DEPARTMENT OF LAND UTILIZATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432

'93 JUL 30

OFC. OF ENV.
QUALITY CO

FRANK F. FASI
MAYOR

DONALD A. CLEGG
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

93/SV-005(AC)

July 29, 1993

Mr. Brian J. J. Choy, Director
Office of Environmental Quality Control
220 S. King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

CHAPTER 343, HRS
Environmental Assessment/Determination
Negative Declaration

Recorded Owner	:	Alice L, Stanley Trust
Applicant	:	Alice L. Stanley Trust
Agent	:	Scott P. Sullivan
Location	:	67-417 & 67-419 Waialua Beach Road, Waialua, Oahu
Tax Map Key	:	6-7-13: 2 and 32
Request	:	Shoreline Setback Variance
Proposal	:	Construct a 1V:1.5H Rock Revetment
Determination	:	A Negative Declaration is Issued

Attached and incorporated by reference is the environmental assessment prepared by the applicant for the project. Based on the significance criteria outlined in Chapter 200, State Administrative Rules, we have determined that preparation of an Environmental Impact Statement is not required.

Very truly yours,

Donald Clegg

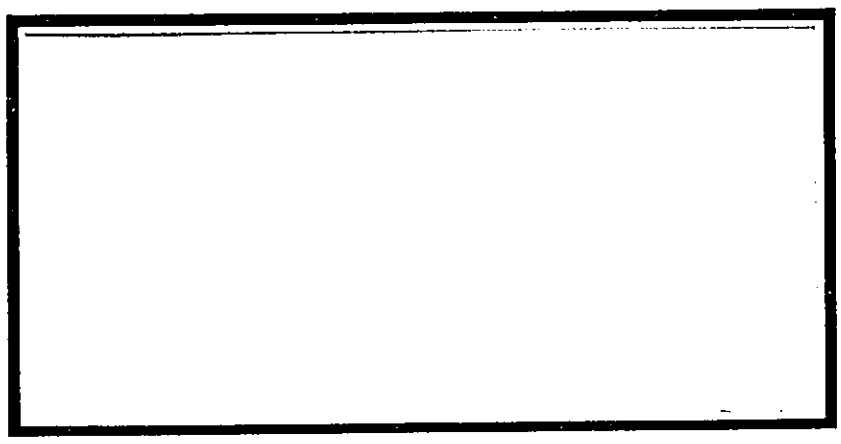
DONALD A. CLEGG
Director of Land Utilization

DAC:ak
Enclosures

G:oeqcsv5.ac

1993-08-23-OA-PBA- Stanley Thrust Rock Revetment

AUG 23 1993



Sea Engineering, Inc.

FINAL
COASTAL ENGINEERING AND ENVIRONMENTAL ASSESSMENT FOR SHORELINE SETBACK VARIANCE APPLICATION

Applicant and Recorded Fee Owner:
Alice L. Stanley Trust
67-419 Waialua Beach Road
Waialua, Hawaii 96791
Telephone (808) 637-1280

Agent:
Sea Engineering, Inc.
Makai Research Pier
Waimanalo, HI 96795
(808) 259-7966

Prepared For:
City and County of Honolulu
Department of Land Utilization
650 S. King Street
Honolulu, Hawaii 96813

July 1993

93-12

I. GENERAL INFORMATION

A. APPLICANT AND RECORDED FEE OWNER:
Alice L. Stanley Trust
67-419 Waialua Beach Road
Waialua, Hawaii 96791
(808) 637-1280

B. AGENT:
Sea Engineering, Inc
Makai Research Pier
Waimanalo, HI 96795
(808) 259-7966

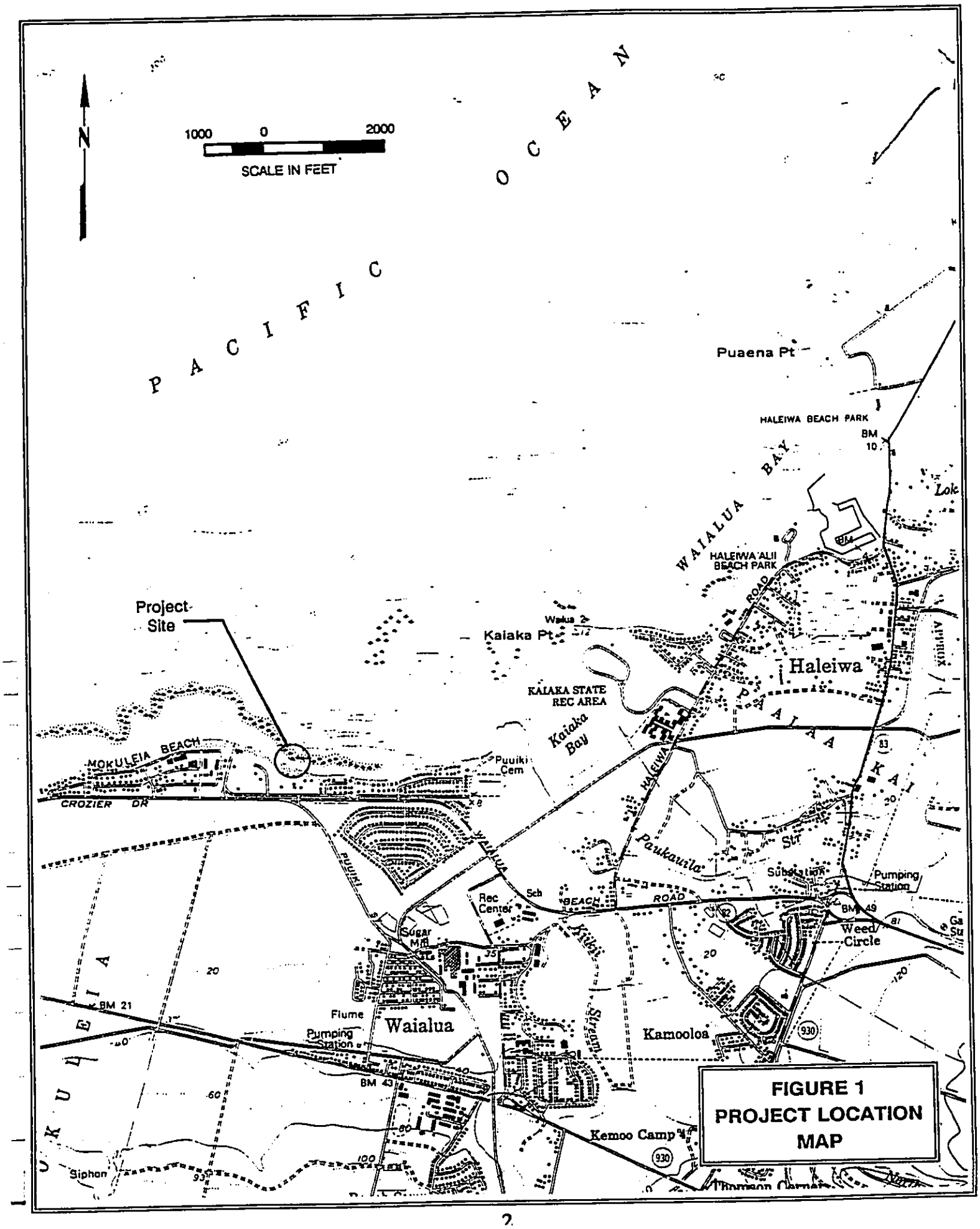
C. TAX MAP KEY: 6-7-13:2, Lot 736 A and 6-7-13:32, Lot 736 B

