	6-1-12: 21
Request:	Shoreline Setback Variance
Proposal:	To allow (retain) a moss rock retaining wall, stairs and landing within the 40-foot shoreline setback area.

Attached, please find one hard and one electronic copy of the above-referenced Draft EA prepared by the Applicant for the project. Based on the significance criteria outlined in Title 11, Chapter 200, Hawaii Administrative Rules, the Applicant is not anticipating that preparation of an Environmental Impact Statement will be necessary. Also enclosed is a completed OEQC Publication Form, which we have also e-mailed to you. Please include the project in your October 23, 2012 publication of "The Environmental Notice."

If you have any questions, please call Malynne Simeon of our staff at 768-8023.

Very truly yours,

for George I. Atta, FAICP
Director

GIA:nw
Attachments
cc: Janine K. Seymour

APPLICANT ACTIONS
SECTION 343-5(C), HRS
PUBLICATION FORM (JANUARY 2013 REVISION)

Project Name: Seymour Moss Rock Retaining Wall
Island: Oahu
District: Waialua
TMK: 6-1-012:0021
Permits: Building Permit, Shoreline Setback Variance, Shoreline Certification

Applicant:
Jason Seymour
1187 Coast Village Rd. #196
Santa Barbara, CA 93108

Approving Agency:
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813
Malynne Simeon, (808) 768-8023

Consultant:
Janine K. Seymour MD
P.O. Box 14001 #196
Ketchum, ID 83340
805-452-3121
j9md@hotmail.com

Status (check one only):

_x_ DEA-AFNSI — Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov; a 30-day comment period ensues upon publication in the periodic bulletin.

__ FEA-FONSI — Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov; no comment period ensues upon publication in the periodic bulletin.

__ FEA-EISPN — Submit the approving agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov; a 30-day consultation period ensues upon publication in the periodic bulletin.

__ Act 172-12 EISPN — Submit the approving agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov. NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.

__ DEIS — The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.

__ FEIS — The applicant simultaneously transmits to both the OEQC and the approving agency, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqc@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.

__ Section 11-200-23 Determination — The approving agency simultaneous transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the applicant. No comment period ensues upon publication in the periodic bulletin.

__ Statutory hammer Acceptance — The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it failed to timely make a determination on the acceptance or nonacceptance of the applicant's FEIS under Section 343-5(c), HRS, and that the applicant's FEIS is deemed accepted as a matter of law.

__Section 11-200-27 Determination

The approving agency simultaneously transmits its notice to both the applicant and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.

__Withdrawal (explain)

Summary

The Applicant is requesting the approval of an after-the-fact Shoreline Setback Variance to authorize the existing moss rock retaining wall, stairway and landing in the 40-foot shoreline setback area. No new development or physical change is proposed to the Applicant's residential property.

The existing moss rock retaining wall and landing protect an existing legal nonconforming house and deck. The stairs allow safe access from the property to the beach. The structures are located landward of the assumed 2013 shoreline. The retaining wall is within 13.9 feet and 14.9 feet of the foundation of the legal nonconforming house and is located directly below the makai (ocean) edge of the legal nonconforming deck in line with the original post and pier foundations of the deck. The dimensions of the retaining wall are 60 inches tall, 19.6 feet long, 16 inches wide and the base is 10 feet above mean sea level. The landing provides additional stability to the retaining wall and is 177 inches long, 34 inches wide, twelve inches tall, and nine feet above mean sea level at its base. There are six stairs that lead down to the landing composed of moss rock with a concrete cap. The stairs are 15 feet above sea level at the top and ten feet 4.5 inches above meal sea level at the lowest stair.

The property is located at 61-357 Kamehameha Hwy, Haleiwa, HI 96712, TMK: 6-1-012: 021 on the makai (ocean) side of Kamehameha Highway.

Draft Environmental Assessment

For a

Shoreline Setback Variance Application for a

Moss Rock Retaining Wall, CRM Stairs

And Landing

Haleiwa, Oahu, Hawaii

6-1-012:021

City and County of Honolulu

Department of Planning and Permitting

650 S. King St.

Prepared By:

Dr. Janine K. Seymour
Environmental Research
P.O. Box 14001 - #196
Ketchum, ID 83340

August 2013

List of Figures and Tables

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List of Abbreviations

CRM	Concrete Rock Masonry
DLNR	Department of Land and Natural Resources
DPP	Department of Planning and Permitting
EA	Environmental Assessment
HRS	Hawaii Revised Statutes
LUO	Land Use Ordinance
MLCD	Marine Life Conservation District
msl	Mean Sea Level
ROH	Revised Ordinances of Honolulu
SMA	Special Management Area
TMK	Tax Map Key

1.0 Introduction

This Environmental Assessment has been prepared at the request of the Department of Planning and Permitting to be included with an application for a shoreline setback variance to conform to the requirements provided under Revised Ordinances of Honolulu (ROH) Chapter 23, Shoreline Setbacks, Hawaii Revised Statutes (HRS) §343-5 and §11-200 Hawaii Administrative Rules (HAR). Applicant is requesting "as is" approval for moss rock retaining wall, CRM stairs and landing within the shoreline setback.

1.1 General Information

Project Location: 61-357 Kamehameha Hwy, Haleiwa, HI 96712

TMK, Applicant and Recorded Fee Owner:

TMK:	6-1-012:021
Applicant/Owner:	Jason Seymour
Mailing Address:	1187 Coast Village Rd. #196, Santa Barbara, CA 93108
Local phone:	808-637-2732
Cell phone:	805-886-6688

Lot Area: 14590

Parcel Information:

Development Plan Areas:	North Shore
Historic Site Register:	none
Lot Restriction:	none
Neighborhood Boards:	27 North Shore
SMA:	In SMA
Shoreline:	Shoreline Setback
State Land Use:	Urban District
Street Setback:	None
Zoning (LUO):	R-5 Residential District
Subdivision:	Kawailoa Beach Lots Section D

Facility Code	Year Built	No. of Floors	Total Floor Area
01 - Detached Dwelling (detached from property line on all sides) (Last update in 2000)	1924	1	0
01 - Detached Dwelling (detached from property line on all sides) (Last update in 2000)	1970	1	0

Prepared by:

Janine K. Seymour, MD
Email: j9md@hotmail.com
Phone: 805-452-3121

Consultants:

Dave Robichaux — North Shore Consultants, Environmental Planning and Permitting
Email: robichaud001@hawaii.rr.com
Phone: 808-637-2732

Joeffrey Cudiamat, S.E., P.E., — Structural Hawaii Inc.; Structural Engineering
Email: engineer@StructuralHawaii.com
Phone: 808-488-5000

1.2 Approving Agency: Department of Planning and Permitting (DPP)

1.3 Scoping and Consultation

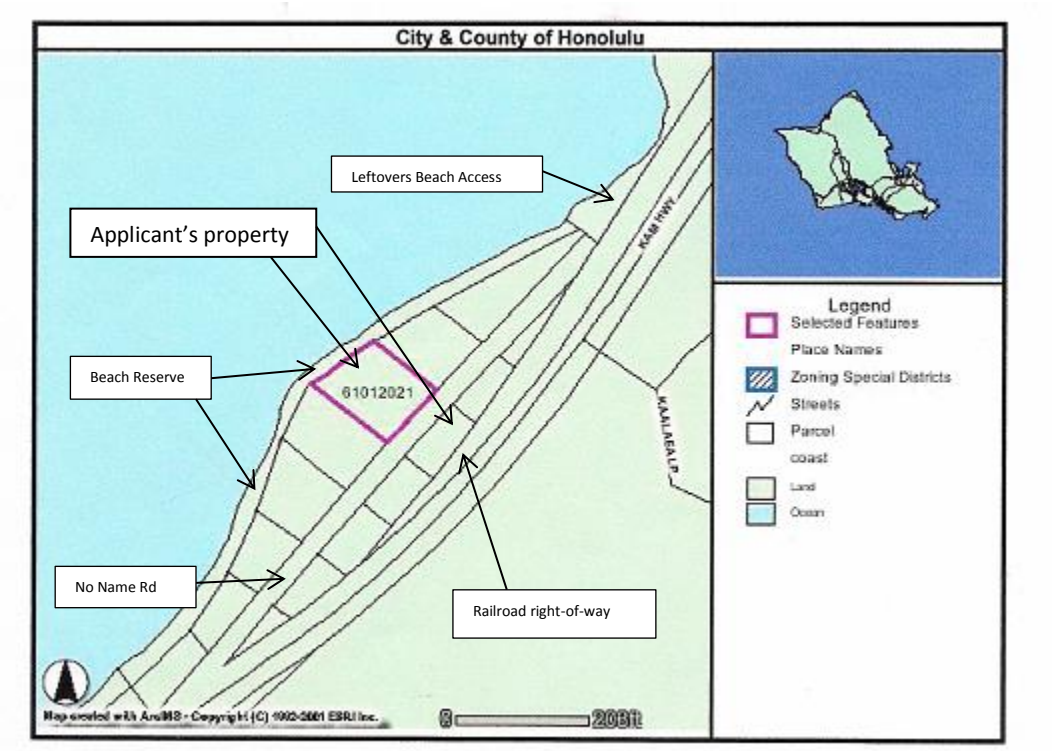
During the preparation of the Environmental Assessment, the applicant has had several meetings with DPP initially in 2006-2007 and more recently with Jamie Pierson, Jiro Sumada, John "Mike" Friedel, Steven Cheung and Lester Hirano on November 1, 2012. Sam Lemmo, Office of Conservation and Coastal Lands was consulted by phone on November 28, 2012. The applicant has also consulted with Joeffrey Cudiamat, a licensed structural engineer and with Dave Robichaux as a consultant in environmental planning and permitting. Other agencies will be consulted as part of the EA process and preparation.

2.0 Description and Background of the Proposed Action

The property is located on the makai (ocean) side of Kamehameha Highway and is part of Kawailoa Beach lots, Section "D" lot number 6 and 6A. It is located down a small private road off the highway called "No Name Road" in a development of single family homes. The property is located approximately 450 feet south of the public beach access of Leftovers. In addition to lot number 6 and 6A, the applicant's property includes a ⅛ undivided interest in 0.475 acre Beach Remnant Parcel (TMK:161-012-040) and a ⅕ undivided interest in the railroad right of way mauka of the property. (Figure 1)

The property was purchased by the applicant in June, 2004. At that time, the CRM stairs, landing and moss rock retaining wall were in place. It was not disclosed to the applicant that these structures were non-permitted. On June 23, 2006, applicant received a notice of violation of moss rock retaining wall, CRM stairway and landing. There are two small houses on the property.

Figure 1: TMK Map of Applicant's Property



Source: http://gis.hicentral.com/servlet/com.esri.esrimap

Figure 2: Scaled Architectural Site Plan showing all structures on the property along with the Shoreline Surveys as of 1996, 2000 and 2013

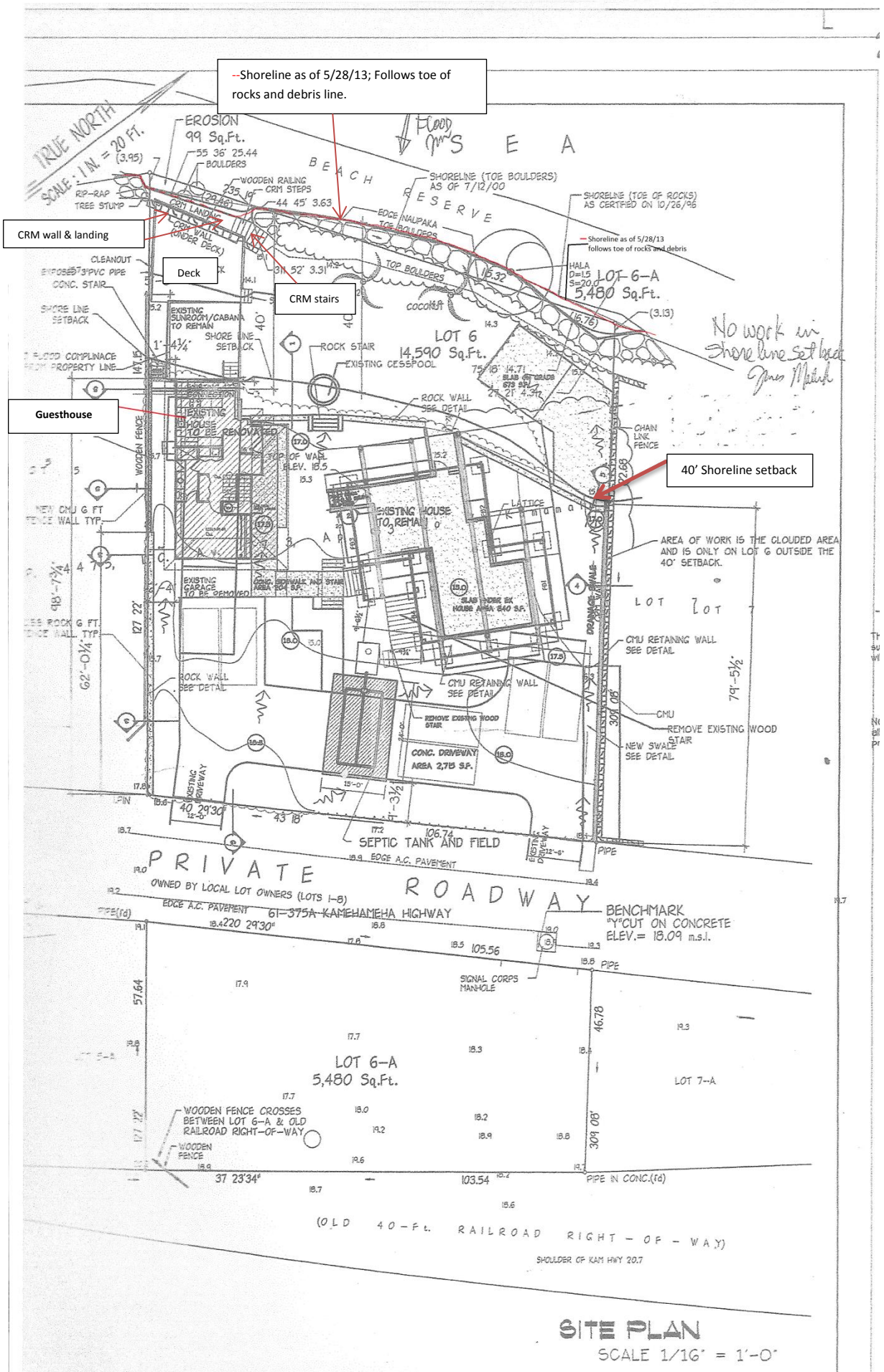
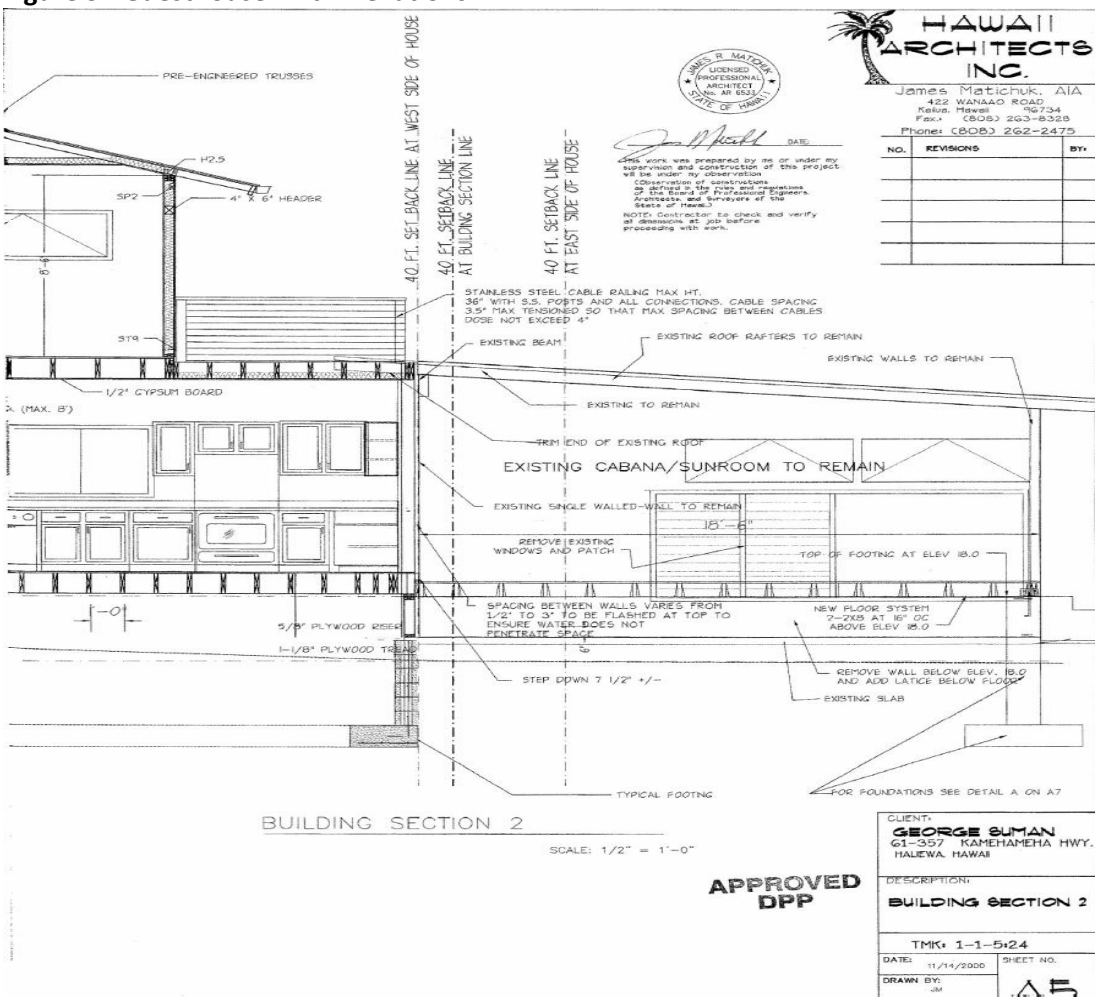