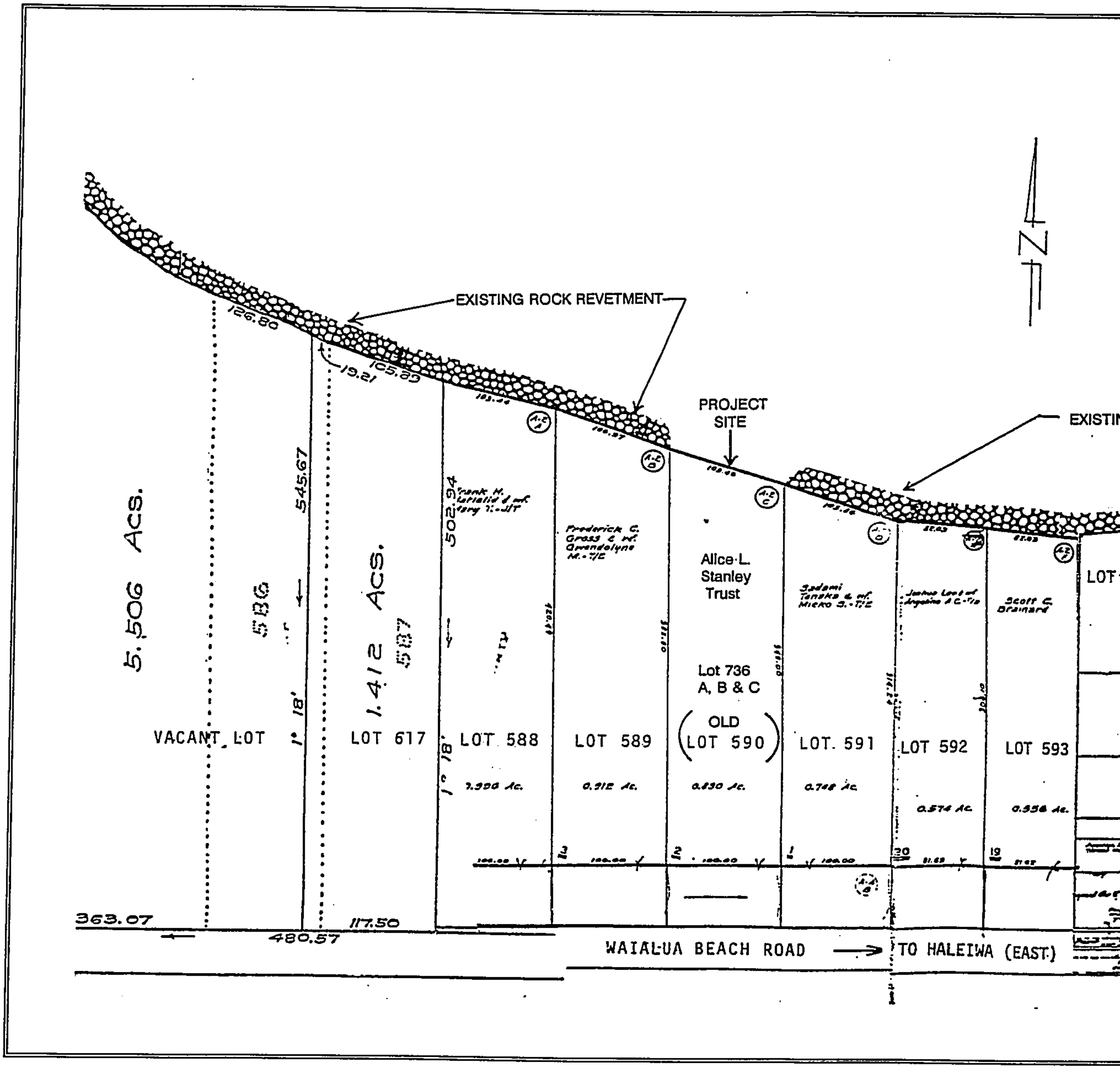
D. TOTAL LOT AREA: Lot 736 A - 12,782 sq. ft.
Lot 736 B - 12,108 sq. ft.

II. DESCRIPTION OF THE PROPOSED ACTION

A. LOCATION AND GENERAL DESCRIPTION

The parcel under consideration for shore protection is located on the northwest shoreline of the island of Oahu, just west of Kaiaka Bay. A general project area location map is shown on Figure 1. The shoreline in the project area is generally considered the east end of Mokuleia Beach, and the residents refer to it as Pu'uiki Beach. The shoreline is divided into house lots as shown on Figure 2. In 1986 the residents on both sides of the applicant constructed rock revetment shore protection, based on approval from the State of Hawaii, Department of Land and Natural Resources (DLNR), to construct the shore protection on State jurisdiction coastal land seaward of the Certified Shoreline. The owner of what was at that time Lot 590 (later subdivided into Lots 736 A,B & C) elected not to construct the rock revetment shore protection, and the property was then sold to Alice L. Stanley Trust in 1992. In 1992 the new and present owner requested approval from DLNR to build a similar revetment on her property, thus connecting the existing revetments on both sides of the Stanley property. The justification for this request was based on continuing erosion of the unprotected Stanley shoreline, which, if unchecked, could eventually threaten their residence, and the fact that the revetments on either side likely contributed to an increased




EXISTING ROCK REVETMENT
PROJECT SITE
5.506 ACS.
1.412 ACS.
545.67
502.94
126.80
105.83
19.21
Alice L. Stanley Trust
Lot 736 A, B & C
OLD LOT 590
VACANT LOT
LOT 617
LOT 588
LOT 589
LOT 591
LOT 592
LOT 593
363.07
480.57
117.50
WAIALUA BEACH ROAD
TO HALEIWA (EAST)

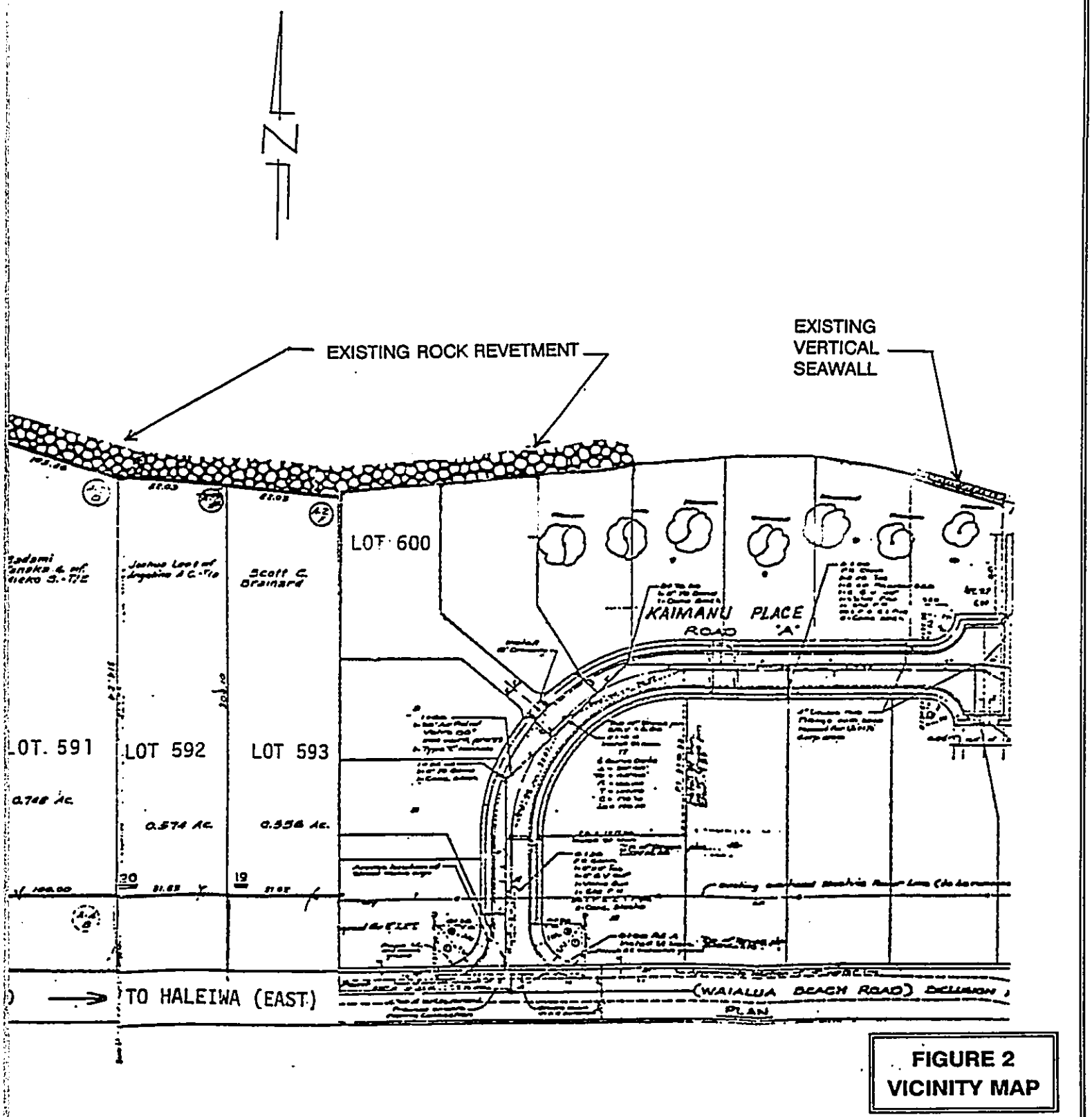


FIGURE 2
VICINITY MAP

erosion rate of the Stanley shore due to turbulence and reflection of wave energy at the revetment ends. In addition, the existing revetments are suffering flank erosion at their ends which abut the Stanley property, and which threatens to damage the revetments. The Stanley neighbor to the west has in fact requested that the Stanleys construct shore protection to eliminate the problem of flank erosion of his revetment. Unfortunately, DLNR denied the Stanley request, stating that approval would not be granted to construct shore protection seaward of the Certified Shoreline, and advising them to seek City and County of Honolulu approval to construct the shore protection in the Shoreline Setback Zone landward of the Certified Shoreline.

The Certified Shoreline (as confirmed by the Board of Land and Natural Resources on April 24, 1992) for Lots 736 A & B is shown on Figures 3 and 4. The proposed shore protection revetment would be constructed immediately landward of the Certified Shoreline and entirely within the 40-foot-wide Shoreline Setback Zone. The location of the proposed revetment with respect to the Certified Shoreline and Shoreline Setback Line is shown on Figure 7.