--Shoreline as of 5/28/13; Follows toe of rocks and debris line.
CRM wall & landing
Deck
CRM stairs
Guesthouse
40' Shoreline setback
TRUE NORTH
SCALE: 1"=20 FT.
EROSION 99 Sq.Ft.
55 36' 25.44
BOULDERS
WOODEN RAILING
CRM STEPS
RIP-RAP
TREE STUMP
CRM LANDING
CRM WALL (UNDER DECK)
CLEANOUT
EXPOSED 3"PVC PIPE
CONC. STAIR
SHORE LINE SETBACK
EXISTING SUNROOM/CABANA TO REMAIN
SHORE LINE SETBACK
FLOOD COMPLIANCE
PROPERTY LINE
EXISTING HOUSE TO BE RENOVATED
WOODEN FENCE
NEW CMU 6 FT FENCE WALL TYP.
EXISTING GARAGE TO BE REMOVED
ROCK WALL SEE DETAIL
ROCK STAIR
EXISTING CESSPOOL
LOT 6
14,590 Sq.Ft.
BEACH RESERVE
SHORELINE (TOE BOULDERS) AS OF 7/12/00
EDGE NAUPAKA
TOP BOULDERS
SHORELINE (TOE OF ROCKS) AS CERTIFIED ON 10/26/98
Shoreline as of 5/28/13 follows toe of rocks and debris
HALA
COCONUT
LOT 6-A
5,480 Sq.Ft.
No work in Shoreline Setback
Jan Mark
CHAIN LINK FENCE
LATTICE
EXISTING HOUSE TO REMAIN
AREA OF WORK IS THE CLOUDED AREA AND IS ONLY ON LOT 6 OUTSIDE THE 40' SETBACK.
LOT 7
CMU RETAINING WALL SEE DETAIL
CMU
REMOVE EXISTING WOOD STAIR
NEW SWALE SEE DETAIL
CONC. DRIVEWAY AREA 2,775 S.F.
EXISTING DRIVEWAY
SEPTIC TANK AND FIELD
PRIVATE ROADWAY
OWNED BY LOCAL LOT OWNERS (LOTS 1-8)
EDGE A.C. PAVEMENT
61-375A KAMEHAMEHA HIGHWAY
BENCHMARK
"Y" CUT ON CONCRETE
ELEV.= 18.09 m.s.l.
SIGNAL CORPS MANHOLE
LOT 6-A
5,480 Sq.Ft.
LOT 7-A
WOODEN FENCE CROSSES BETWEEN LOT 6-A & OLD RAILROAD RIGHT-OF-WAY
WOODEN FENCE
(OLD 40-Ft. RAILROAD RIGHT-OF-WAY)
SHOULDER OF KAM HWY 20.7
SITE PLAN
SCALE 1/16" = 1'-0"

Figure 2 is the site plan drawn by the architect James Matichuk that was approved by DPP in 2000 for renovation of the legal non-conforming house on the property. A full copy of the drawing will be included in Appendix B. The current 2013 shoreline has been added by surveyor Jim Thompson to indicate the most recent assumed shoreline in relation to the other structures. The structure on the south side of the property that from now on will be designated as 'guesthouse' was built in 1924. (Figure 2) The front part of the guesthouse and the attached deck are legal nonconforming structures, as they are located within the shoreline setback area. The appropriate building permit (#520250) was obtained by the previous owner and the legal non-conforming house was remodeled in 2001. At that time the floor of the portion of the house within the shoreline setback was raised to 19 feet above mean sea level (msl) to conform to the FEMA flood zone VE height of 18 feet. (Figure 3) The moss rock retaining wall is located directly below the deck supporting it. Attached and adjacent to the retaining wall are the CRM stairway and landing. The foundation of the house is within 12.9 feet of the retaining wall on one side and 13.9 feet on the other. According to the shoreline survey done by James R. Thompson in 2000 and 2013, the moss rock retaining wall, CRM stairway and landing are mauka (landward) of the shoreline. The second house on the property which was built in 1970 (permit #93730) is behind the 40 foot setback according to the 2000 and 2013 shoreline survey. (Figure 2)

Figure 3: 'Guesthouse' with Elevations



As stated previously, the property is part of Kawailoa Beach lots, Section "D" and is located 450

feet south of the public access, Leftovers and ½ mile north of Kawailoa Beach Park. The beach ranges 60-80 feet wide in front of the property and is made up of calcareous sand. The seaward edge of the shoreline is rocky, with a reef structure that is alternately submerged or exposed depending on the tide. Behind the reef lies a small area of protected water and sandy beach. Sand along this section has a seasonal cycle of accretion and removal. The two properties to the north and the two properties to the south of the subject property all have shoreline structures either in the form of rock revetment or CRM wall. (Figure 8) Underneath the sand is a layer of hard red clay (Waialua silty clay (WkA)). (USDA 1972) Under typical conditions this layer is covered with a layer of sand. The moss rock retaining wall and deck are anchored into the red clay with dowels and mortar. The retaining wall is made up of blue rock weighing about 25 - 150 pounds (median weight of 80) and is less than 6 feet in height all the way across. The specific height of the retaining wall ranges from 61 inches at the end closest to the stairs to a maximum of 63 inches at the opposing end as measured from the base of the CRM landing as requested by the Department of Planning and Permitting. The overall length of the retaining wall is 19.6 feet. The base of the retaining wall is 10 feet above mean sea level (msl). The CRM landing is made up of blue rock, mortar and rebar and serves as a toe for the seawall. Full height CRM buttresses (4' x1.5') spaced 5' on center behind the wall provide additional support from horizontal forces induced from high waves. (Figure: 4A) The retaining wall was built in line with the post and pier foundation of the legal nonconforming deck on the makai side of the deck. (Figure: 4A) There was minimal cut, only enough to place the 16 inch diameter rocks in place with the displaced dirt as the only fill behind it. The wall retains 24-33 inches of dirt which then the slopes up naturally to the foundation of the guesthouse. (Figure: 4) The height of the inside face of the wall is 60 inches with 27-33 inches open above the dirt that is retained. The retaining wall is there to protect the already existing footings of the legal nonconforming deck. No additional fill was added behind the wall the dirt follows the natural slope of the property. The 16"- wide moss rock wall supports the beach side edge of the legal non-conforming deck, while the remaining of the deck is supported on posts and piers at interior bays. The dimensions of the legal nonconforming deck are 19.6' by 15.2' by 19.6' by 14.1'. A 36 inch tall wood railing surrounds the legal nonconforming deck. The portion of the guesthouse within the forty foot setback includes the makai (ocean side) wall which is 16'11 ¾" and side walls of 14'5" and 16'8" respectively. The moss rock retaining wall protects the existing deck and house structure from tidal forces during periods of high wave action exceeding 30-40' in height, extreme storm surf and tsunamis. Weep holes are present in the retaining wall to allow any water collected behind the wall to be discharged to the beach. Figure 4 is a schematic technical drawing showing the moss rock retaining wall with the buttresses, footings, stairs and landing. Figure 4A is a horizontal schematic scaled drawing showing the post and pier foundation of the deck and alignment of the moss rock retaining wall with the existing footings of the deck.

Figure 4: Schematic drawing of the moss rock retaining wall, CRM stairs and landing

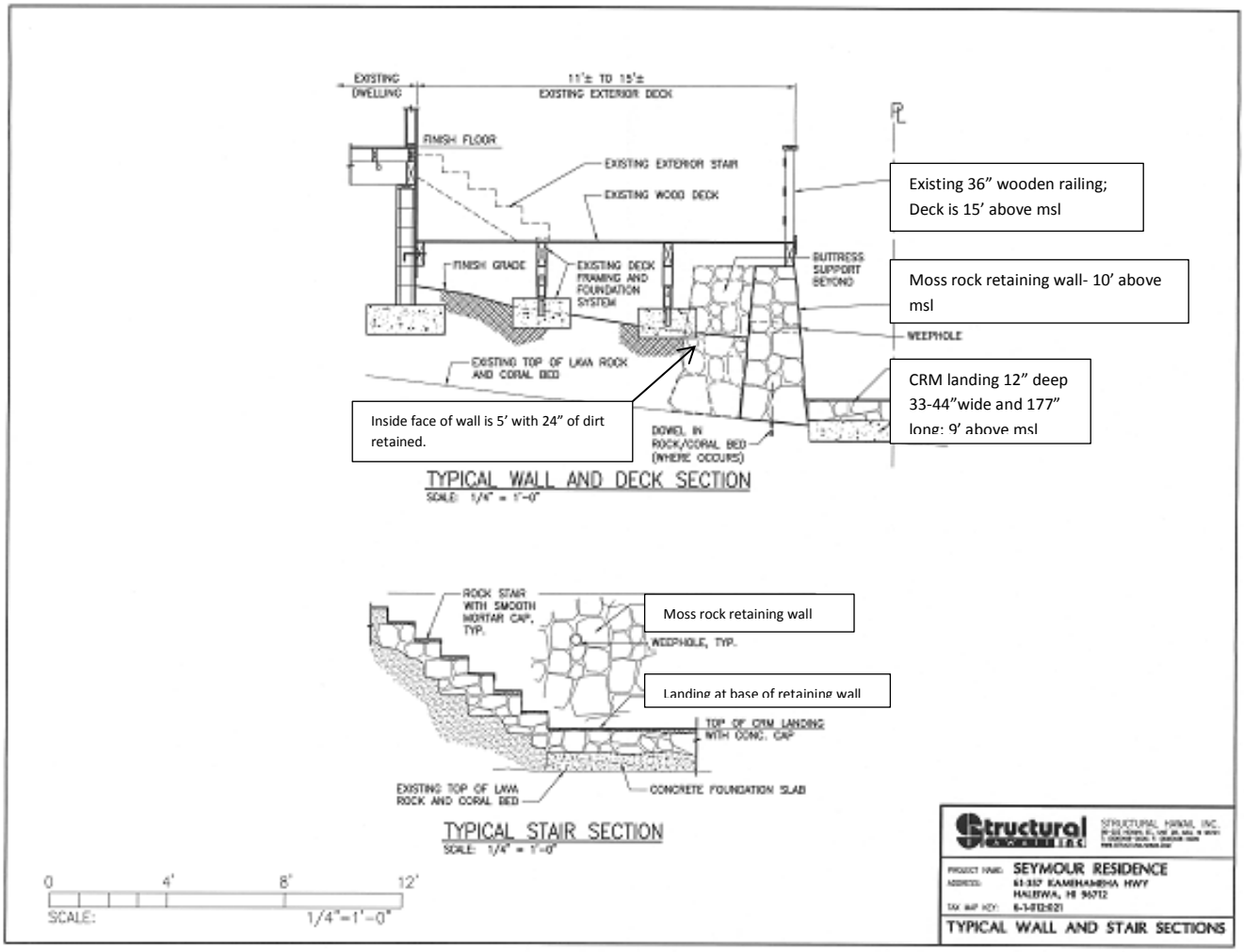
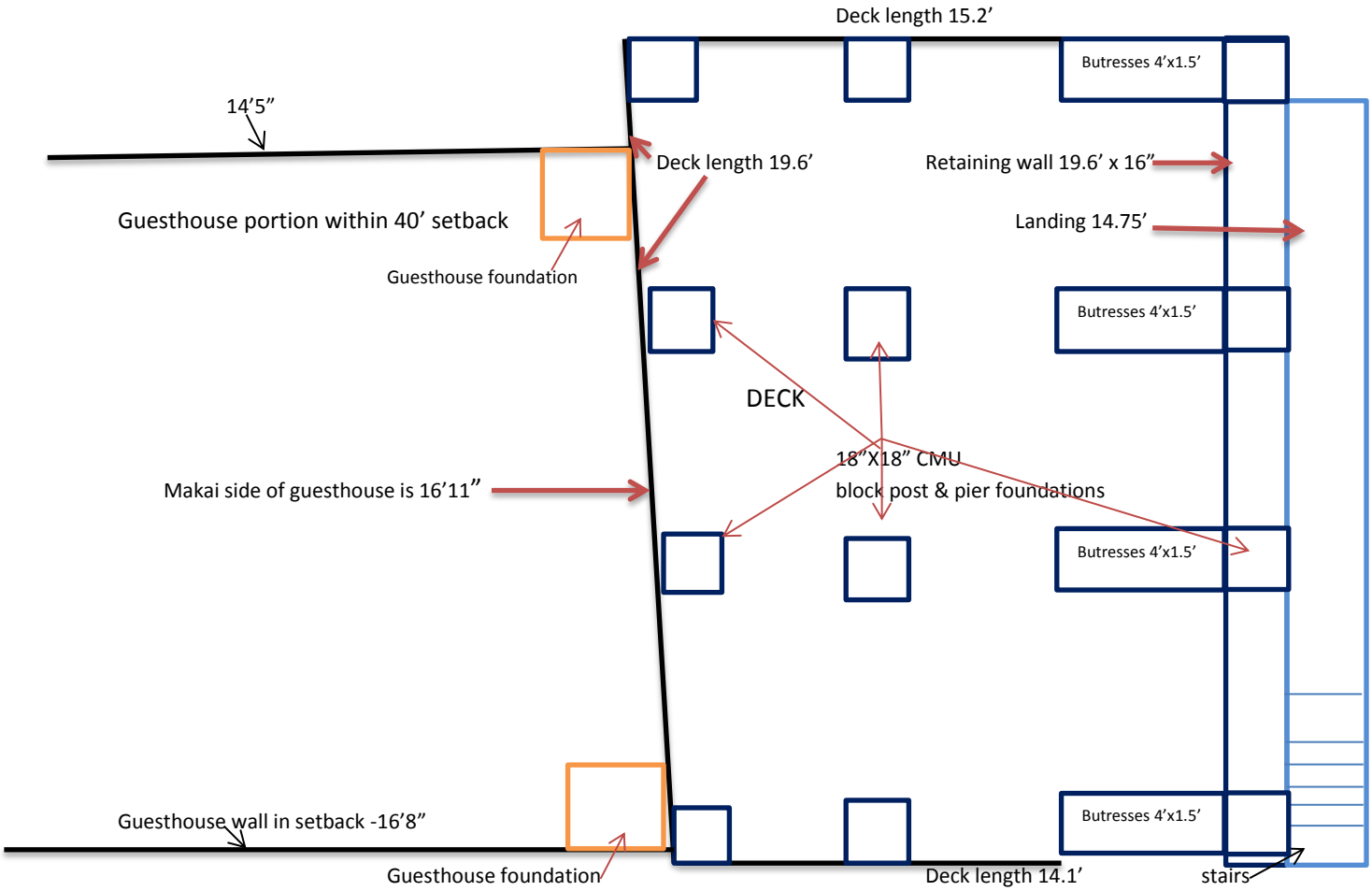


Figure 4A: Cross Section Schematic of Retaining Wall with Post and Pier Foundation and Buttresses



Scale: ¼ inch = 1.0 foot

Figures 5-7 are photographs of the CRM stairs, landing and retaining wall. The photographs were taken from the beach looking back at the property to show clearly the stairs, retaining wall and landing. The area included in the photos is the ocean side of the red box on the first diagram in Appendix B. At the toe of the retaining wall is the CRM landing which spans the length of the retaining wall and is 12 inches high, 33-44 inches wide, 177 inches long and is 9 feet above msl at its base. (Figure 6) The landing is connected to the stairs which are also constructed of rock and mortar. There are 6 stairs each with a rise of 7.75 inches. This includes the concrete cap. (Figure 5) The treads on stairs 1-5 are 15-16 inches and the tread on stair 6 is 29 inches. The stairs are 15 feet above mean sea level at their start and 10 feet 4.5 inches above mean sea level at the lowest stair. The stairs are 36 inches wide. The continuous horizontal landing provides additional sliding resistance at the base of the retaining wall and helps protect against possible damage to the wall due to scour and undercutting of the toe. Wave forces would be dissipated if they hit the raised rock landing. Because of the close proximity of the 'guesthouse' and deck to the shoreline, protection from erosion is essential. Undermining of the foundation of the guesthouse and damage to the deck by high surf events could create a potentially

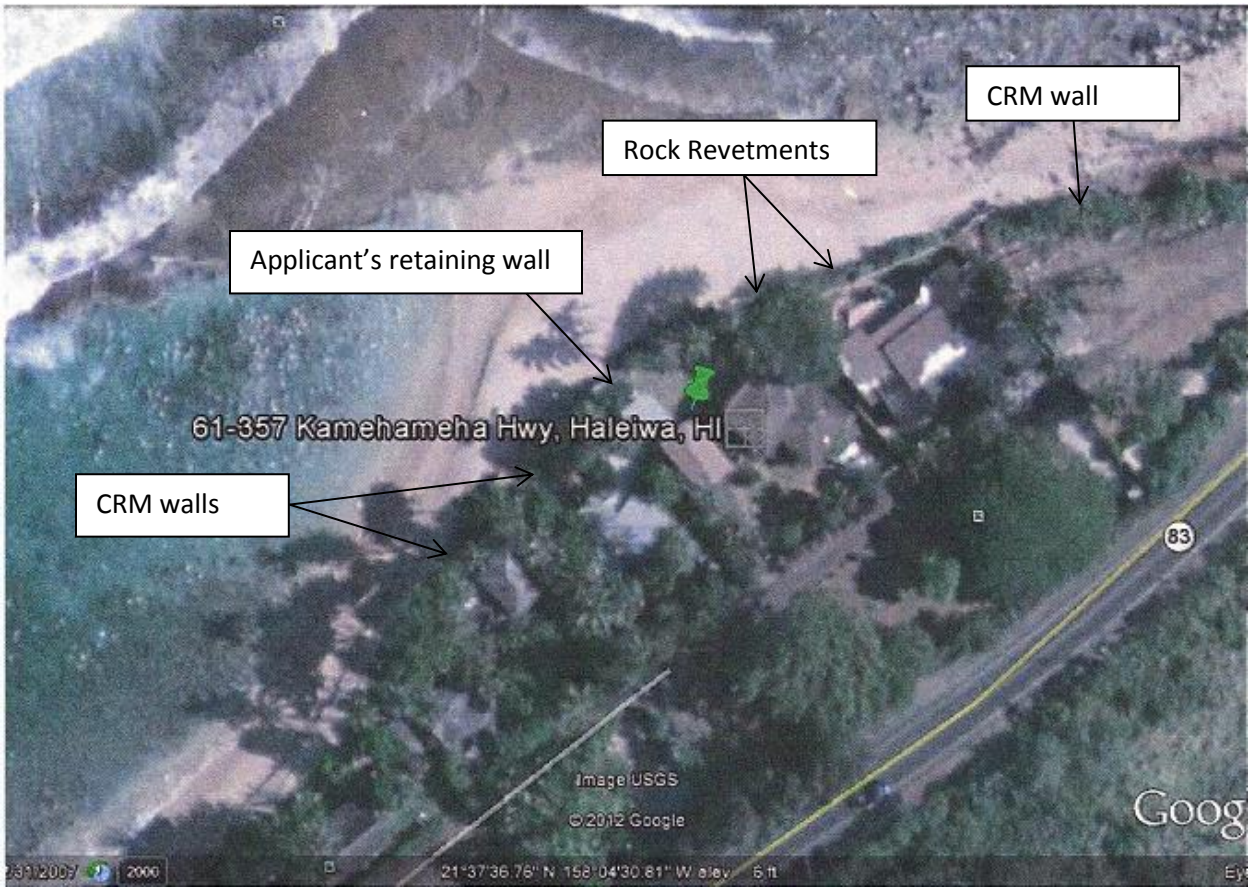
dangerous situation unless these structures are adequately protected. Also, safe access to the beach is needed as the applicant is visually handicapped. The applicant is striving to minimize any potential erosion or damage to the neighboring property to the south and is keeping in consideration the impact of such structures on the environment, shoreline, beach and marine life. The applicant and preparers have taken under consideration information from the Oahu Shoreline Study Part 1 & 2, COEMAP and "North Shore Sustainable Communities Plan", Land Use Principle and Guidelines in making this report and will show how it meets the criteria for shoreline setback variance in Chapter 23, Revised Ordinances of Honolulu. A Finding of No Significant Impact (FONSI) is anticipated. Thus, the applicant requests “as is” approval for moss rock retaining wall, CRM stairs and landing for shoreline setback variance with after-the-fact building permits.

Figure 5: Photo of CRM stairs

Figure 6: Photo of Retaining wall and CRM landing

Figure 7: Close up of Moss Rock Retaining Wall

Figure 8: Google Maps showing neighboring structures in relation to retaining wall



2.1 Shoreline Survey and Neighboring Shoreline Structures

The current shoreline survey was recently completed July 23, 2013. A preliminary site visit was done on May 28, 2013 by Andrew Bohlander of the Department of Land and Natural Resources along with the surveyor. Mr. Bohlander marked the line of the shoreline as seen on first diagram in Appendix B and in Figure 2. The moss rock retaining wall, CRM stairs and landing are marked on the drawing and are landward of the current shoreline. Two neighboring properties to the south have vertical CRM walls and to the north, a rock revetment and vertical CRM wall. (Figure 8)

3.0 Description of the Existing Environment

3.1 General Description

The northwest coast of Oʻahu extends from Kahuku Pt. to Haleʻiwa, and is characterized by massive winter surf, long sandy beaches, rocky points, and patches of exposed beach rock. The beach rock is particularly exposed in the winter, when foreshore slopes steepen and large quantities of sand are moved by high surf from the water's edge toward the back of the beach. Sand at the shoreline is mostly

coarse grained and calcareous, a signature of the high energy waves that impact this coast in the winter. Winter wave heights can reach up to 10-15 meters. In contrast, summer conditions on these same beaches are placid, and the steep winter shorelines are replaced by flat wide beaches. (http://www.soest.hawaii.edu/coasts/publications/hawaiiCoastline/oahu.html)

The applicant's property is down a private road owned by eight property owners. All the homes on this road are single family residences and the property is zoned R5 residential. It is not in a special district and its state land use is urban district. Most of the houses on the road have either rock revetments or CRM seawalls to protect their properties against erosion. The two properties without shoreline protection have significant erosion each year and can lose 3-4 feet of their property.

The closest public access is "Leftovers", approximately 450 feet north of the property. One-half mile to the south is Kawailoa Beach Park. Swimming access is to the north of the property at a large 'tide pool' and to front and south of the property in the sandy 'lagoon'. Beach rock and reef surround the 'tide pool' protecting it from the waves, and it is where many young children come to swim. (Figure 16) The 'lagoon' is bordered by the beach and exposed reef rim. (Figure 15) It has a circular current pattern where close to the reef, the current is flowing towards the beach then it turns after hitting the beach and flows parallel to shoreline until it reaches deeper water. With large surf, the currents can be quite strong.

The applicant's property is 15 feet above msl (mean sea level). Many of the properties along this stretch of Kawailoa beach have shore protection devices on their property. Without this protection, there is significant erosion of property by typical north shore high surf events. The applicant's legal non-conforming house's foundation is 13 feet from the moss rock retaining wall on one side and 15 feet from the other. Without the present retaining wall, the applicant would be at significant risk for erosion, damage to the existing deck and to the foundation of the house. Damaging erosion occurs along Kawailoa Beach when the surf reaches warning level heights, particularly at 30-40 foot wave heights (full face height). Given the configuration of the 3 reefs offshore, the waves at 30-40 feet, first break at the outer third reef about 300 yards offshore. The waves then continue to reform and break on the second reef and reef rim and become progressively smaller in size such that the size the wave reaching the shoreline is at most 1 to 1 ½ feet in size. The run-up and currents of the water on the shoreline are what cause the damage and erosion. These conditions have occurred December 6-8, 2006, twice in 2007 and once in December 2009. On January 29-30, 2007 and March 12-14, 2007 wave heights reached 40 feet or higher, and once in December 2009. There was significant erosion to neighboring properties that did not have shoreline protection.

3.2 Climate:

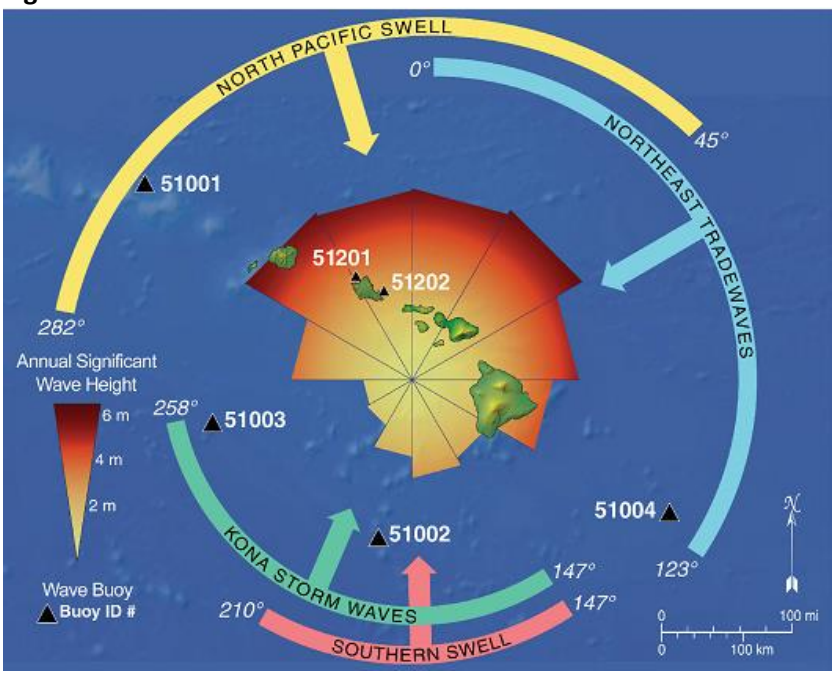
Hawaii's climate is known for its equable temperatures, moderate humidity, persistent breezes and abundant sunshine. The annual variation in mean monthly temperatures is only about 9°F. It is recognized that there is generally only two seasons in Hawaii, *kau,* the warm season and *ho'oilo,* the cooler season. The warm season is characterized by the position of the sun directly overhead and the winds from the northeast. The cooler season is characterized by more variable winds and increased rainfall. (Juvik and Juvik 1998)

Winds: The winds in the Hawaiian Islands are the most important of all the weather elements because of their speed, their ability to form waves and their effect not only on shoreline processes but small craft

and marine operations.(Fletcher 2012) Trade winds from the northeast (NE) account for 75% of the total winds year round and are generated by high pressure systems. Winds from the southwest, southeast and northwest occur 10% of the time each. Seasonally, the trade winds are more dominant in the summer occurring 80-90% of the time June through August due to anticyclonic flow around the North Pacific high. Winter time due to the increase in low pressure systems and the weakening North Pacific high, trade winds occur only 40-60% of the time with Kona winds (southerly and westerly winds) increasing in prevalence and occur approximately 17% of the time in the winter months. (Fletcher 2012; AECOS 1981) Kona winds can be light and variable to gale or hurricane strength.

Waves: Hawaii is known for its year round surfing. Waves are created by wind blowing across the water. Swells from all directions reach Hawaii's shores, but there are only four basic swell sources: east-northeast trade winds, North Pacific lows, South Pacific lows and Kona storm waves. (Haraguchi 1979; Fletcher 2012) (Figure 9) The most important waves for the applicant's property are the Northwesterly swells. These waves occur mainly in the winter season October through March. The waves are generated by North Pacific lows, storms or gales with very large, strong northwest winds. Swells generated in the 'fetch area' travel hundreds of miles before reaching Hawaii. The northern and western coastlines are affected by these waves, particularly Oahu's north shore. The applicant's property is less affected by waves generated by trade winds or Kona winds and is completely unaffected by waves generated from South Pacific lows that occur predominantly in the summer season.

Figure 9 Wave Patterns in the Main Hawaii Islands



Source: Vitousek 2008

Tides: Tides in Hawaii are mixed semi-diurnal with the most extreme ranges occurring near and following the solstices. The average tidal range is about 2 feet and the maximal tidal range is 3 feet in the spring when the gravitational pull of the sun combines with the pull of the moon to create higher tides.

General Tide data taken from EM 1110-2-1100 for this site is as follows, based on a mean lower low level (MLLW) datum:

Mean Higher High Water	1.90
Mean High Water	1.40
Mean Sea Level	0.80
Mean Tide Level	0.80
Mean Low Water	0.20
Mean Lower Low Water	0.00

Translating the data to values based on a mean sea level (MSL) datum:

Mean Higher High Water	1.10
Mean High Water	0.60
Mean Sea Level	0.00
Mean Tide Level	0.00
Mean Low Water	-0.60
Mean Lower Low Water	-0.80

Air quality:

The remoteness of the Hawaiian Islands from any large sources of industrial pollution keeps the surrounding air relatively clean. The volcanoes are the predominant source of air pollution at this time. Sulfur dioxide, carbon dioxide, carbon monoxide and other emissions from the volcanoes increased in 2008. The air quality at the applicant's property is not affected by the volcanic haze or "Vog" unless Kona winds are present. The only other source of pollution in the project vicinity area is car emissions from traffic on Kamehameha Highway.

3.3 Geology:

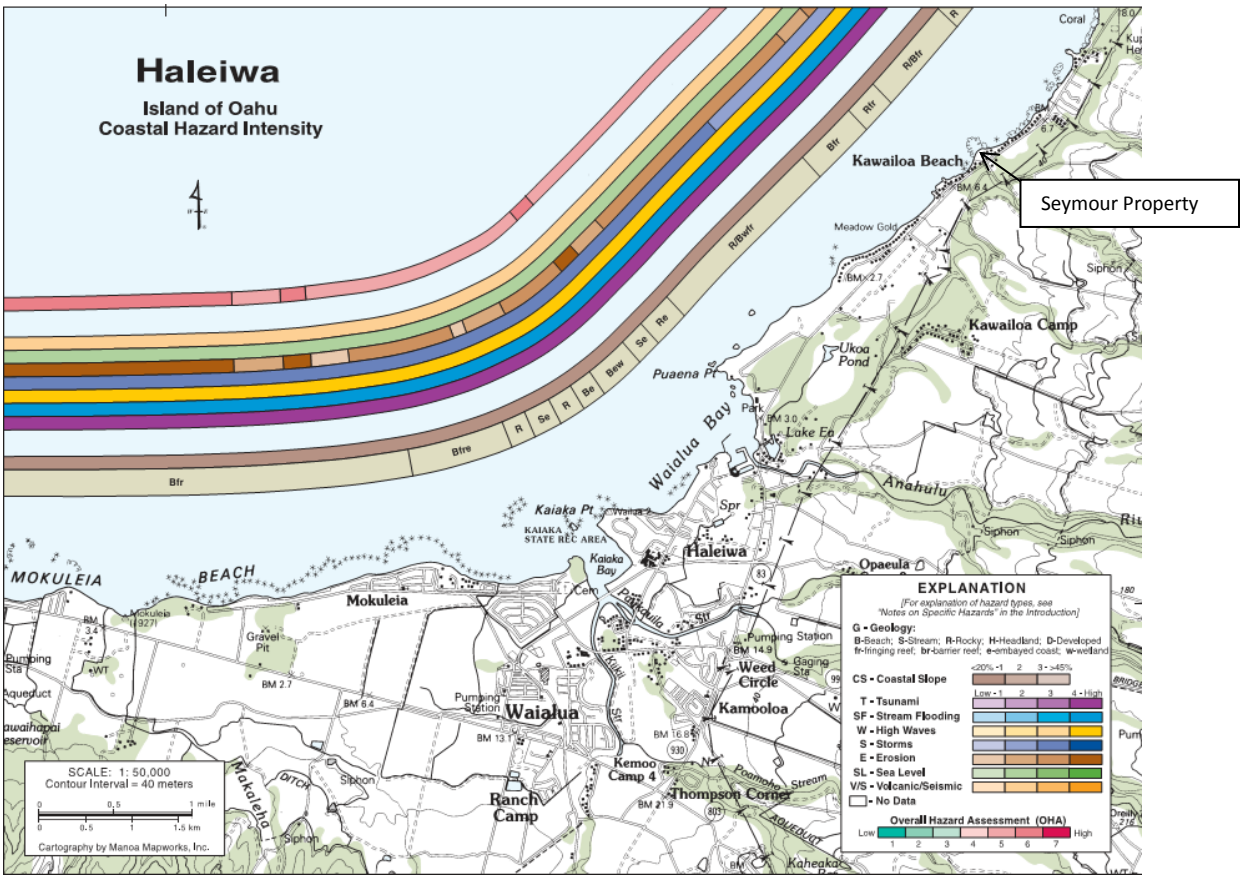
Oahu is made up of the eroded remnants of two extinct volcanoes, Ko'olau on the east and Wai'anae on the west. The island is divided into four main areas, the Waianae Range, the Koolau Range, the Schofield Plateau and the coastal plains. The coastal plains adjacent to the ocean formed from coral reefs and alluvial sediments. (USDA 1972; Fletcher 2012) From Puena Point to Waialee the coastal plain is narrow 10 to 30 feet above sea level and composed largely of fossiliferous limestone and unconsolidated sand. (Fletcher 2012) Inland is a cliff a few hundred feet high, probably cut as an old sea cliff against the northwest flank of the Koolau Range during the higher sea level when the coastal plain was formed. (Moberly 1963) The area on the North Shore where the applicant's property is located was originally formed from lava flows from the Ko'olau Volcano. Silty clay and silty clay loam are the type of soils found in Haleiwa on the North Shore of Oahu, extending up to Sunset Beach and at Wahiawa. (USDA 1972) On the applicant's coastal property the top layer is sandy from its location just mauka of the shoreline. Below the sandy top soil is a layer of hard, red silty clay known as Waialua silty clay, which has a blocky structure. The anchors and footings of the retaining wall are in the red clay layer for stability. See appendix A for engineering report.