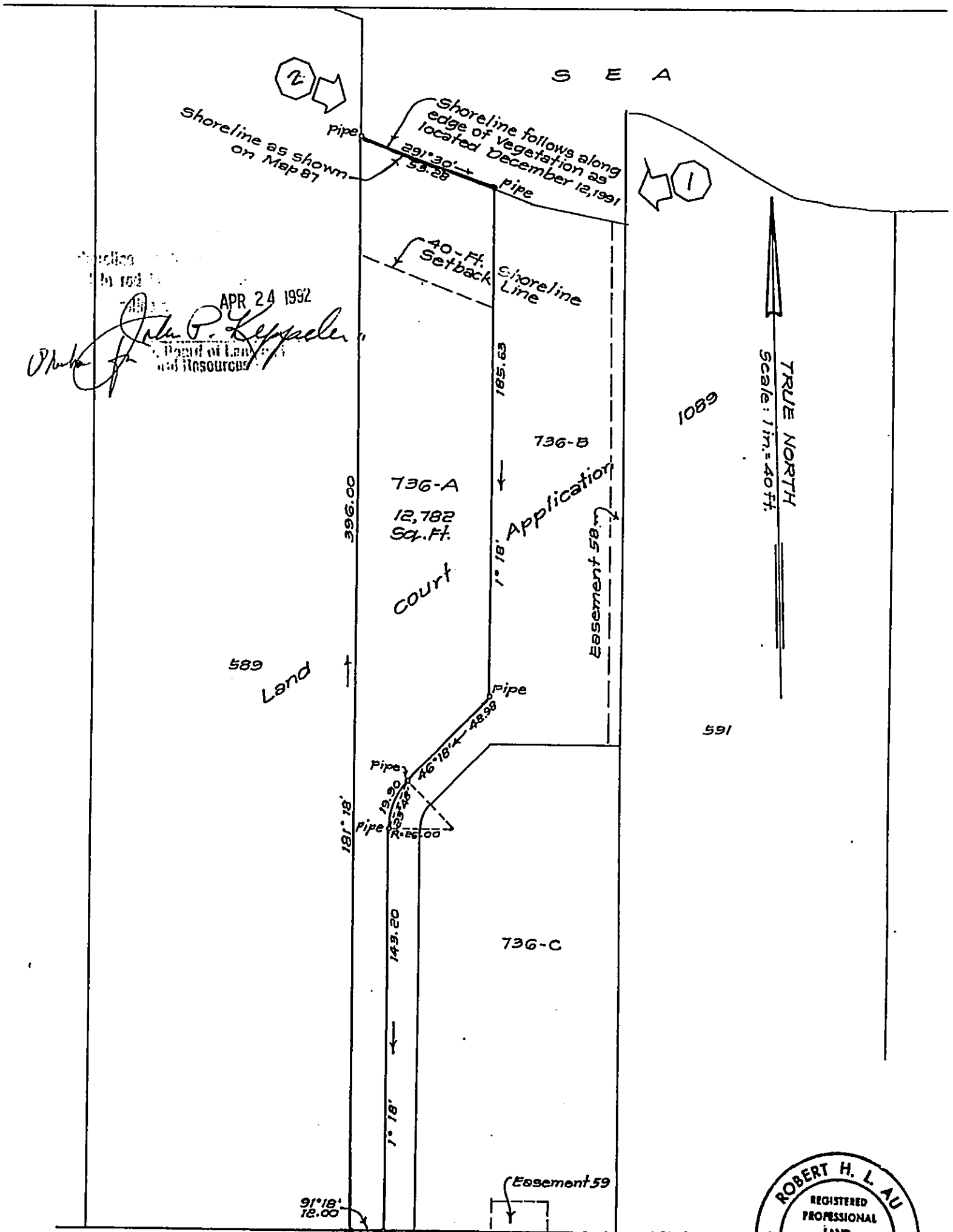
B. COASTAL ENGINEERING EVALUATION

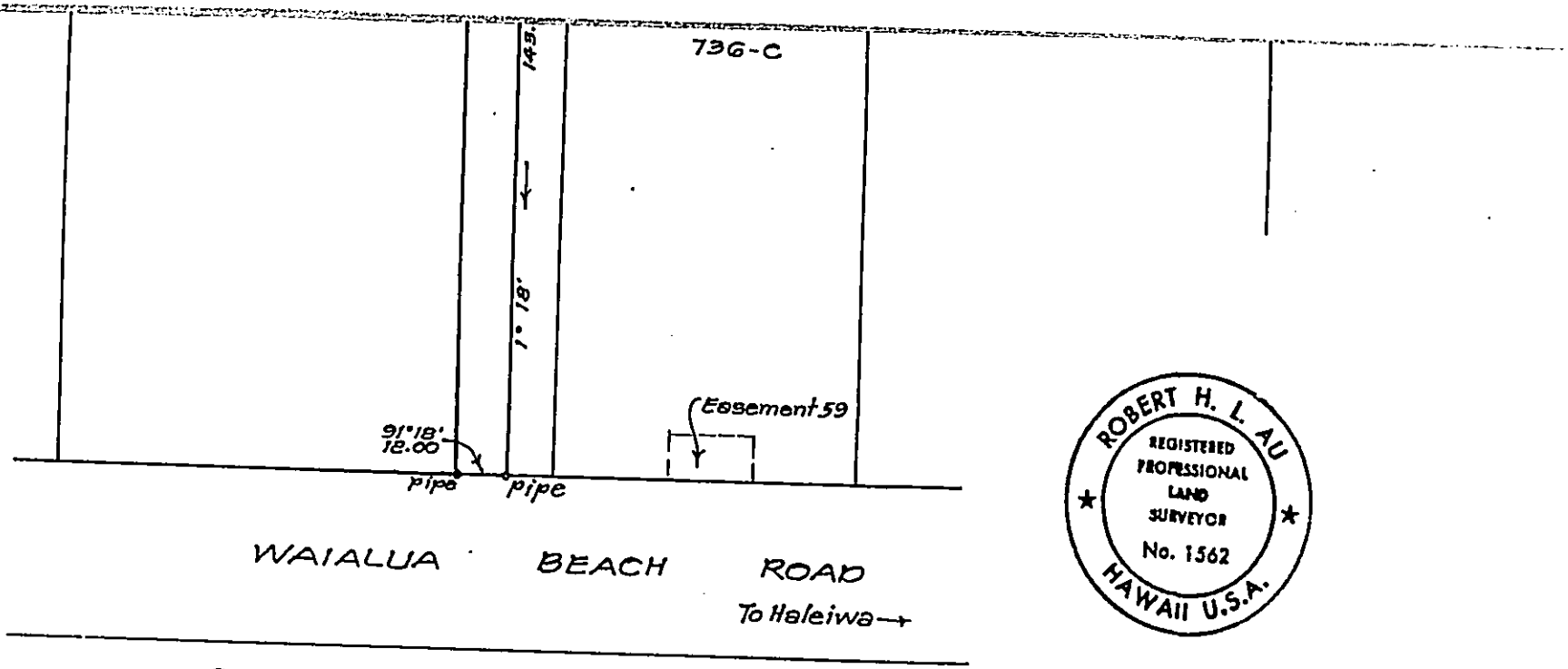
1. Existing Coastal Condition and Characteristics

The coastal sector in the project area consists of a relatively narrow beach, 20 feet wide, composed of medium grained sand of mixed terrigenous and calcareous origin. Erosion is occurring in many areas, as discussed in the Oahu Shoreline Study (Sea Engineering, Inc. 1988 and 1989), although overall East Mokuleia beach is relatively stable. However, it is subject to large fluctuations and the extensive shoreline development is subject to storm waves and tsunami inundation. Significant winter season wave erosion was noted during the winters of 1969 and 1980, and again in 1992 - 93.

The shore is primarily developed as a residential area, with single family homes and apartments. Much of this sector is already committed to shore protection, including vertical seawalls and sloping rock revetments. All of the house lots in the project area, with the exception of the applicant, have rock revetment shore protection, constructed in 1986.

The shore is fronted by an irregular fringing reef, approximately 100 to 150 yards wide, composed primarily of solid reef rock with pockets of sand and coral fragments.


SEA
Shoreline follows along edge of Vegetation as located December 12, 1991
Shoreline as shown on Map 87
Pipe
291°30'
33.25
Pipe
40-Ft. Setback
Shoreline
Line
APR 24 1992
Board of Land and Resources
185.63
736-B
1089
TRUE NORTH
Scale: 1 in. = 40 ft.
736-A
12,782 Sq.Ft.
Court
Application
Easement 58
396.00
1° 18'
589
Land
Pipe
48.98
46°18'
Pipe
19.90
53.48
Pipe
R=26.00
181° 18'
149.20
736-C
591
1° 18'
Easement 59
91°18'
12.00
ROBERT H. L. AU
REGISTERED PROFESSIONAL