3.4 Coastal Hazards

Coastal Hazards include floods, hurricanes, high waves, tsunamis and erosion. The coastline at Kawailoa Beach consists mostly of interspersed sand beaches and 3-6ft. rocky escarpments of basalt or limestone. This is a high wave-energy coastline that receives some of the largest breaking waves in the state.

According to the USGS coastal hazard intensity, the coastline in front of the applicant's property has an Overall Hazard Assessment (OHA) of 5-moderately high. (Figure 10: Map of Coastal Hazard Intensity). The overall hazard assessment (OHA) is calculated using a mathematical formula which takes into account more dynamic hazards (volcanism, seismicity, coastal stream flooding, seasonal high waves, marine over wash, tsunami inundation and high winds) versus lesser hazards (sea level rise and beach erosion). The dynamic hazards constitute a greater risk and thus are given more weight in the formula. The result of the calculations is then used to assign a nominal overall hazard rank on a scale of 1-7 with 1 being very low overall hazard assessment (OHA) to 7 being a very high overall hazard assessment. The greatest risk to the applicant's property is from seasonal high waves and tsunami inundation. (USGS Oahu Atlas of Natural Hazards)

Figure 10: Coast Hazard Intensity Map



Source: USGS Oahu Atlas of Natural Hazards

3.4.1 Flood Zone:

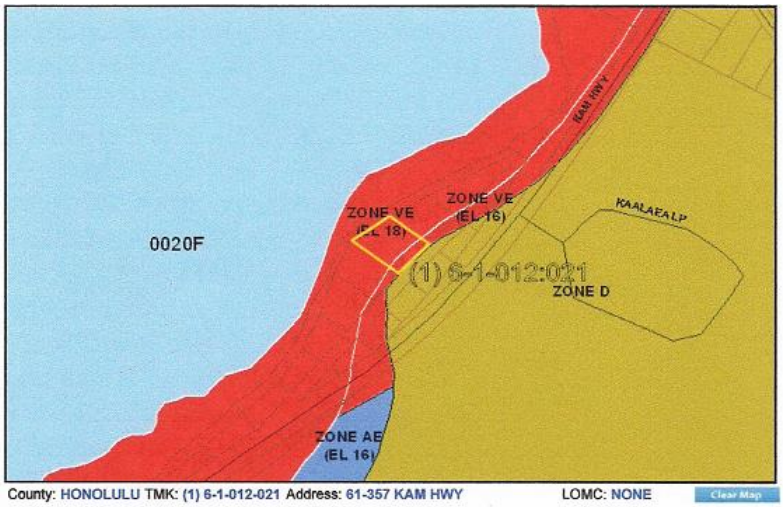


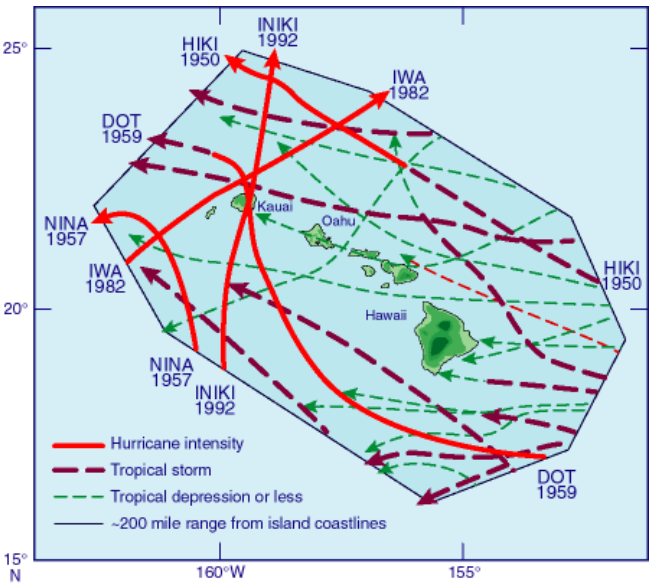
Figure 11: Flood Zone Map of the Seymour's Property

The applicant's property is zoned VE per FEMA flood designation. The applicants deck is 15 feet above msl (mean sea level). The floor of the legal nonconforming portion of the 'guesthouse' was raised to 19 feet above sea level when renovations were done in 2000 to conform to FEMA flood standards. The base of the moss rock retaining wall is 10 feet above msl and the base of the landing is 9 feet above msl. The stairs range from 10'4" above msl to 15' above msl.(Figure 3) (*http://gis.hawaiinfip.org/fhat/*)

3.4.2 Hurricanes:

Figure 12: Tropical Storms and Hurricanes from 1950 to present

Source: USGS Oahu Atlas of Natural Hazards



Tropical storms and hurricanes are rare events in the Hawaiian Islands, and they are most likely to occur during periods of highest sea surface temperatures, between July and September. Figure 12 depicts the paths of tropical storms and hurricanes that have passed close to the Hawaiian Islands since 1950. Studies of Hawaiian hurricane records conclude that all of the main islands have been affected by hurricanes, and no island is without risk. Hurricanes most often approach the islands from the east, south. In the last 50 years three hurricanes have contacted the Hawaiian Islands, all of them directly impacting Kauai. Hurricane Dot(1959), Iwa(1982), and Iniki(1992). Wind, storm surge and waves are the main threat. The applicant's property and structures are 19 and 23 feet above msl. However, without the retaining wall the surge and waves could be quite hazardous to the existing house, foundation and deck on the property.

3.4.3 High Waves:

As described above, Hawaii receives high waves from distant storms in the northern and southern hemispheres and from tropical cyclones passing in the vicinity of the island chain. Most important for the applicant's property are high waves generated by storms in the northern hemisphere. Hazards associated with high waves include debris over wash, flooding, erosion, high wave energy, strong currents and turbulence in the near shore zone. The largest waves that reach the north shore of Oahu generally arrive in the winter as a result of intense storm activity in the North and Northwest Pacific. The high amplitude and long wavelength associated with these swells create very large waves with considerable energy. On the north shore of Oahu, the annual recurring near shore wave heights of 15-20 feet is commonly seen. Larger wave heights of 30-50 feet are less common, but occur regularly every few years. Wave heights of 50 feet have been reported in December 1969, January 1998 and December 2009. From a study done by Pat Caldwell, 2008 analyzing buoy data from 1981-2007 it was found that marginal run-up events which are represented by surf 9 meters (29.5 feet) in height and tides > than 1 σ (standard deviation above the mean) have occurred on average 10 times a year since 1981. Significant episodes, represented by surf 12 meters (39 feet) in height and tides > 1.5 σ have occurred on average once annually. Extreme high wash occurrences are related to surf 15 meters (49 feet) in height and tides > 2 σ or surf > 18 meters (59 feet) and tides > 1 σ have happened on average once every seven years.(Caldwell 2008) The strongest high seasonal wave inundation in the last 50 years occurred from back to back extreme episodes during December 1-4, 1969. There was significant damage to several of the properties along Kawailoa Beach from that storm including the applicant's property. (Source: verbal report from neighbors)

Table 1: Large Wave Events on Oahu's North Shore:

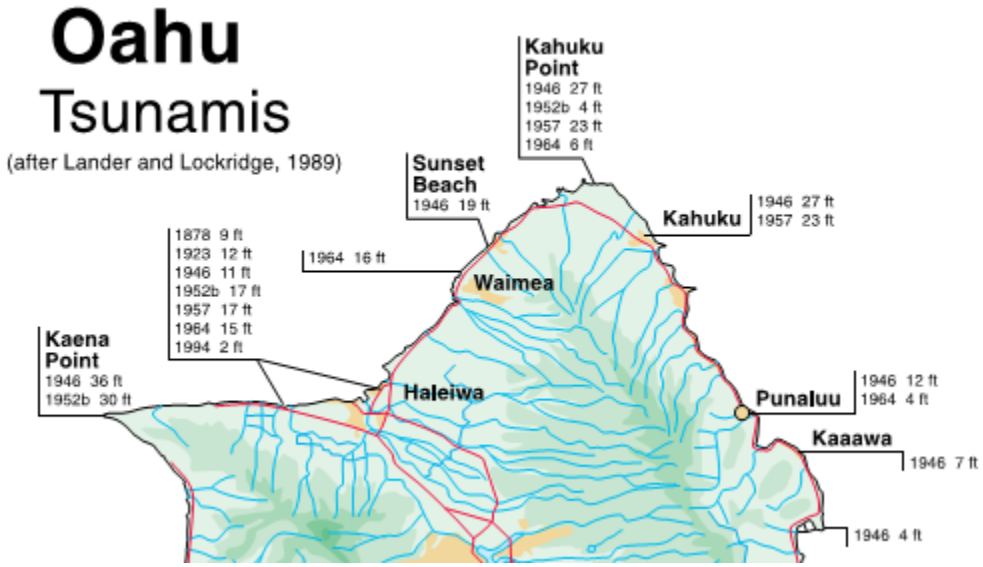
1967 Nov.	30ft	
1969 Dec.	50ft	(Very damaging, some of the properties along Kawailoa Beach had severe erosion and property damage from this storm and high surf event; Hwang 1981)
1974 Nov.	30ft	
1978 Jan.	25ft	
1982 Nov.	Hurricane Iwa	
1985 Dec.	30ft	
1986 Jan.	25-35ft	
1989 Nov.	30ft	
1998 Jan.	25-40ft	
2007 Jan.	>30ft	
2007 Mar.	>30ft	
2009 Dec.	40-50ft	

3.4.4 Tsunamis

Tsunamis are a series of waves of very long wavelengths (100's km) and periods (10's minutes- 1 hour or more) that can travel up to 1000km/hr. in the open ocean. They are caused by disturbances that displace large volumes of water and are usually generated by seafloor displacement during earthquakes

and submarine landslides. (Vitousek et al, 2009). Approximately 50 tsunamis have been reported in Hawai'i since the 1800s. Twenty-seven tsunamis with flood elevations greater than 3.3 feet (1m) have made landfall in the Hawaiian Islands during recorded history and 11 of these have had significant damaging effects on Oahu. The Tsunamis' of 1946, 1952 and 1957 generated flood levels of 14, 13 and 13 feet, respectively along the Haleiwa coast. (Loomis 1979, AECOS 1981) (Figure 13) The most recent significant tsunami to reach Oahu was in March, 2011 from the 9.0 earthquake in Japan. In Haleiwa Harbor, the water level with tide at first arrival was 7.06 feet and there was damage to boats and piers in the harbor. At the applicant's property, Mr. Seymour personally witnessed the water level as a result of the tsunami rise to the upper CRM stair level, a level of approximately 5 feet. There was no damage to the applicant's property from this tsunami, but the tsunami contacted the retaining wall and without its presence, there could have been potential damage to the deck and foundation of the house. The applicant's property is in the tsunami evacuation zone.

Figure 13: North Shore Recorded Tsunamis from 1878-2005



3.4.5 Erosion-

The shoreline at Kawailoa Beach is composed of carbonate sand, limestone, and basalt. Outcrops of beach rock are common. A historical perspective of erosion on Kawailoa Beach is given by Dennis Hwang, in his 1981, *Beach Changes on Oahu as Revealed by Aerial Photographs* which shows the varying changes in vegetation, sand and erosion from 1949 to 1975. As the title would suggest, he used historic aerial photographs to chart this change. The applicant's property is in transect 10 within Kawailoa Beach. (photomap 7, p.20 Hwang, 1981). Overall this area has shown accretion of vegetation +5 and sand +4, however in 1969 when there was a very large storm with waves in excess of 50 feet, there was "erosion of the vegetation and much structural damage on Kawailoa Beach". (Table 2) In 1969, the

guesthouse did sustain some damage due to the high surf, as there was no retaining wall at that time. Since that time, shoreline certification maps have shown pockets of erosion that occurred from 2000-2013, 91 square feet by the landing. (Figure 2)

Table 2: Erosion Data for Kawailoa Beach

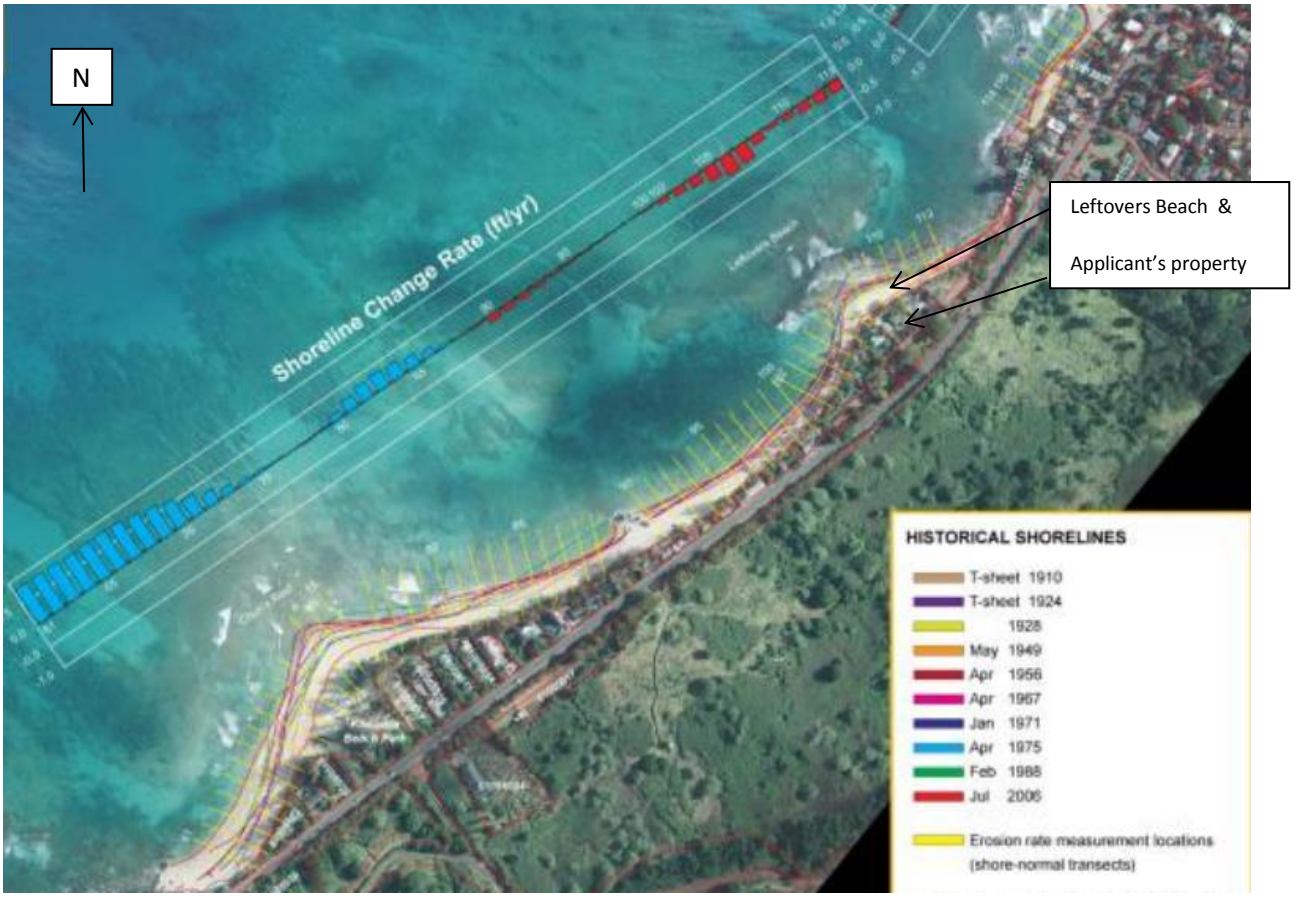
	Transect Number										
Observation Period	1	2	3	4	5	6	7	8	9	10	11
May 08, 1949 - Aug 24, 1962	*	+4	+6	*	+7	+5	*	+11	*	-3	+23
Aug 24, 1962 - Apr 22, 1967	0	+1	+1	-2	0	+5	+3	+3	+5	+7	+13
Apr 22, 1967 - Jan 23, 1971	-2	-1	-4	-3	-7	-12	-13	-7	-12	-2	-42
Jan 23, 1971 - Apr 11, 1975	-4	-4	-1	-4	+2	+3	+10	+2	0	+3	+10
Net Change - Vegetation Line	-6	0	+2	-9	+2	+1	0	+9	-7	+5	+4
Range - Vegetation Line	6	5	7	9	7	12	13	14	12	8	42
Net Change - Water Line	*	+2	+4	-57	+46	+41	-30	-1	+6	+4	+4
Range - Water Line	*	68	39	57	46	104	30	29	17	45	20

**No data*
Net change is the total change in the position of a beach index line between the earliest and most recent observation year.
Range is the difference between the observed extremes in the position of a beach index line.

Source: Hwang 1981

The most recent published long-term (1910-2006) shoreline change rates at Kawailoa are low on average, less than 1 foot per year. (SOEST 2011) However rates at Kawailoa have high uncertainty due to short-term (seasonal to daily) variations in shoreline position caused by large winter swells from the north and northwest and persistent tradewind waves year round. Though long term rates are low short-term erosion is a significant hazard to beach-front homes especially in winter with run up from large waves. The most recent map shows a slight loss of the shoreline -0.5 feet in front of the applicant's property. (ftp://soest.hawaii.edu/coastal/webftp/Oahu/posters/KawailoaSTsmoothTMKPoster72.jpg) (Figure 14)

Figure 14: Erosion Map of Kawailoa Beach



Source: http://www.soest.hawaii.edu/coasts/erosion/oahu/index.php

3.4.6 Seismic Activity:
Both sea level rise and seismic activity are ranked moderately low throughout this area. (Oahu coastal hazard intensity).

3.5 Beach/Marine Environment

The applicant's property is at the north end of Kawailoa Beach, 450 feet south of Leftovers public beach access. The beach is bordered by Kawailoa Beach Park to the south and Leftovers public beach access to the north. The property is located where the beach comes to a small point. (Figure 8) The width of the beach makai of the applicant's property ranges from 60-80 feet in width. Beneath the sand is a red rock bench that extends mauka onto the applicant's property. The shoreline is composed of calcareous sand and exposed beach rock with a shallow, limestone rock reef that runs along the shoreline and out to border a place of ocean access. (Figure 15) The limestone rock reef which is exposed at low tide is 150 feet wide and extends 450 parallel to the shoreline creating a lagoon like area.

Beyond and attached to this reef, in 3 feet of water, is another flat, wide limestone rock reef

approximately 200 feet wide and over 500 feet long that parallels all of Kawailoa Beach. Beyond this is a third reef that is located in deeper water approximately 900 feet offshore. The reef is mainly limestone with about 15% coral. There is one large sand channel off shore just to the north of the property, and several small surge channels in the limestone reef. Swimming access for the public is at two locations, first, a large 'lagoon' in front and to the south of the property and second, a large rock lined pool to the north of the property .(Figure 15,16). Both areas are protected by the shallow, limestone, rock reef, and this beach has been nicknamed locally as 'baby beach' given the protection from waves and pounding shore break by the reef. The bottom of the lagoon is sand bottom with numerous scattered rock boulders. The shoreline is quite protected by this reef in this area except for high energy storm waves greater than 30 ft. which occur occasionally during the winter season. Towards the south of the property where the flat, limestone reef ends, the shoreline is much more exposed to breaking waves and erosion.

Figure 15: Swimming Access #1 (lagoon) & Reef

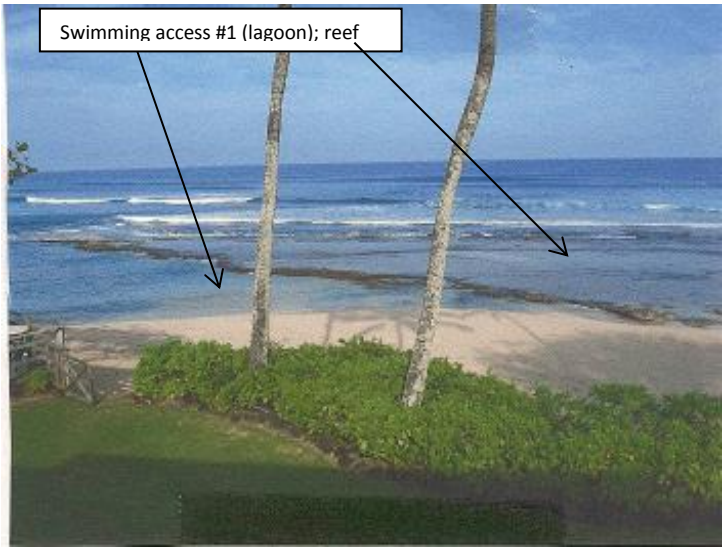


Figure 16: Swimming Access #2

Kawailoa Beach has predictable and stable shoreline sand movement. This movement occurs mostly in the winter season and is due to high energy storm waves. Directional sand movement is dependent on swell size and direction. During the high surf season, October through March, swells are predominantly from the north with either a more westerly component or easterly component. When the swell is predominantly from the west-northwest direction, waves and currents deposit sand at the northern end of the beach in front of the applicant's property. An exception to this is when the waves are 30-40 feet in height, and then sand is removed from the beach, exposing beach rock. The sand returns soon after the swell has decreased in size. When the swells have a more north-easterly component, the sand movement is to the south and accumulates at the south end of Kawailoa Beach at "Chun's Reef".

3.6 Water Quality

The Hawaii Department of Health water quality regulations classify near shore waters as Class A open coastal water. After heavy rains there can be storm run-off that discolors the water with red sediment. (AECOS) The source of storm run-off is primarily from Waimea River.

3.7 Near shore Environment

The near shore and offshore environment at the applicant's property is not designated a critical habitat or part of a marine conservation district. The closest Marine Life Conservation District is Pupukea Marine Life Conservation District 1 mile to the north. Reefs on Oahu tend to be fringing with reef rim and reef flats. Because the water temperature is close to the lower limit for reef-building coral, their effects in building up reef is less than in other tropical zones. (Pollock 1971; Jokiel 2001). Off Kawailoa Beach, the reef is irregular with sand patches and a few small channels. The coral reef communities along Oahu's north-facing shore are poorly developed due to the large swells that strike this coast during the winter months. Coral cover is relatively low approximately 15% and consists mainly of encrusting species that are wave resistant. The most common corals are *Porites lobata* and *Pocillopora meandrina.* Encrusting corals such as *Leptastrea purpurea*, *Pavona varians* and *Montipora flabellata* are found throughout the area. (Jokiel 2001) NOAA's Center for Coastal Monitoring and Assessment has used digital benthic habitat maps to monitor existing Marine Life Conservation Districts (MLCDs) and adjacent habitats. The North Shore area on Oahu included in this study ranges from Sunset Beach south to Kawailoa Beach including Pupukea MLCD. Overall, the most abundant substrate type was turf algae followed by sand, coral, macro algae, coralline algae, macro invertebrates and sea grasses. The top 10 benthic taxa/substrate types by percent cover in the open access area which includes the benthic area at Kawailoa Beach are listed in the table below. (Friedlander 2006)

Table 3: Top 10 Benthic Substrate Types

	Open Access	
Substrate Type	Taxon	%
Turf algae		52.8
Sand		33.7
Coralline algae		3.7
Macroalgae	*Microdictyon sp.*	1.8
Coral	*Porites lobata*	1.3
Macroalgae	*Halimeda sp.*	0.9
Macroalgae	*Galaxaura sp.*	0.8
Coral	*Montipora capitata*	0.7
Macroalgae	*Acanthophora sp.*	0.7
Macroalgae	*Turbinaria sp.*	0.7

Source: Friedlander 2006

3.8 Nekton

There are 557 documented species of reef and shore fish in Hawaii of which 135 are endemic. Herbivores account for over 70% of the total reef fish biomass followed by invertebrate feeders (13%) and plankton feeders (9.7%). Surgeonfish are the dominant fish group and predators are rare, accounting for only 3.8% of reef fish biomass. (Brainard 2002) The highest number of fish and the greatest species diversity are found in locations with moderate to low wave exposure and greater habitat (reef) complexity to provide shelter from predation. (Jokiel 2001)

Table 4: Top 10 Species of fish in the North Shore Oahu Open Area

Taxon Name	Common Name	Hawaiian Name
Thalassoma duperrey	Saddle Wrasse	*hinalea lauwili*
Acanthurus nigrofuscus	Brown Surgeonfish	*maiii*
Acanthurus leucopareius	Whitebar Surgeonfish	*maikoiko*
Stegastes fasciolatus	Pacific Gregory	
Parupeneus multifasciatus	Manybar Goatfish	*moano*
Rhinecanthus rectangulus	Reef Triggerfish	*humuhumunukunukuapuaa*
Acanthurus triostegus	Convict Tang	*Manini*
Coris venusta	Elegant Coris	
Stethojulis balteata	Belted Wrasse	*omaka*
Acanthurus dussumieril	Eye-stripe Surgeonfish	*palani*

Source: Friendlander 2006

3.9 Protected Marine Species:

Under federal law, all marine mammals are protected under the Marine Mammal Protection Act (MMPA). Some marine mammals, including humpback whales and Hawaiian monk seals, also are protected as endangered species under the federal Endangered Species Act (ESA). ESA protection extends as well to all species of marine turtles that occur in Hawaiian waters.

Humpback whales (*Megaptera novaeangliae*) congregate in Hawaiian waters during the winter months for mating and giving birth. Although frequently seen in waters off the Kona coast, Humpbacks seldom venture into waters shallower than 20m. Hawaiian Monk Seals, Ilio-holo-i-ka-uaua**,** (*Monachus shauinslandi)* are among the most critically endangered mammals, and they will haul out on beaches and rocky shores to rest. The Monk Seal population is highest in the Northwestern Hawaiian Islands, but a growing number of seals inhabit the Main Hawaiian Islands (MHI). (Baker 2011) Occasionally a Hawaiian monk seal will haul out on the beach near the 'lagoon' for a day, usually 2-3 times a year. The closest Hawaiian monk seal birthing location is north of Turtle Bay. The existing retaining wall and landing in no way hinder or impede the seals in any way.

Humpback whales can be seen in the distance in the offshore waters from the applicant's property.

Green sea turtles (*Chelonia mydas)* which are protected by State and Federal laws are common in the near shore waters, but there are no local nesting sites near the applicant's property. The retaining wall and landing in no way hinder or impede the turtles from hauling out onto the sand.

No nesting seabirds occur on or near the property, retaining wall, stairs or landing. Close to Kawailoa Beach Park, to the south, is a seabird nesting area.

3.10 Terrestrial Ecosystem:

The property has been a residence since 1924. Existing flora within the shoreline setback area are two coconut palms, *Cocos nucifera,* Seashore Paspalum (*Paspalum vaginatum*), and beach naupaka, *Scaevola taccada.* The property is classified as urban. Animals commonly seen on the property include the Indian Mongoose (*Herpestes auropunctatus*), feral cats (*Felis catus*), common house mouse (*Mus musculus*) and the Polynesian rat (*Rattus exulans*). It is unlikely that there are any endangered species present on the applicant's property.

3.11 Socioeconomic Environment:

The property is located in a fully developed residential neighborhood, Kawailoa. The property is zoned R-5 residential in urban district. It is located within the North Shore Development plan area. The closest elementary school is Haleiwa Elementary and the high school, Waialua High School. The property is located in the Haleiwa CDP and in the 2010 census, the population was 3,970. Haleiwa is the largest commercial center on the North Shore of the island and is a popular destination for tourists and residents for surfing and diving.

3.12 Cultural Environment

3.12.1 Cultural History of the area:

According to the models from Kirch (1985) and archival historical research from Kepā Maly (2000), the Hawaiian archipelago was thought to be first settled or colonized in A.D. 300-500 by ocean voyagers possibly from the Marquesa Islands. It wasn't until 1778 that James Cook 'discovered' the Hawaiian Islands by landing in Kauai, thus breaking the barrier between Hawaiian civilization and the outside world. Conservative estimates of the Hawaiian population at this time were 200,000. (Kirch, 1985). Pre-European contact, the Hawaiian economy was centered upon agriculture and fishing. Whole islands or parts of islands were divided into independent chiefdoms called "*moku*". The lands were divided into large radial sections called *ahupua'a* which extended from the ocean shoreline to the mountains or some other feature of geological significance (Maly 2000). Each of the *ahupua'a* was controlled by lesser chiefs (*ali'i'ai ahupua'a*) and stewards (*konohiki*) (Kirch 1985).

Oahu was one of the most fertile and densely populated islands and boasted far more extensive areas of taro pond field irrigation than either Maui or Hawaii. There were six large land divisions in ancient O'ahu, each having a source of fresh water for all the *ahupua'a* within a *moku*/district, and access to

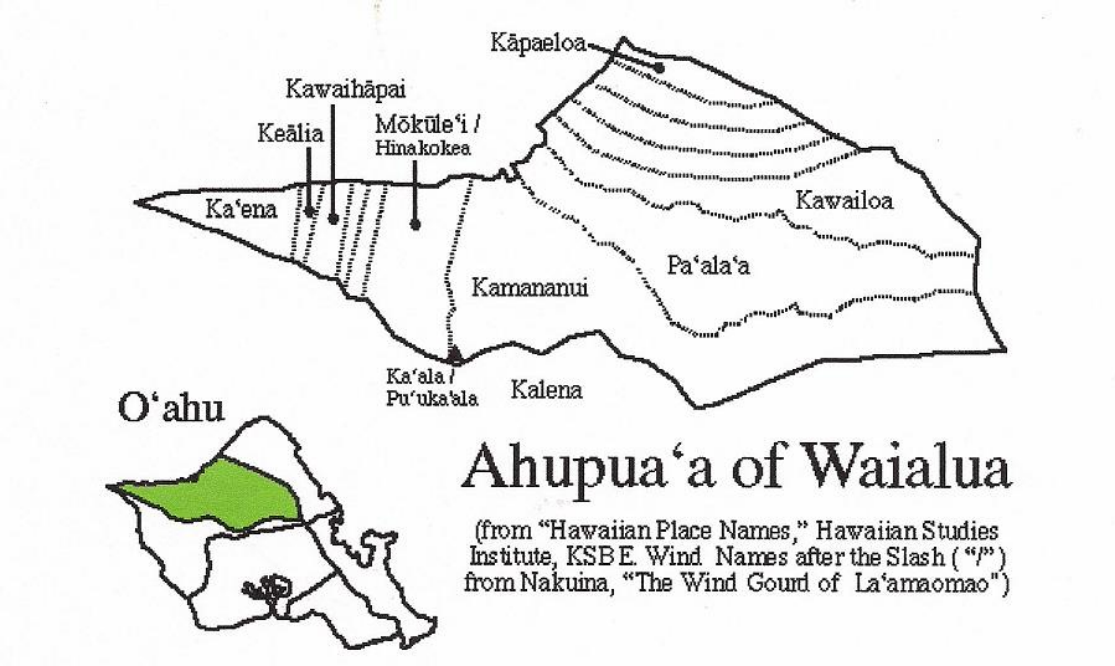
each area of resource, from reef to coast to midlands and mountains. The Waialua *moku* ranged from Kaena Point in the west to Kapaeloa at Waimea Bay. There were nine *ahupua'a(s)* within the *moku.* The *ahupua`a(s)* from west to east were Ka`ena, Keālia, Kawaihāpai, Mōkūle'i (or Hinakokea), Ka'ala (or Pu'uka'ala), Kamanaui, Pa'ala'a, Kawailoa, and Kāpaeloa. (Figure 17) Ancient Hawaiian communities thrived at both the Anahulu River Valley and Waimea Valley locations. (http://apdl.kcc.hawaii.edu/oahu/stories/waialua/index.htm) The Anahulu Valley in the Waialua District was known for extensive taro fields and fishponds that provided food and goods used by the Ka`ahumanu Chiefs to support their establishments and to use for trade with the Europeans in the nineteenth century. (Kirch 1985) The Waimea Valley was the site of the High Priest of Oahu for over 600 years. The last was Hewahewa, the Kahuna nui under the reign of Kamehameha I, whose bones remain at Waimea Valley.

In the mid-1800s, the ancient kahuna landsystem was overthrown in a great land division known as the "Great Mahele". With private ownership came the sugar cane and pineapple plantations which dominated the economy for 100 years.

The applicant's property is located in the Kawailoa *ahupua'a.* (Figure 17) The closest cultural and archaeological sites to the applicant's property are Waimea Valley, 2 miles to the north and the fishpond, *Lokoea*, at the mouth of the Anahulu River 3 miles south.