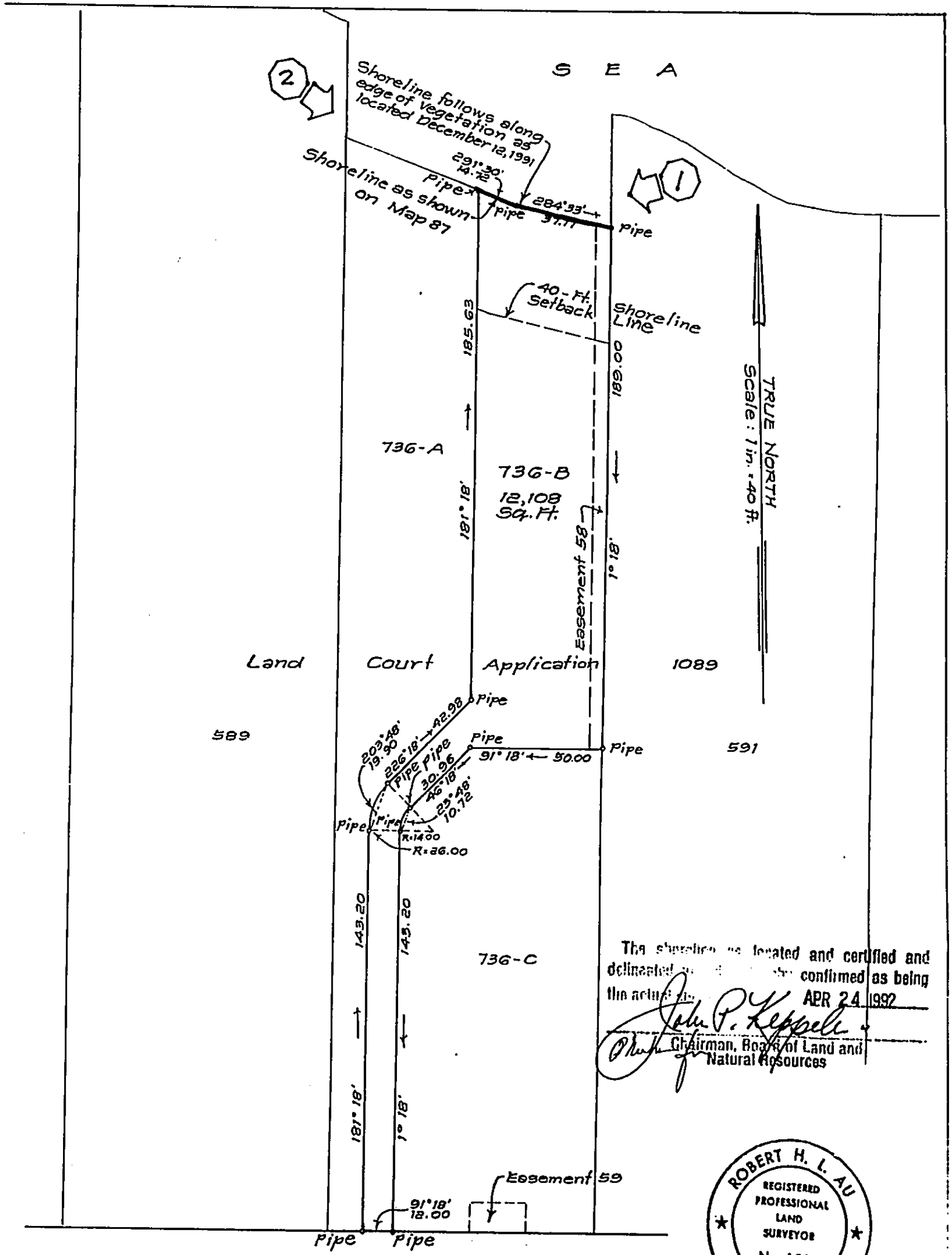


ROBERT H. L. AU
REGISTERED PROFESSIONAL LAND SURVEYOR
No. 1562
HAWAII U.S.A.

SHORELINE LOCATION OF
LOT 736-A
LAND COURT APPLICATION 1089
KAMANANUI, WAIALUA, OAHU, HAWAII.
Tax Map Key: 6-7-13:2
Owners: Alice L. Stanley Trust

By: Robert H. Lau
Registered Professional
Land Surveyor
Certificate Number 1562

FIGURE 3



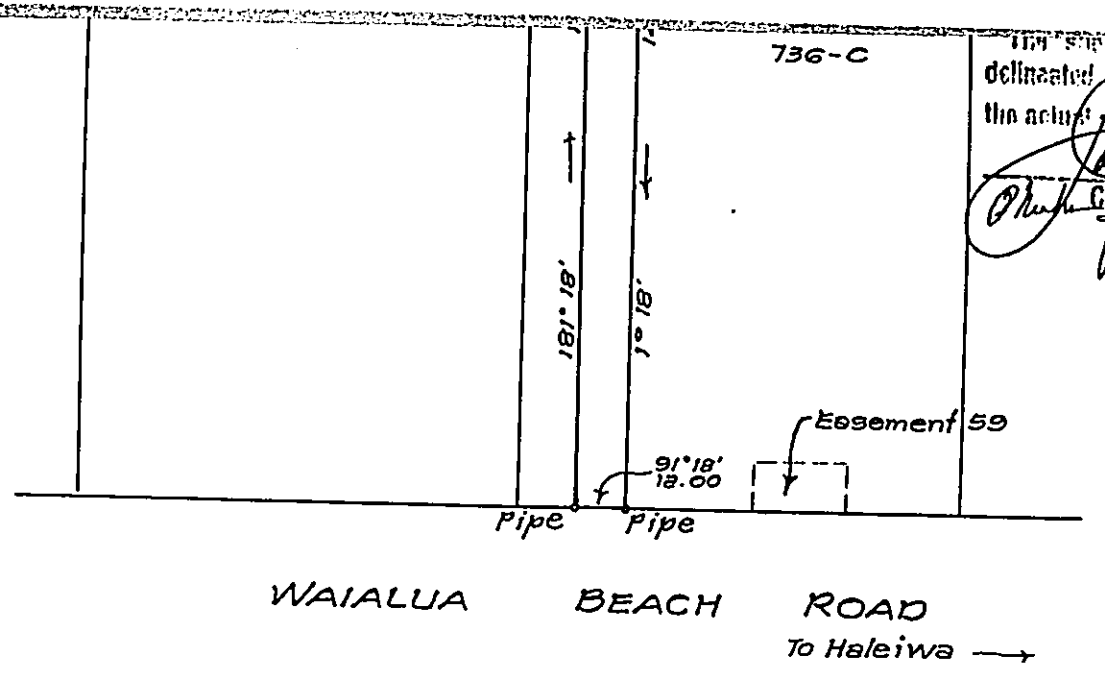
The shoreline as located and certified and delineated thereon is hereby confirmed as being the actual line.

APR 24 1992

John P. Keppeler

Chairman, Board of Land and Natural Resources

ROBERT H. L. AU
REGISTERED PROFESSIONAL LAND SURVEYOR
No. 1512



The shoreline as located and certified and delineated on this map is confirmed as being the actual shoreline.

APR 24 1992

Chairman, Board of Land and Natural Resources

ROBERT H. L. AU
REGISTERED PROFESSIONAL LAND SURVEYOR
No. 1562
HAWAII U.S.A.