The sea and its resources were of equal importance to the land to the Hawaiians. Most of Oahu's reefs are fringing and the shore line or "littoral fringe" was heavily exploited by the Hawaiians for its invertebrates and seaweeds. The shore zone was also a source of edible sea urchins. Most Hawaiian fishes as well as lobster and octopus frequent the inshore zone of reef development within 30 meters. This area was commonly fished by Hawaiians who developed a range of gear and techniques suited to capturing inshore fish. (Kirch 1985) Hooks were shaped from bones either human, dog or bird, pearl or turtle shell, whale ivory or wood. Hawaiians favored net fishing over other methods as the nets allowed fishermen to catch many fish at once and they could be used from shore or from a canoe. (www.hawaiihistory.org) Beyond the reef, the benthic zone was less important although it is the habitat of some important food fish such as snapper (Lutjanidae). The open sea or pelagic zone is the home to the larger carnivorous fishes, *mahimahi* (Coryphaenidae), *ahi* and *aku* (Scombridae), and marlin (Istiophoridae) prized by the Hawaiians who used canoes to troll for them. (Kirch 1985)

Figure 17: Map of Ahupuaʻa of the Waialua District



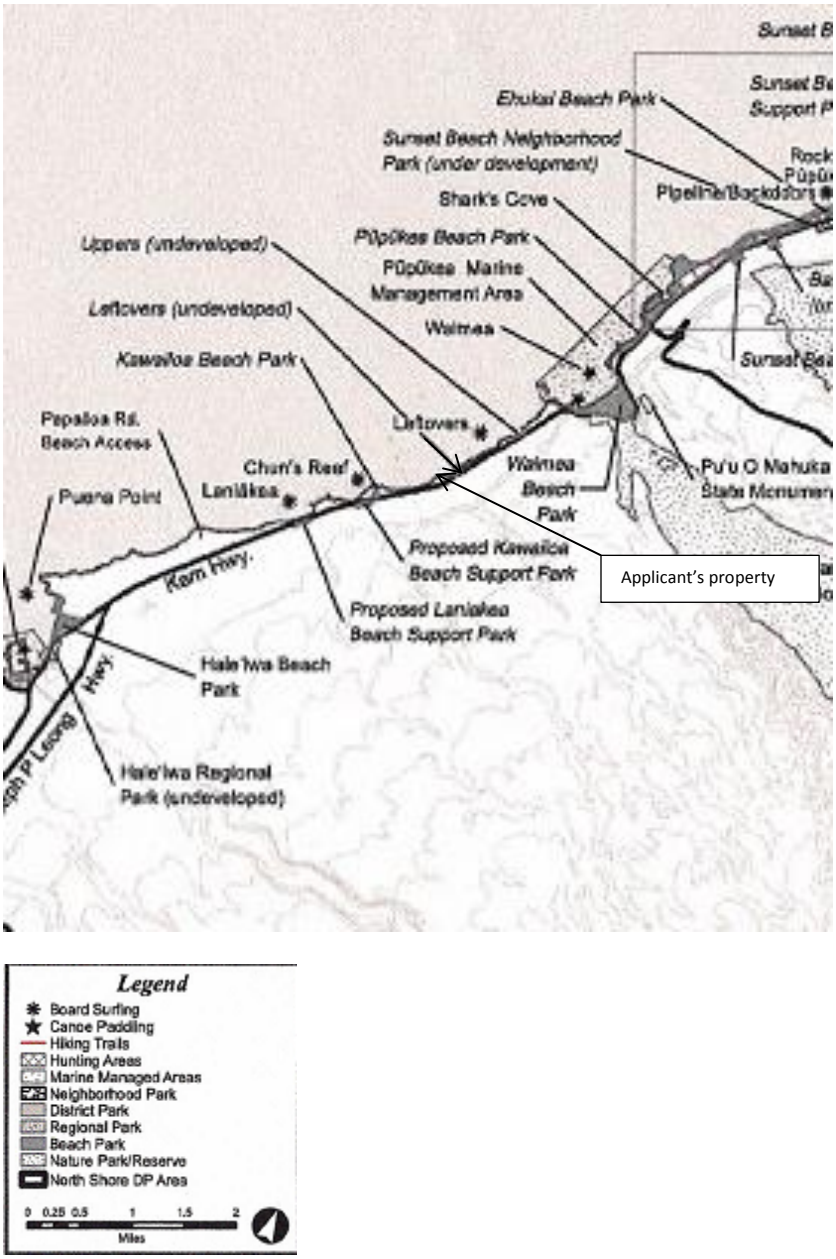
Source: http://apdl.kcc.hawaii.edu/oahu/stories/waialua/index.htm

3.12.2 Public Shoreline Recreation:

Under the public trust doctrine and in accordance with legal case of King vs. Oahu Railway & Land Co., 1899, the Hawaii Supreme Court held that "lands under navigable waters in and around the territory of the Hawaiian Government are impressed with a trust for the public uses of commerce, navigation and fishing".

Public beach access is 450 feet to the north of the applicant's property at "Leftovers" beach access. This is marked with a red arrow on Figure 18. This is undeveloped beach access with parking and a path through the vegetation to the beach. Public access to the south is at "Chun's Reef" or Kawailoa Beach Park ½ mile south of the applicant's property. (Figure 18) Lateral beach access is not impeded in any way. The ½ mile stretch of beach is always accessible unless high surf conditions make it unsafe. Beach activities include net fishing, pole and line fishing, spear fishing, surfing, snorkeling and swimming. There are no bathrooms, picnic tables, showers or other amenities at the Leftovers beach access.

Figure 18: Public Beach Access on the North Shore of Oahu



Source: North Shore Sustainable Communities Plan 2011

4.0 Description of Impacts and Mitigation Measures:

4.1 Impacts to Climate:

Legalizing the retaining wall, CRM stairs and landing will in no way impact the climate. However, removing the retaining wall could severely impact the applicant's house and deck.

Mitigation: Granting the shoreline setback, variance and after the fact building permits. There is no impact on climate, thus no mitigation measures are needed.

4.2 Impacts/Mitigation to Geology:

Legalizing the retaining wall, CRM stairs and landing will have a positive impact on topography, geology and soils. No mitigation is needed for the project as proposed. However, if the retaining wall was removed, there could be significant impacts to topography and soil. Removal of the retaining wall would allow large waves, storm surf and extreme wave events to erode the soil. Debris sediment would be washed into the class A Marine Waters increasing turbidity. Mitigation of this erosion would be to keep the retaining wall.

4.3 Impacts/Mitigation to Marine/Beach Environment:

The retaining wall, CRM stairs and landing have been present on the property for around 15 years. There has been no significant impact to the beach or marine environment. Legalizing these structures would not significantly impact the marine or beach environment. No green turtle nesting habitats are present on the beach. Monk seals are still able to haul out without disturbance. The only time the waters impact the retaining wall, landing and stairs are with high surf events greater than 30-40 feet or extreme storm surge or tsunamis. During those events, the retaining wall is essential in the protection of the legal deck and house to prevent erosion and undermining of the foundations that would result in destruction of these legal structures.

Removal of the retaining wall would lead to erosion and the resultant debris and soil being washed into the ocean. This would increase turbidity of the Class A waters and could potentially damage the existing benthos and nekton present in the near shore environment creating a significant impact.

Mitigation: Legalizing the retaining wall, CRM stairs and landing would not have a significant impact on the near shore or beach environment; however, removing the wall could create a dangerous environment as well as negative impacts to the near shore and beach environment. Thus, the best solution/mitigation is to legalize the existing retaining wall, CRM stairs and landing and allow them to remain in place.

4.4 Impacts/Mitigation to Flora and Fauna:

There are no significant impacts to the terrestrial flora and fauna from the legalization of the retaining wall, CRM stairs and landing. Removal of these structures would create an environment of erosion. The lack of flank protection provided by the retaining wall would lead to erosion not only of the applicant's property but also the neighboring property and his structures. Erosion of the applicant's property would cause loss of soil, dirt and plants in high surf events. Eventual undermining of the foundation of the deck and house structure would be inevitable leading to the loss of property and structures thus, creating a hardship for the applicant. Removal of the retaining wall would encourage growth of beach strand and naupaka; however, no threatened or endangered species commonly utilize the area and replacement of the beach strand would not create a significant new habitat.

Mitigation: Allowing the retaining wall, CRM stairs and landing to remain in place results in no loss of property, decreased erosion of both the applicant and neighbor properties, and allows the owner reasonable use of his property.

4.5 Noise and Visual Impacts:

No noise or visual impacts are present with the current retaining wall, CRM stairs and landing. No visual view planes are blocked. Removal of the retaining wall, stairs and landing would create a temporary increase in noise in the local environment.

Mitigation: No noise mitigation needed for legalization of the retaining wall, CRM stairs and landing.

4.6 Air Quality Impacts:

The current retaining wall, CRM stairs and landing have no significant impact to the air quality of the local environment. Removal of these structures would create dust and debris that would temporarily affect the local air quality.

Mitigation: No air quality mitigation is needed for the legalization of the retaining wall, CRM stairs and landing.

4.7 Socioeconomic Impacts:

No significant socioeconomic impacts occur if the retaining wall, CRM stairs and landing are allowed to remain in place. Significant financial and economic impacts to the applicant would occur if he were forced to remove the retaining wall, stairs and landing. The retaining wall protects the legal structures on the property. Removal of the retaining wall would lead to significant erosion, undermining of the structures' foundations and ultimately the destruction of the legal structures. This would create significant financial and economic hardship for the applicant.

Mitigation: No socioeconomic mitigation is needed if the retaining wall, stairs and landing are legalized and after-the-fact building permits are issued.

4.8 Cultural/Recreational Impacts:

The retaining wall, CRM stairs and landing have not impacted or prevented any public use of the beach or cultural practices. Lateral access along the beach is not impeded. The structures are *mauka* of the shoreline and not on submerged lands. Legalizing these structures will not have any impact on the public use of the beach and near shore waters for recreation or cultural practices. No construction will be done so there will be adverse effect on any unidentified historically significant resources including human remains.

No cultural or recreational mitigation is needed.

4.9 Land Use:

The property is zoned R5 residential according to LUO of the City and County of Honolulu. The property is 14,590 square feet. The retaining wall ranges from 61 inches to 63 inches from the landing measured in accordance with DPP recommendations. The height of the retaining wall is less than 72 inches as mandated by Chapter 21-4.40 Land Use Ordinance of City and County of Honolulu. The safety railing on the deck is also less than 72 inches as mandated by section 21-4.40. No changes in land use will occur as a result of legalizing the retaining wall.

No mitigation for land use is required.

4.10 Cumulative Impacts:

A cumulative impact is one which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The proposed action is to obtain an after-the-fact shoreline setback variance and permits to legalize an existing moss rock retaining wall, CRM stairs and landing on the applicant's property that has been present for approximately 15 years. These structures were not constructed by the applicant and are located on private property; they have not caused any negative impacts to the environment, and are not part of a larger or continuing action.

The moss rock retaining wall is a protective structure to prevent erosion and undermining of existing legal structures of a deck and house by high surf events, extreme waves/tsunamis and storm surge. There has been no minor or significant impact to the beach or near shore environment in the 15 years the structures have been present, so no cumulative impacts are anticipated. Long term erosion rates of the beach are stable. High surf events, tsunamis and storm surge, however will continually be present year after year. The protection provided by the retaining wall is essential to prevent the erosion and undermining of the foundation of the legal non-conforming structures that could lead to the destruction of those legal structures. This would cause significant financial hardship to the applicant.

The CRM stairs and landing provide safe access to the beach. Removal of these structures would deprive the applicant from reasonable safe use of his property. These structures have not resulted in significant, negative impacts to the environment in the last 15 years.

Thus, no cumulative impacts to the environment are associated with the proposed action.

5.0 Alternatives to the Proposed Action:

5.1 No Action Alternative:

The no action alternative is not an option. The applicant would continue to be in violation of the shoreline setback with the retaining wall, stairs and landing. Fines would accrue for the permit violation and this would result in an unreasonable financial burden for the applicant.

5.2 Removal of the Retaining Wall, Stairs and Landing:

This alternative is not a practical or viable option. Removing the retaining wall would expose the applicant's deck and house to erosion from high surf events, storm surge and other extreme conditions. In addition, soil from under the deck and house would contribute to turbidity, decreased visibility and potential debris into the class A Marine Waters. Over time the erosion and undermining of the foundation of the deck and house would create a dangerous environment for the applicant and his family. Without the retaining wall, erosion would potentially undermine the neighboring property, thus creating an unsafe environment for the neighbor as well.

Removal of the stairs and landing are also not a practical alternative. This would deny the applicant who is visually impaired from safe access to the beach and deprive him of reasonable use of the property.

5.3 Build a Rock Revetment:

Rock revetments are sloped rubble structures of carefully placed un-cemented rock. Although rock revetments may absorb and dissipate more wave energy than vertical walls, in this case, the space between the revetment and deck structure would increase the risk of damage to the deck and would not provide enough flank protection. This could increase the risk of damage to the neighboring property.

5.4 Build an Open Lattice Fence:

Another alternative would be instead of the moss rock retaining wall, building an open, lattice work fence of wood, vinyl or chain link. This would not be an effective alternative as the open work fence would not (1) be strong enough to withstand the force of the waves or (2) retain the soil or protect the structures on the property. During high surf events, storm surge and extreme wave events, this type of fence would allow soil and debris to wash away contaminating the waters and would not prevent erosion of the foundation of the house and deck. It would potentially create an environment where damaging erosion could occur to such an extent that the house/deck could fall off the foundation and into the waters creating extreme hardship to the applicant.

5.5 Sand Bags

Sand bags are a temporary solution that may provide some protection if the retaining wall is removed. However, they are a less than adequate permanent solution as sand bags are subject to undermining and displacement by high surf events, storm surge and extreme wave events. In addition, they are subject to vandalism and continual maintenance. Over time erosion would still occur undermining the foundation of the house and deck leading to a high risk of the structure coming off its foundation and being displaced. This would cause significant hardship to the applicant and deprive him from reasonable use of his property and legal structures.

5.6 Obtain an After-the-fact Shoreline Setback Variance and Permits for the Retaining Wall, Stairs and Landing:

The preferred alternative is to apply for an after-the-fact shoreline setback variance and building permits to correct the current violation. The retaining wall, CRM stairs and landing have been in place since approximately 1996 prior to the applicant's purchase of the property. There have been no significant problems or issues with the stairs. The moss rock retaining wall has prevented erosion of the deck and foundation of the house for the last 16 years during high surf events, storm surge and tsunamis. There has never been any damage to any of the structures from these surf and wave events. The retaining wall prevents sandy, silty soil and debris from washing off the property onto the beach and into the Marine waters. All of the structures are landward of the shoreline on private property. They are not in the wash zone, nor do they impede sand movement or cause any environmental damage to the beach. They do not prevent any public access of the beach or impede any beach or cultural activities or impact any view planes.

6.0 Consistency with Public Policies and Objectives:

6.1 Oahu General Plan:

The Oahu General Plan directs growth to the primary urban centers of Central Oahu and the Ewa regions. Oahu's north shore is designated rural where growth and development will be managed to preserve the country-like atmosphere with its agricultural lands and "undesirable spreading of development is prevented" and "population densities are consistent with the character of development and environmental qualities desired for the area". (General Plan of the City and County of Honolulu) Granting a shoreline setback variance and after-the-fact building permits for the existing retaining wall, stairs and landing on the applicant's property in no way conflicts with this plan or ideal. These structures have been in existence for approximately 15 years. They were not constructed by the applicant. There is no increase in population density, no change in zoning, is consistent with the R5 residential designation of the property and there is no negative impact to the local environment.

6.2 North Shore Sustainable Communities Plan:

The North Shore of Oahu is considered the "country" particularly when compared to metropolitan Honolulu. The goal of the North Shore community is to maintain this rural character with its agricultural lands, open space, natural environment, recreational resources and scenic beauty of Oahu's northern coast. (NSSCP 20110) Legalization and permitting of the retaining wall stairs and landing do not conflict with this plan. These structures do not impact the local beach and marine environment and do not limit public access to the beach, recreational activities or cultural practices. These structures have been present for at least 15 years without any significant impact. Removal of the retaining wall, stairs, and landing would lead deprive the applicant from reasonable use of his property and could create a

dangerous situation for the public by the destruction and debris that would arise from erosion from high surf events. Removal of these structures would increase erosion of the applicant's property, increase run-off that could potentially damage the reefs and near shore marine environment, undermine the foundations of legal structures, and as a result, would be in conflict with the North Shore Sustainable Communities Plan of 2011.

6.3 State Coastal Erosion Management Plan (COEMAP)/Coastal Zone Management:

One of Hawaii's most valuable, natural resources is its beaches. The applicant and preparers of this document have taken this into consideration in his evaluation of the impact of the retaining wall, stairs, and landing on the beach at this property. It is a fine balance between protecting one's property and yet minimizing the impact on beach processes. Many alternatives have been discussed such as rock revetment, removal and/or sand bags as well as others, in the environmental assessment. For this property, given the lack of impact the retaining wall, stairs and landing have on the natural processes along the shoreline, approval of 'as is' construction is appropriate. As stated in COEMAP, "to simply let our coastal investments and human efforts wash into the sea would not be a rational management decision". The retaining wall, landing and stairway in no way inhibit the public from any kind of access or utilization of the beach, ocean and shoreline. View planes are not impacted. Use of the reef for throw-net fishing, the ocean for surfing and other recreation are not impacted by these structures.

According to Hawaii Revised Statutes §205A-2, Coastal Zone Management Policies and Objectives under section (9)(B), *Prohibit the construction of private erosion-protection structures seaward of the shoreline except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities;* The applicant's retaining wall, stairs and landing are *mauka* of the shoreline and are consistent with these policies. (Figure 2) They are not located in the swash zone nor do they impede the natural beach processes unless extreme high surf events are present. During these extreme wave events, often times the beaches on the North Shore are closed to the public for safety reasons. These structures do not limit the public's use of the beach for traditional or recreational activities in any way. However, the structures do protect the applicant's house from damage and erosion from extreme high surf events.

Scientific data have been used in making these assessments through evaluation of information from aerial photography, coastal engineering, textbooks, OEQC, North Shore Communities plan and COEMAP. The public has been consulted in this process by: the applicant discussing options with his neighbors. In the development of this document, the applicant has met with Art Challacomb and Steve H. Cheung as well as other members of DPP, Jiro Sumada, Jamie Peirson, John "Mike" Friedel, and Lester Hirano to aid in the resolution of this matter.

7.0 Justification for the Shoreline Setback Variance

Criteria for granting a shoreline setback variance are defined in Section 23-1.8 Revised Ordinances of Honolulu (ROH). The applicant is requesting a shoreline setback variance for an existing moss rock retaining wall, CRM stairs and landing based on the Hardship Standard set forth in ROH Section 23-1.8 (b)(3). Under the Hardship Standard (A) *a variance may be granted for an activity or structure that is necessary or ancillary to the following private facilities or improvements, if hardship will result to the applicant if the facilities or improvements are not allowed within the shoreline area:*

For the applicant's property ROH Section 23-1.8 (b)(3)(A)ii apply: *Private facilities or improvements that may artificially fix the shoreline, but only if hardship is likely to be caused by shoreline erosion and conditions are imposed prohibiting any such structure seaward of the existing shoreline unless it is clearly in the public interest.*

The moss rock retaining wall, CRM stairs and landing are "mauka" or landward of the shoreline as surveyed in 2013 located on private property. The structures have been present on the property approximately 15 years and were not constructed by the applicant, but by the property's previous owner. The following 3 hardship criteria set forth in ROH Section 23-1.8(b)(3)(B).

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

The applicant's property is located on the beach on the North Shore of Oahu which is known for its large surf. Caldwell, 2008 reported that surf of 9 meters or 29.5 feet in height occur on average ten times a year since 1981. Significant episodes or waves 12 meters or 39 feet in height occur on average once annually and extreme surf or waves 15-18 meters or 50-60 feet in height occur on average once every seven years. The applicant has a legal non-conforming house and deck that date back to 1924. The house is located 13 feet from the moss rock retaining wall and landing on one side and 15 feet on the other side. The moss rock retaining wall and landing support the deck and retains 3-4 feet of dirt behind it. The house and deck structures would be extremely vulnerable without the retaining wall during high surf events, storm surge and extreme wave events (surf >40-50 feet and tsunamis). In the last 8 years the applicant has owned the property, there have been 3 tsunamis and multiple high surf events >40-50 feet. Without the retaining wall, these high surf and extreme wave events would cause erosion and undermining of the applicant's house and deck. Over time and multiple events, the deck could be destroyed, the house could be severely damaged and the owner would lose a significant part of his property. Without the flank protection the retaining wall provides, the neighboring property to the south would be at risk to suffer erosion and damage also. The erosion, run off and debris created by this scenario would create a hazardous condition on the beach in front of the applicant's house, could damage the near shore marine environment and could create a situation that would be dangerous to the public using the beach. The applicant would be denied use of his house and deck, both legal structures, thus depriving him of the reasonable use of his house and property. The CRM stairs and landing provide safe access to the beach. The applicant is visually impaired and it is reasonable for him to have safe access to the beach from his property. Stairs have been present on the property since at least 1986, just not in this form. These stairs have been present approximately 15 years without incident or problem. They were not constructed by the applicant and if they were removed, the applicant would have to navigate a steep, irregular rocky hill to reach the beach which could be potentially dangerous for the applicant and his family. Not having safe access to the beach would deprive the applicant from reasonable use of his property.

The shoreline setback provisions to not require a landowner to abandon his property in the shoreline setback area; rather, use of the property is permitted within the constraints imposed by

the statutes. There is no degradation of the environment by the present structures, thus no environmental gain by requiring the wall or stairs or landing to be demolished. This is why the owner is requesting a shoreline setback variance and permits for these structures.

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

Kawailoa Beach has a unique setting. The beach in front of the applicant's property is protected by a limestone bench reef. The moss rock retaining wall only is impacted by waves > 30 feet. It is landward of the shoreline survey from 2013. The neighboring properties to the north and south have either rock revetments or vertical rock walls protecting their properties from erosion and high surf events. Properties on this beach without any protection suffer from erosion each year and have had damage to existing decks and structures. Approval of the shoreline setback variance would be consistent with prior actions. Approval would be due to unique site-specific erosion issues and unique legal non-conforming structures present on the applicant's property and does not call into question the reasonableness of this chapter or the shoreline setback rules.

The applicant's property has had stairs on it since at least 1986 (documented by DPP) just not in this form. Several of the adjacent properties have CRM stairs or wooden stairs down to the beach. The applicant is visually impaired and having safe and stable access to the beach is essential for his ability to use the beach and his property. This is also a unique situation that does not call into question the reasonableness of the setback rules.

The purpose of the moss rock retaining wall, stairs and landing is to protect the applicant's house and deck from significant erosion high surf events and to allow safe access to the beach. High surf events that regularly occur on the north shore would cause significant erosion and damage to the applicant's property and legal structures. The shoreline setback provisions do not require a land owner to abandon their property or legal structures in the setback area. Use of the property is permitted within the constraints imposed by the statutes and this is what is occurring on this property.

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

Under the alternative action section of this EA five alternatives are reviewed. Under the no action alternative, the applicant would continue to have a notice of violation on his property and fines would accrue causing financial hardship. This is not a viable alternative.

The second alternative is to remove the moss rock retaining wall, CRM stairs and landing. This would result in erosion from high surf events, storm surge and extreme wave events that would lead to the undermining of the foundation of the house and deck. Soils and debris would be washed off the property into the class A marine waters causing turbidity, damage to the reef and near shore

nekton. Turtle feeding grounds on the reef would be damaged. Ultimately such damage could occur to cause the deck to be washed out to sea and severe damage to the house. This would result in a dangerous environment on the beach for the public and neighboring properties. The degradation to the environment and the severe damage to the applicant's property make this alternative unacceptable.

The third alternative action is to build a rock revetment under the deck. Under some circumstances rock revetments can absorb and dissipate more wave energy than vertical walls, in this case, the space between the revetment and deck structure would increase the risk of damage to the deck and would not provide enough flank protection. This could increase the risk of damage to the neighboring property as well as the applicant's deck and house making this not an acceptable alternative.

The fourth alternative is an open lattice fence constructed out of wood, vinyl or chain link. This alternative is not practical as it does not protect the structures from erosion. Soil and small debris can pass through the openings and degrade the conditions of the beach and near shore waters. It is unlikely that this alternative is strong enough to withstand the force of high surf events and extreme wave events making it not an acceptable alternative.

The fifth alternative is the use of sand bags. Sand bags are a temporary solution that may provide some protection if the retaining wall is removed. However, they are a less than adequate permanent solution as sand bags are subject to undermining and displacement by high surf events, storm surge and extreme wave events. In addition, they are subject to vandalism and continual maintenance. Over time erosion would still occur undermining the foundation of the house and deck leading to a high risk of the structure coming off its foundation and being displaced. This would cause significant hardship to the applicant and deprive him from reasonable use of his property and legal structures.

The last and preferred alternative is to correct the current notice of violation by granting the applicant after-the-fact building permits for the existing moss rock retaining wall, CRM stairs and landing that have existed on the property for approximately 15 years. The existing retaining wall has withstood high surf events, extreme waves and tsunamis. There has been no degradation of the environment. The moss rock retaining wall is the best alternative for protecting against environmental damage and loss of property. The owner is applying for an after-the-fact shoreline setback variance and permitting to correct the current violation. This is the best and most practical alternative.

The preferred alternative is the best practicable alternative to reduce the hazards and problems due to high surf events, storm surge and extreme wave events. The moss rock retaining wall has a minimal footprint and elevation, is "mauka" of the shoreline and does not affect coastal access or public use of the beach. This is also the alternative that would have the least impact on the marine environment.

Section 23-1.9 sets forth that no variance shall be granted unless appropriate conditions are imposed:

(a) *To maintain safe access to and along the shoreline or adequately compensate for is loss;*
(b) *To minimize risk of adverse impacts on beach processes*
(c) *To minimize risk of existing legal or proposed structures falling and becoming loose rocks or rubble on public property; and*
(d) *To minimize adverse impacts on public views to, from and along the shoreline.*

The preferred and best practicable alternative of legalizing the moss rock retaining wall, CRM stairs and landing meet the above conditions. There is no adverse impact on the environment or public views by the existing structures. Without the retaining wall, stairs and landing safe access to the shoreline would be denied to the applicant, erosion would take place and there would be a high risk that the legal deck and house structures could become loose rubble and debris impacting the beach environment. Thus, granting the after-the-fact shoreline setback variance and leaving the retaining wall, stairs and landing in place is the best practicable alternative that meets the criteria set forth in the Revised Ordinances of Honolulu Chapter 23.

8.0 Determination of Significance:
The findings and determinations of this EA are based on the significance criteria contained in Chapter 343, HRS as amended, and Title 11, Chapter 200, HAR. In determining whether an action may have a significant effect on the environment, the proponent must consider every phase of the proposed action, the expected consequences, primary, secondary and cumulative.
An action shall be determined to have a significant effect on the environment if it:

1. "*Involves an irrevocable commitment to loss or destruction of any natural or cultural resource*"
-The applicant's property is not in a historic district, nor does it have any known cultural resources on the property. The retaining wall will serve to protect the existing legal non-conforming house and deck from significant damage and erosion, and also as it is constructed, protects neighboring properties from damage as well. There is no endangered flora or fauna that is impacted by the stairs, landing and seawall. Endangered marine animals such as the Hawaiian Monk seal and green sea turtle's habitats are not impacted by the presence of the seawall, stairs and landing.

2. *"Curtails the range of beneficial uses of the environment"*
There is no impact on public access to the shoreline and ocean. The closest public access, Leftovers, is 450 feet to the north of the property. There is no impact on lateral access to the shoreline and no impact to fishing on the reef flat seaward of the retaining wall, stairs and landing. Beneficial residential use of the environment would be threatened without the existing retaining wall, stairs and landing.

3. *"Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS"*
The seawall, stairs and landing are all landward of the certified shoreline as of October 2000. Therefore, they are not in the State Conservation District along the shore. The retaining wall, stairs and landing are also landward of the mean high tide line and separated by near shore water by a sandy stretch of beach. There is no soil run-off that could impact the near shore waters with the stairs, landing and retaining wall in place. If they were to be removed, then there would be a significant risk of soil erosion contaminating near shore water with high surf events, storm surge and extreme wave events.

4. *"Substantially affects the economic or social welfare of the community or state"*

There is not economic or social impact to the state by the existing stairs, landing and retaining wall. There would be a significant, detrimental effect to the property if these structures were removed. This would deprive the owner from accessing safely the beach and would significantly increase the risk of damage to his house, deck and neighboring properties creating hardship on the applicant.

5. *"Substantially affects public health"*

There is no public health affect by the existing structures.

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

There is no impact of the existing structures on the population, public services or facilities.

7. *"Involves a substantial degradation of environmental quality"* –

The existing structures do not degrade the environment. They are "mauka" of the shoreline. There is no significant adverse impact on marine flora and fauna. The retaining wall is impacted only when there is high energy surf in excess of 30 feet. These occurrences are rare, happening once or twice a year. Removal of the retaining wall would increase the risk of soil erosion, resulting in temporary siltation, and contaminating the near shore marine environment. Removal of the retaining wall and landing would increase the risk of damage to neighboring properties as well as the existing structures on the applicant's property, and potentially creating a hazardous condition for the public. Visually, the stairs, landing and seawall are consistent with the existing walls and revetments along the beach.

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

The proposed action is not a component of other actions, and the existing structures have no cumulative impacts or commitment for larger actions.

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

The existing structures do not affect endangered species or habitat. Both the green sea turtle and Hawaiian Monk seal are found in the waters and reef in front of the property. The stairs, landing and retaining wall in no way affect their habitat or the ability for them to access the shoreline. The property is not in a designated critical habitat, marine sanctuary or wetlands.

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

Since no construction needs to be done, there will be no detrimental effects on the quality of air or water or ambient noise levels. Removal of the stairs, landing or retaining wall would substantially increase the risks of regular sedimentation, water quality impacts and environmental quality impacts on the near-shore area.

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

    The property is in FEMA flood zone VE with base flood elevation of 18 feet. The stairs, landing and retaining wall are within this plain, although the two houses on the property are above the flood elevations at 19 and 23 feet respectively. The stairs, landing and retaining wall are subject to wave conditions by high energy storm surf in the winter season from North Pacific storms. The retaining wall, stairs and landing have been examined and determined to be stable under possible severe wave conditions by a certified, licensed structural and civil engineer, Joeffrey

Cudiamat. (Appendix A for engineering report)

12. *"Substantially affects scenic vistas and view planes identified in county or state plans or studies"* The applicant's property is one of eight homes along a private road. The beach cannot be seen from the highway in this area. The retaining wall, stairs and landing do not affect any view planes laterally and the structures do not extend above ground level on the property which is 15 feet. There is no impact on the public access north or south of the property and the structures will not be seen from those locations.

13. *"Requires substantial energy consumption"* –
The structures have been in place approximately 15 years, so no significant energy will be expended or consumed, nor is there any long-term commitment to energy use.

Based on the analysis of the 13 significance criteria listed above, the proposed action is not expected to result in significant adverse environmental impacts. There are no environmental impacts related to the applicant obtaining a shoreline setback variance and after-the-fact building permits. A Finding of No Significant Impact is anticipated.

9.0 Conclusions:

Structures within the shoreline setback can potentially affect physical, biological and ecological characteristics of a shoreline as well as property values and community considerations. The impact can be both beneficial and adverse depending on a variety of factors, such as placement location, structure type, seasonal changes in wave and beach form and the density of the structure. (O'Connell) The applicant's legal non-conforming structure originally built in 1924 predates the regulations governing shoreline setbacks. The applicant's retaining wall is located well back from the surf zone unless there is an extreme high surf event. It does not limit the public's use or enjoyment of the beach or significantly affect the beach processes. Nor do the structures significantly impact any biological or near shore marine processes or environment. Without the protection of the retaining wall, the legal non-conforming structures would be subject to direct erosion from high surf events, flank erosion from the proximity to the neighboring vertical CRM wall and scouring. This would result in damage to the foundation and potential loss of the house structure and deck which would deprive the applicant the use of his house and property and would cause significant hardship. In addition debris and sediment loss could damage the near shore environment and be a danger to the public. The applicant qualifies under the ROH §23-1.8 3 (b) definition of hardship. Thus, a Finding of No Significant Impact (FONSI) is anticipated for this environmental assessment and the best proposed solution to the notice of violation is after-the-fact shoreline setback variance and building permits.

10.0 Public Agency Involvement, Review and Consultation

City and County of Honolulu

Department of Planning and Permitting- Jiro Sumada, James Peirson, John "Mike" Friedel, Art Challacomb, Steve Chung, and Lester Hirano- meeting 11-1-13.

Office of Conservation and Coastal Lands – phone conversation Sam Lemmo (November 28, 2012)

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Engineering and Appendix A were prepared by: Joeffrey Cudiamat, S.E., P.E.

Dave Robichaux Environmental Consultant

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COASTAL ENGINEERING EVALUATION FOR
SHORELINE SETBACK VARIANCE APPLICATION

TMK:6-1-012:021
61-357 Kamehameha Highway
Haleiwa, Oahu, Hawaii

May 2007
(updated 2013)

Prepared by:

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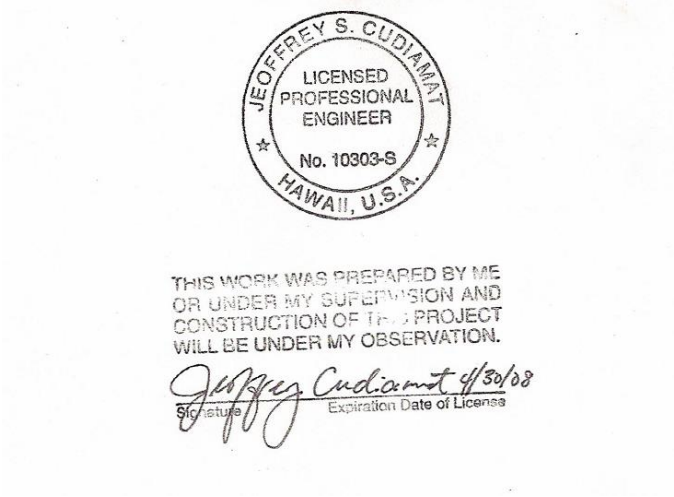

APPENDIX A: COASTAL ENGINEERING

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I. REFEENCES

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b. *Oahu Coastal Zone Atlas*, prepared for the U.S. Army Corps of Engineers, Pacific Ocean Division, Fort Shafter, Hawaii, AECOS, Inc., 1981.

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II. LOCATION AND GENERAL DESCRIPTION

This report has been prepared to accompany a Shoreline Setback Variance application to the City and County of Honolulu, Department of Planning and Permitting for 'as is' approval of CRM stairs, landing and moss rock retaining wall on a property located at 61-357 Kamehameha Hwy. The property is located on the makai (ocean) side of the highway and is part of Kawailoa Beach lots. It is located down a small private road off the highway in a development of single family homes. The property is located approximately 450 feet south of the public beach access of Leftovers. (Figure 1)

The property was purchased by the applicant in June, 2004. At that time, the CRM stairs, landing and moss rock retaining wall were in place. It was not disclosed to the applicant that these structures were non-permitted. On June 23, 2006, applicant received a notice of violation of CRM seawall, CRM stairway and landing. The shoreline certification map, dated October 24,

2000 shows the structures, walls and pipes located on the property.(Figure 2) There are two small houses on the property. The structure on the south side of the property that from now on will be designated as 'guesthouse', and attached deck are legal nonconforming structures, as part of the guesthouse and all of the deck are located within the shoreline setback area. The retaining wall is located directly below the deck. Attached and adjacent to the retaining wall are the CRM stairway and landing. The foundation of the house is within 13 feet of the seawall on one side and 15 feet on the other. According to the shoreline survey done by James R. Thompson and Andrew Bohlander (DLNR), the moss rock retaining wall, CRM stairway and landing are *mauka* (landward) of the shoreline.

As stated previously, the property is part of Kawailoa Beach lots and is located 450 feet south of the public access, Leftovers and 1/2 mile north of Kawailoa Beach Park. The shoreline ranges 60-80 feet wide at the makai side of the property and is made up of calcareous sand and exposed beach rock, fronted by a shallow fringing reef. It has a natural history of erosion, particularly to the south of this property. The two properties to the north and the two properties to the south of this property all have shoreline protective devices either in the form of rock revetment or CRM seawall. (Figure 8).