SHORELINE LOCATION OF
LOT 736-B
LAND COURT APPLICATION 1089
KAMANANUI, WAIALUA, OAHU, HAWAII.
Tax Map Key: 6-7-13:2
Owners: Alice L. Stanely Trust

BY: Robert H. L. Au
Registered Professional
Land Surveyor
Certificate Number 1562

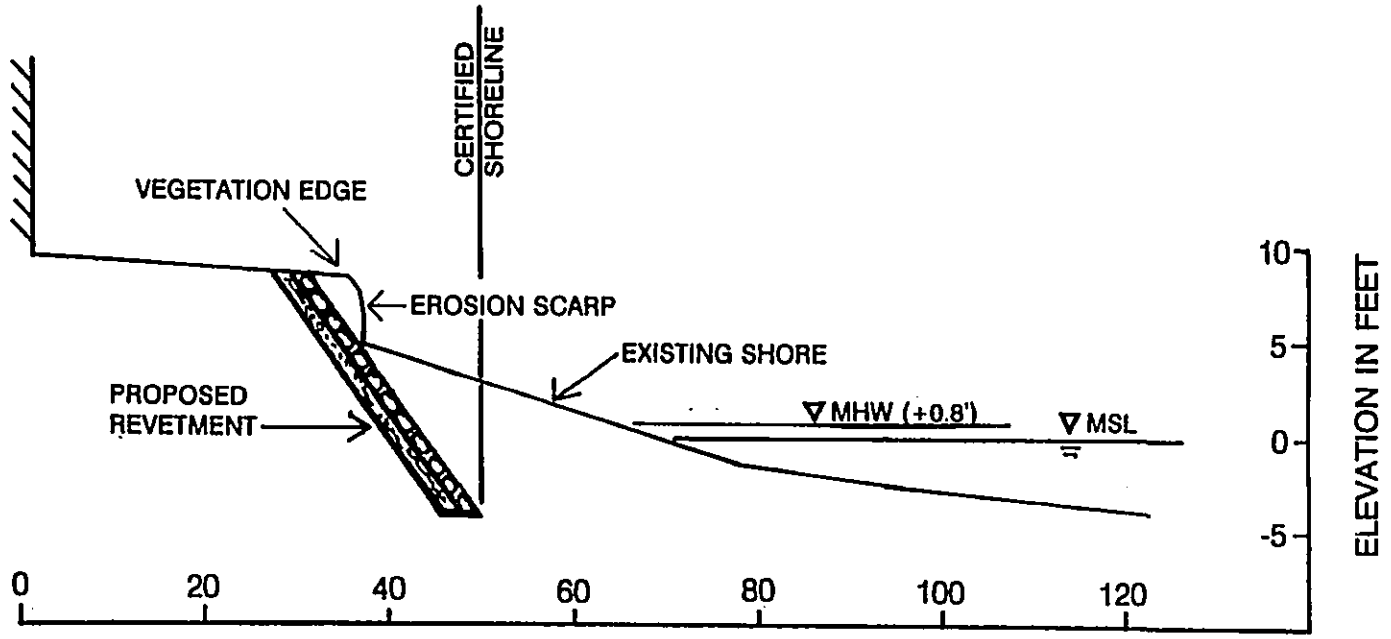
FIGURE 4

The water depth on the reef is about 3 to 5 feet below mean sea level. A relatively deep offshore submarine canyon seaward of the reef edge bisects the project area.

A typical shoreline profile and photographs of the existing shoreline condition on March 16, 1993, are shown on Figures 5 and 6. As can be seen on the profile and photographs the beach is narrow and steep, about 28 feet in width between mean sea level and the vegetation line/erosion scarp, with a slope of about 1V on 5H. A wave cut erosion scarp extends along the entire property width, and during high tide and moderate wave action the upward rush of the waves reaches the base of the scarp, resulting in continuing erosion. The property owner estimates a recession of the vegetation line of about 10 feet during the 1992 - 93 winter.

2. Justification For Shore Protection

The shoreline in the project area is subject to rapid short-term erosion by winter storm waves from the north. This problem was investigated in 1981, following severe winter erosion in 1980 (Sea Engineering, Inc., 1981), and these investigations led to the construction of shore protection revetment along the shore on either side of the applicants property. The unprotected applicants property continues to suffer erosion and a landward recession of the vegetation line, with the erosion likely exacerbated by turbulence and reflection from the existing revetments on both sides. This erosion can be expected to continue, and may eventually pose a serious threat to the Stanley home. In addition, the un-revetted Stanley shore poses a risk to the stability and effectiveness of the neighboring revetment by permitting flank erosion to occur, and which will eventually result in damage to the existing revetments.



HORIZONTAL DISTANCE IN FEET

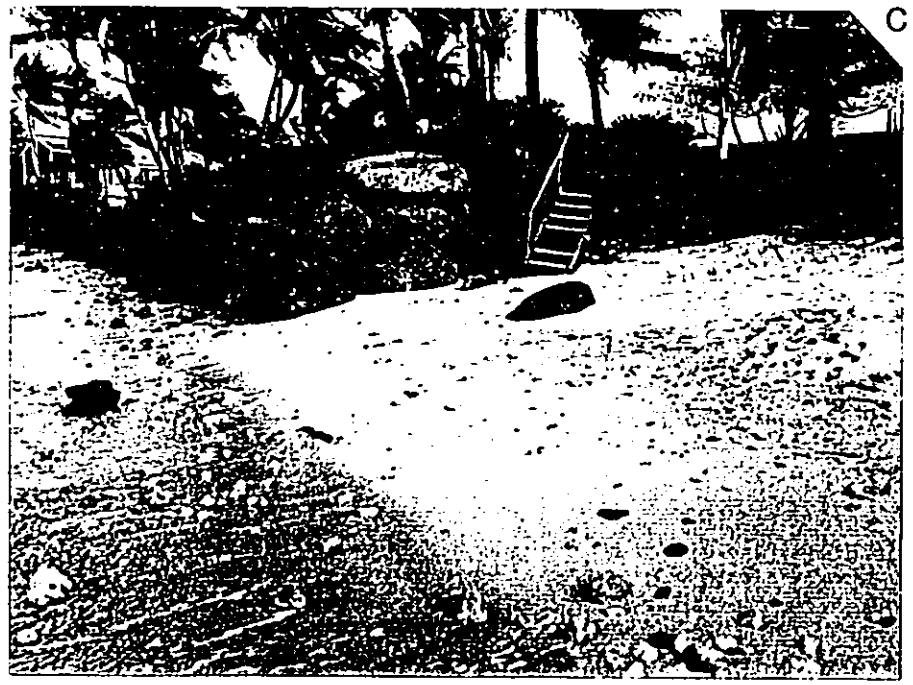
SECTION A-A

NOTE: 2 x VERTICAL EXAGERATION

FIGURE 5
SHORELINE PROFILE
(03/16/93)

A

B



C

A. Looking from West to East

B. Looking West

C. Looking East

FIGURE 6
SHORELINE PHOTOGRAPHS
(03/16/93)

C. PROPOSED SHORE PROTECTION PLAN

1. Description

A sloping rock revetment is considered the best shore protection solution considering the foundation conditions at the site, the desire to retain as much sand seaward of the structure as possible, the availability of suitable stone from Waialua Sugar Company, and the fact that a rock revetment can be tied into the existing rock revetments on both sides of the property. The proposed revetment would be constructed along and mauka of the Certified Shoreline, within the Shoreline Setback area, as shown on Figure 7. The revetment would be constructed with an armor layer of 1,000 to 2,500 pound stone, keyed and fitted, placed over an underlayer of 100 to 250 pound stone and a geotextile filter to prevent scour or leaching of the sand shoreline from between voids in the rock. The revetment would have a crest elevation of +8 feet msl, equal to the existing vegetation line elevation, and would have a side slope of 1V on 1.5H. The toe would be excavated to place the rock on a hard reef rock foundation to reduce the risk of damage due to scour and undermining. A typical revetment cross-section is shown on Figure 8, and a summary of the basis of design is presented in the following paragraphs.