There is a layer of Waialua silty clay under the sand. Under typical conditions, this layer of clay is covered with a layer of sand. Waialua silty clay is present on smooth coastal plains. The surface layer is dark reddish-brown silty clay about 12 inches thick and the sub layer is about 26 inches thick in a sub angular blocky structure. (USDA Soil Survey1972) (Figures 19, 20) Because of difficulties during construction to dredge through the clay, the retaining wall is anchored directly to the clay with dowels and mortar. The moss rock retaining wall is made up of blue rock weighing about 25 to 150 pounds (median weight of 80) and is 6’ high from the north end of the wall to the south end. Full height CRM buttresses spaced approximately 5’ on center behind the wall provide additional support from horizontal forces induced from high waves. Backfill behind the wall is approximately 3’ to 4’ above the foot of the wall. The 16”-wide moss rock wall supports the beach-side edge of the exterior, open deck located at the rear of the dwelling while the exterior deck is supported on posts and piers at interior bays. This moss rock wall protects the existing deck and house structure from tidal forces during periods of high wave action. Weep holes are present in the moss rock wall to allow any water collected behind the wall to be discharge to the beach. At the toe of the moss rock wall is a CRM landing (approximately 2-foot high and 3-feet wide) connected to a stair also constructed of rock, rebar and mortar. This built-up landing, coupled with an existing large lava rock bed in front of the wall, provides additional sliding resistance at the base of the moss rock wall. This continuous horizontal landing helps protect against possible damage to the wall due to scour and undercutting of the toe. Wave forces are dissipated when it hits raised rock landing. (Figure 18)

Because of the locations, legal nonconforming structures of guesthouse and deck, protection from erosion is essential to prevent undermining of the foundation of the guesthouse and damage to the deck creating a potentially dangerous situation. Also, safe access to the beach is essential as the applicant is visually handicapped. The applicant is striving to minimize any potential erosion or damage to the neighboring property to the south, and is keeping in consideration the impact of such structures on the environment, shoreline, beach and marine life. The applicant and preparers have taken under consideration information from the Oahu Shoreline Study Part 1 & 2, COEMAP and "North Shore Sustainable Communities Plan", Land Use Principle and Guidelines in making this report and will show how it meets the criteria for shoreline setback variance in Chapter 23, Revised Ordinances of Honolulu. Thus, the applicant is asking for 'as is' approval for CRM seawall, stairway and landing for shoreline setback variance.

III. GENERAL WAVE AND WATER LEVEL CONDITIONS

The coast is directly exposed to prevailing winds and large winter season north swell waves generated by north Pacific storms.

North swell, which is primarily from the northwest, can occur any time of the year, but is most common during the months of October through March. The shoreline is protected from large wave forces by a wide and shallow fringing reef fronting the shoreline. Large waves break offshore, and then reform and continue shoreward as smaller waves. Wave breaking and reforming may occur several times before the wave finally expends its remaining energy on the shore. Waves reaching the shore are limited by the near-shore water depth, and on a wide and shallow reef, wave heights are typically about 0.6 times the water depth. Winter high tides can be +1.5 to +2.0 feet above MSL, and wave setup along the shore during periods of high surf may add another 0.5 feet to the water level. Assuming a high tide of +2.0 feet, a 0.5-foot wave setup, and a water depth of -2.5 feet below MSL immediately seaward of the offshore beach, wave heights of about 3 feet can be expected to break on the offshore beach. Wave heights at the beach would be less than 3 feet; however, severe storm and hurricane conditions near the project site could result in higher water levels and larger waves.

General tide data taken from EM 1110-2-1100 for the site is as follows, based on a mean lower

low level (MLLW) datum:

Mean Higher High Water	1.90
Mean High Water	1.40
Mean Sea Level	0.8
Mean Tide Level	0.80
Mean Low Water	0.20
Mean Lower Low Water	0.00

Translating the data to values based on a mean sea level (MSL) datum:

Mean Higher High Water	1.10
Mean High Water	0.60
Mean Sea Level	0.0
Mean Tide Level	0.00
Mean Low Water	-0.60
Mean Lower Low Water	-0.80

IV. DESIGN WAVE HEIGHT AT TOE OF MOSS ROCK WALL (EM 1110-2-1614)

Site Parameters:

Bottom slope seaward of structure, *m*: 1V to 20H

Water depth at structure of toe: +7 MSL

(taken from survey by James Thompson, PLS, dated May 28, 2013)

Still water level rise above MSL:

Tide (MHHW): +1.10 MSL

Wave setup: +0.50 MSL

Total design water depth, d_s: -2.40 MSL; however, assume +1.0 MSL

Wave period, *T*, of shallow water

Reformed wave on the reef flat: 6 seconds (ASSUMED)

Wave height, *H*, (EM 1110-2-1614, Fig. 2-2):

$d_s/(gT^2) = 0.00086$

For m=1:20, H/ d_s=1.05; *Therefore, H = 1.05x1.0 =1.05'*

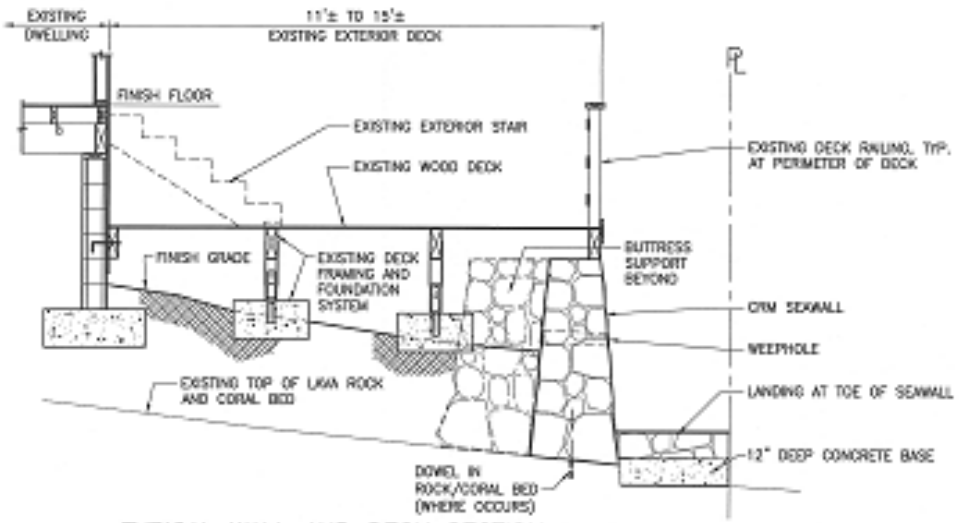
V. VERIFY MOSS ROCK WALL DESIGN (EM 1110-2-1614)

Required Individual Armor Unit Weight:

$W = \gamma_r H^3 / [K_D (\gamma_r/\gamma_w - 1)^3 \cot \theta]$ = 18 lbs.; however, use 25 lbs.

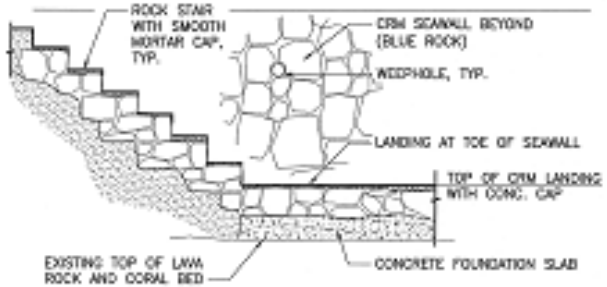
Note: Stones used are approximated at 25 lbs to 150 lbs. The toe of wall is protected from scour and undermining by a 1-foot high x 3-foot wide CRM apron landing.

Figure 19: Diagram of Moss rock retaining wall, CRM stairs and landing



TYPICAL WALL AND DECK SECTION

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



TYPICAL STAIR SECTION

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

0 4' 8' 12'

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

Structural Hawaii LLC

STRUCTURAL HAWAII, INC.

PROJECT NAME: SEYMOUR RESIDENCE

ADDRESS: 61-357 KAMEHAMEHA HWY HALEIWA, HI 96712

TAX MAP KEY: 6-1-012:021

TYPICAL WALL AND STAIR SECTIONS

Figure 20: Map of Soils from USDA Survey

Figure B-2.4. Soils in the Kawailoa Area
Source: Hawaii Statewide GIS Program

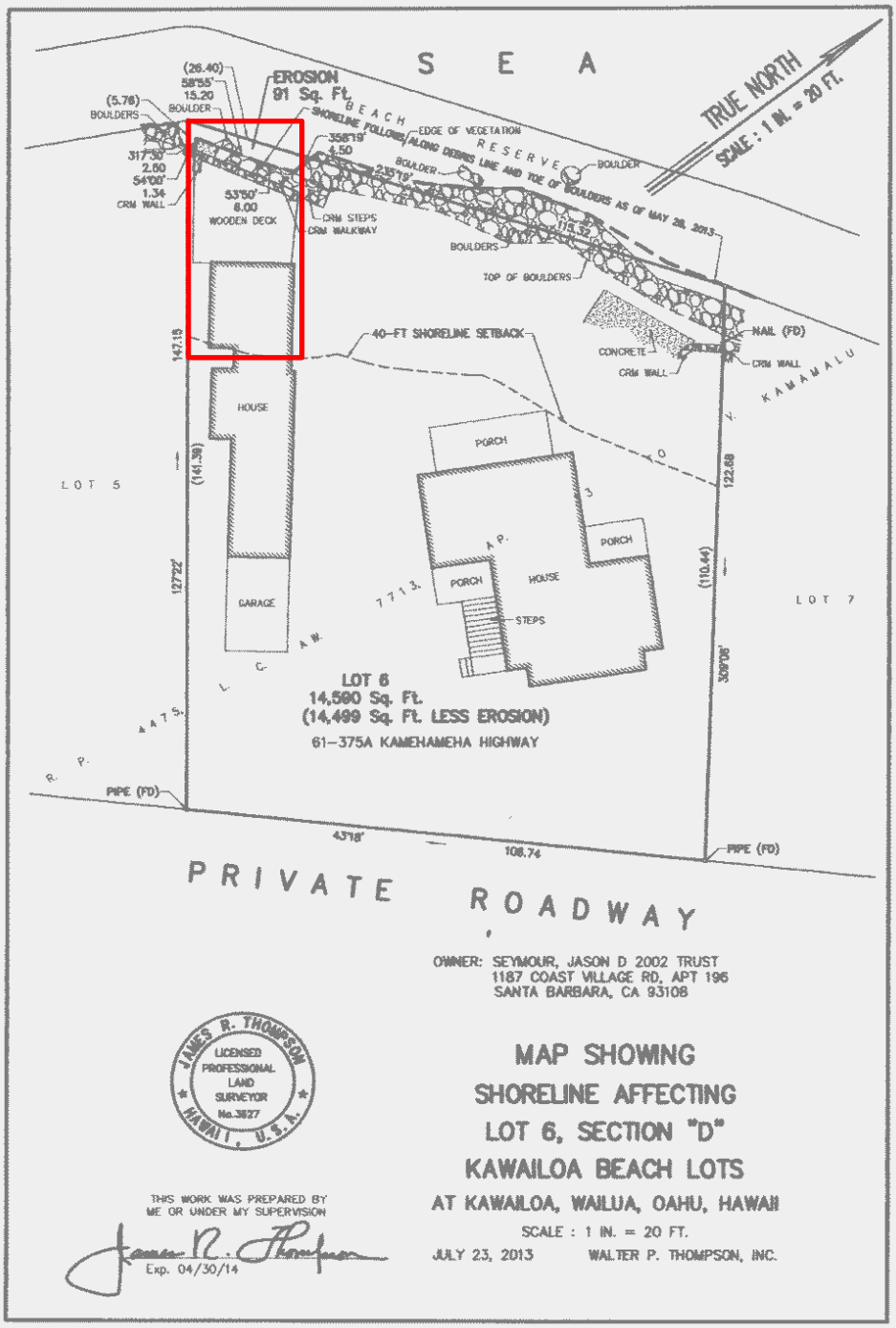
Figure 21: Close up of Map of Soils showing the applicant's property

APPENDIX B:

Shoreline Survey as of May 28, 2013

And

Architectural Site Plan Including 2013 Shoreline



OWNER: SEYMOUR, JASON D 2002 TRUST
1187 COAST VILLAGE RD, APT 196
SANTA BARBARA, CA 93108

JAMES R. THOMPSON
LICENSED PROFESSIONAL LAND SURVEYOR
No. 3827
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Exp. 04/30/14

MAP SHOWING SHORELINE AFFECTING LOT 6, SECTION "D" KAWAILOA BEACH LOTS

AT KAWAILOA, WAILUA, OAHU, HAWAII

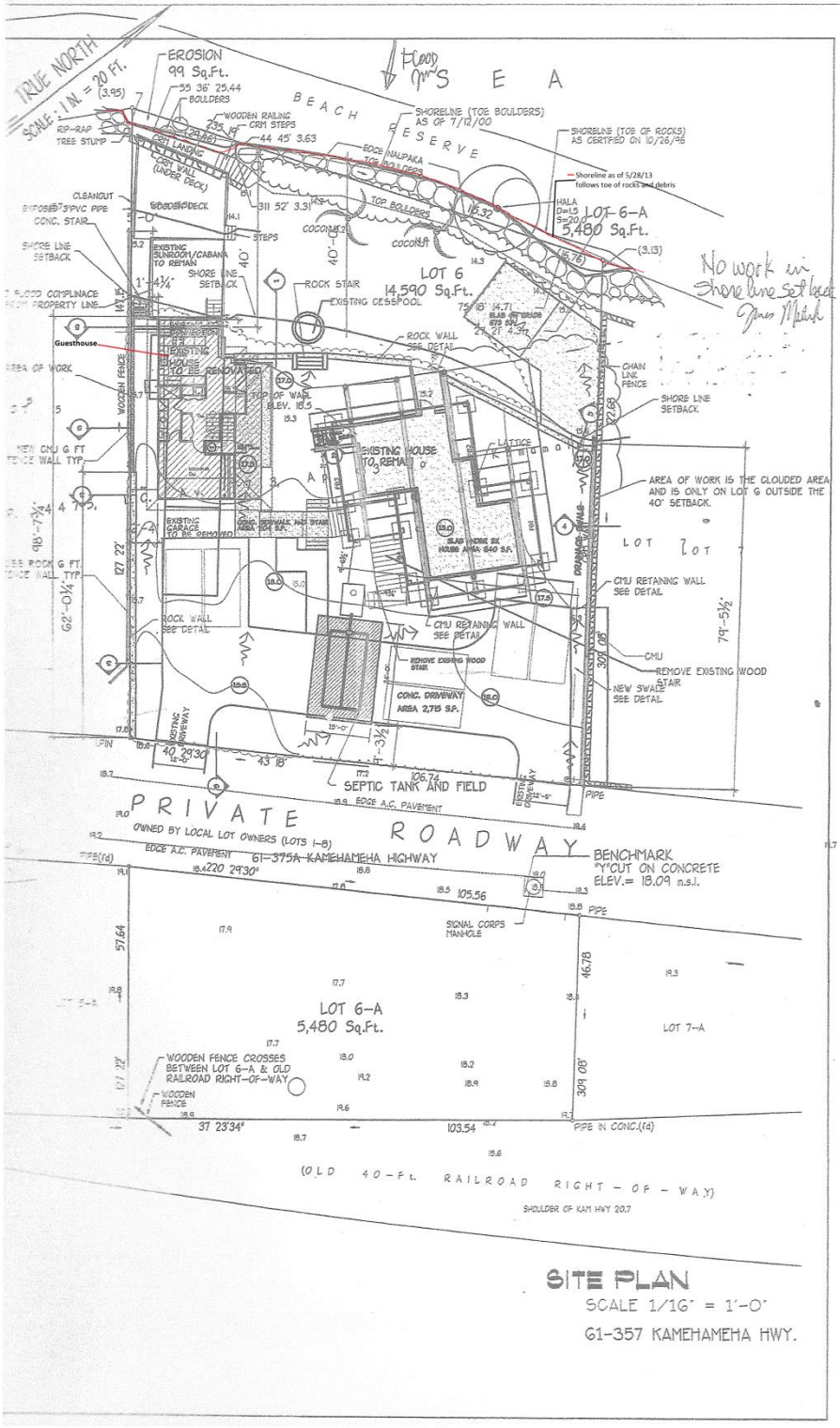
SCALE : 1 IN. = 20 FT.

JULY 23, 2013 WALTER P. THOMPSON, INC.

95166-01.dwg/1604.39/pjs/20130528

TAX MAP KEY : 6 - 1 - 12 : 21

10"x 15" = 1.04 Sq.Ft.



SITE PLAN

SCALE 1/16" = 1'-0"

61-357 KAMEHAMEHA HWY.

HAWAII ARCHITECTS INC.

James Matichuk, AIA

MAILING ADDRESS: 111A MEKILI ST., #165
OFFICE ADDRESS: 422 WANAAO ROAD
Kailua, Hawaii 96734
Fax.: (808) 263-8328

Phone: (808) 262-2475

NO.	REVISIONS	BY:

JAMES R MATICHUK LICENSED PROFESSIONAL ARCHITECT No. AR 6533 STATE OF HAWAII

DATE:

This work was prepared by me or under my supervision and construction of this project will be under my observation (Observation of constructions as defined in the rules and regulations of the Board of Professional Engineers, Architects, and Surveyors of the State of Hawaii.)

NOTE: Contractor to check and verify all dimensions at job before proceeding with work.

APPROVED DPP

CLIENT:
GEORGE SUMAN
61-357 KAMEHAMEHA HWY.
HALIEWA, HAWAII

DESCRIPTION:
SITE PLAN