2. Design Analysis

a) Design Water Depth. The toe of the sand and beginning of reef rock is at a depth of about -1.5 feet mean sea level (msl). The design stillwater level (SWL) rise with reference to the msl datum consists of (1) the astronomical high tide, (2) wave setup by nearshore breaking waves, and (3) during unlikely but possible hurricane events, storm surge resulting from onshore winds and reduced atmospheric pressure. The total design water depth at the toe of the structure is the sum of the existing depth below msl plus the stillwater level rise. A summary of the values for these factors during typically prevailing winter north swell conditions and possible hurricane conditions is as follows (hurricane conditions based on Sea Engineering, Inc., 1990):

	Prevailing Conditions	Hurricane
Tide	0.8 feet	0.8 feet
Wave Setup	1.0 feet	4.0 feet
Storm Surge	0.0 feet	0.7 feet
Total SWL Rise	1.8 feet	5.5 feet
Exist'g Depth	1.5 feet	1.5 feet
Design Water Depth	3.3 feet	7.0 feet

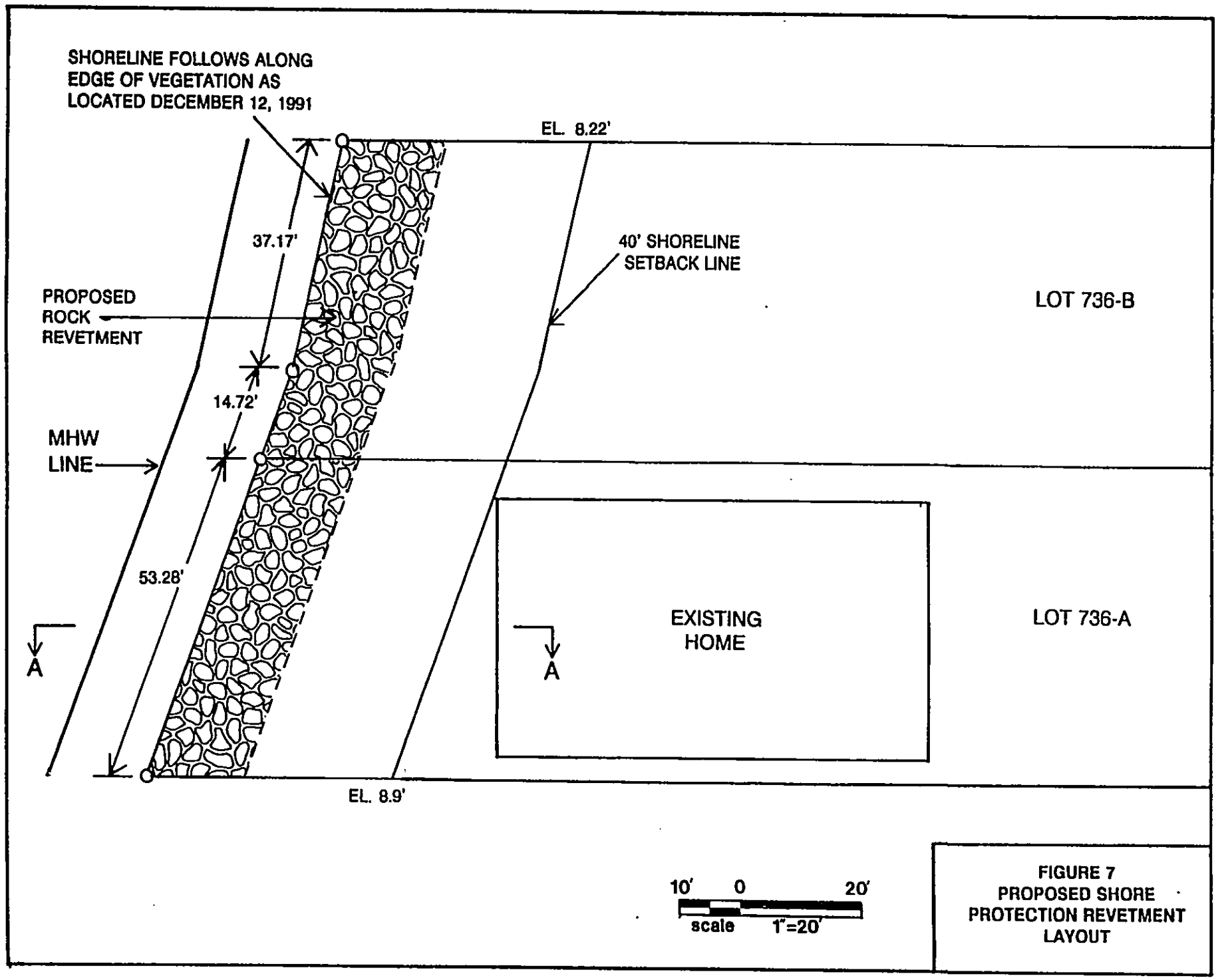
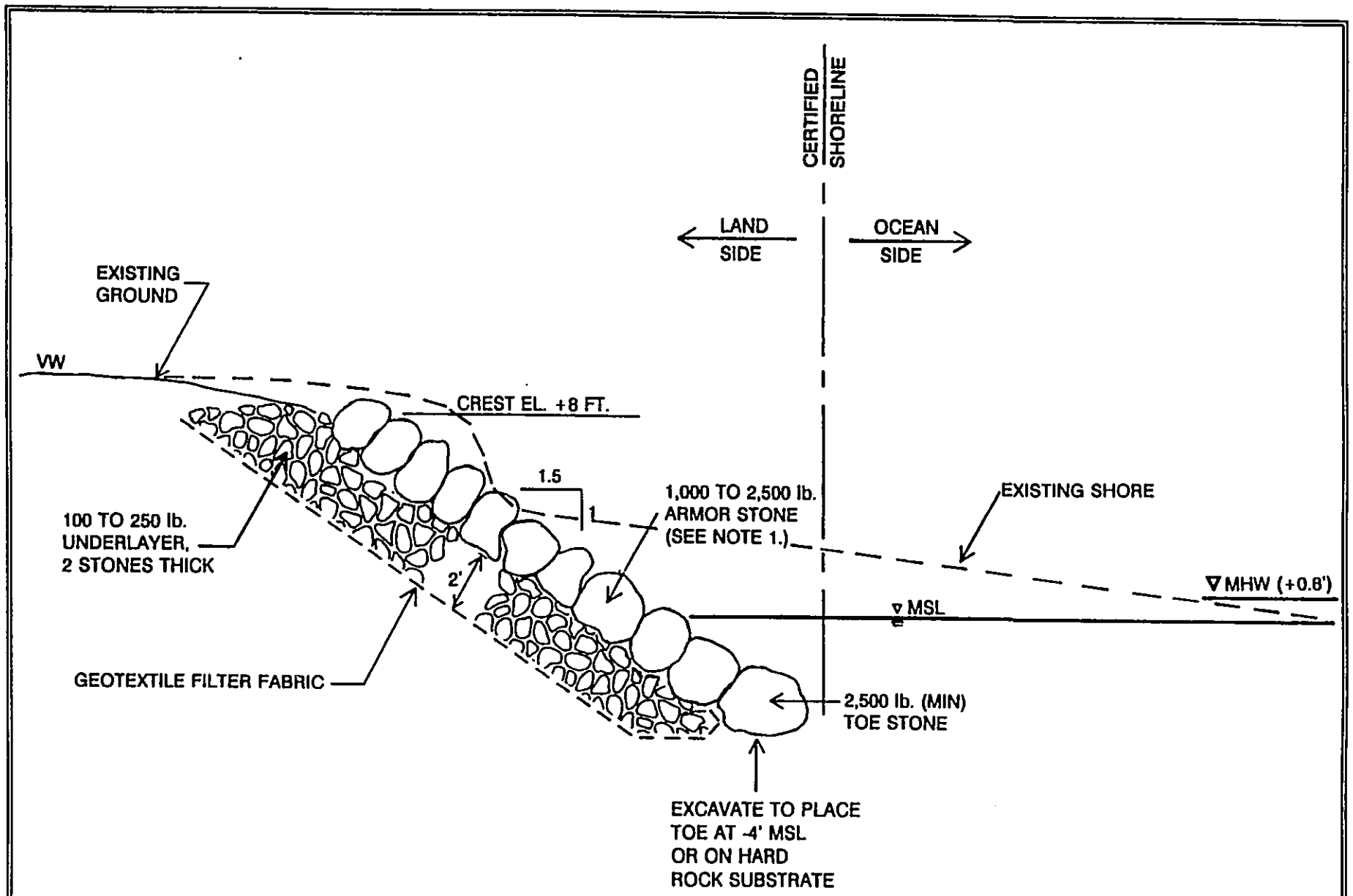


FIGURE 7
PROPOSED SHORE
PROTECTION REVETMENT
LAYOUT



NOTE 1. ARMOR STONE SHALL BE SINGLE LAYER, KEYED AND FITTED, AND IN CONTACT WITH ADJACENT STONES.

FIGURE 8
TYPICAL ROCK REVETMENT CROSS-SECTION
Scale: 1" = 5'

b) Design Wave Height. Large storm waves approaching the coast will break on or seaward of the reef, with smaller waves reforming and propagating shoreward until they ultimately break on the shore. The maximum height of the reformed waves will be limited by the nearshore water depth. Based on the design water depths from the previous paragraph and a nearly flat nearshore reef slope, the design wave heights will be about 3 feet and 5.5 feet for prevailing and hurricane conditions, respectively (based on methodology in the Shore Protection Manual, U.S. Army Corps of Engineers, 1984).

c) Revetment Design.

(1) Armor Stone Weight, $W = \frac{W_r \quad H^3}{K_D \, (S_r\text{-}1)^3 \cot \theta}$

where W = armor stone weight in pounds
W_r = unit weight of stone (160 lbs/ft^3)
H = design wave height (3 and 5.5 feet)
S_r = specific gravity of stone (2.5)
θ = revetment side slope (1V:1.5H)
K_D = stability coefficient (2.0)

Thus W = 425 lbs and 2,600 lbs for prevailing and hurricane conditions, respectively. Use 1,000 to 2,500 lb stone, keyed and fitted as a single layer.

(2) Underlayer Stone Weight = W/10 = 100 to 250 lbs

(3) Filter Layer - The proposed revetment will be founded on sand and earth, and a filter layer must be provided to prevent wave action from removing sand through voids between stones and thus causing settlement of the revetment. Geotextile filter cloth is recommended to retain the sand and relieve hydrostatic pressure from the soil when saturated by rainfall. Recommended filter cloths include "Filter-X" produced by Carthage Mills, "Nicolon Plastic Filter Cloth" by United States Textures Sales Corp., and "Typar" produced by DuPont.

(4) Toe Protection - Wave action against the rock revetment may scour and remove sand from beneath the toe of the structure, causing excessive settling and possible structure failure. To prevent this, the shoreline will be excavated to the hard reef rock substrate in order to place the toe on non-erodible material. Where there is no reef rock substrate, the shore will be

excavated to a minimum depth of -4 feet msl to place the toe below the typical scour depth (the general guideline being one design wave height below the ground surface), and the plastic filter cloth extended under the toe and locked in place by wrapping it around and back into the underlayer stone as shown on Figure 8.

(5) Flank Protection - The properties adjacent to both ends of the proposed revetment have existing shore protection, eliminating the possibility of flank erosion.

(6) Crest Elevation - The crest elevation of the revetment should be high enough to prevent wave overtopping and possible damage to the landward side during prevailing design wave and water level conditions. The calculated wave runup above the design stillwater level is 4 to 5 feet for prevailing extreme winter north swell conditions. Thus the required crest elevation is +8 feet msl.

III. AFFECTED ENVIRONMENT

A. GENERAL DESCRIPTION

The project area is a well-developed residential neighborhood, with primarily single-family homes along the shore. The area is designated by the State as an Urban District, and most of the land is owned in fee by the residents. The closest public park is Pu'uiki Beach Park, located approximately 1,000 feet west of the project site, whose use is restricted to employees of Waialua Sugar Company.

The coast in the project area is exposed to storm waves, and high surf along the coast is a regular occurrence during the winter season. The area is designated as a VE zone on the FIRM map, coastal flood hazard with wave action, base flood elevation 16 feet.

The shoreline in the project area is slightly crescent shaped, with a narrow sand beach backed by shore protection revetment along virtually all of the shore with the exception of the applicants shoreline. An irregular fringing reef extends 300 feet or more seaward of the shoreline, with depths of 3 to 5 feet, composed primarily of solid reef rock with pockets of sand and coral fragments. The reef limits the size of waves which can reach the shore and dissipates wave energy, and thus provides the first line of defense against storm wave action.

B. WIND AND WAVES

The prevailing winds are the northeast tradewinds which generally blow onshore, with an alongshore component, 80 to 90 percent of the time during the summer season from about April to November. During the winter months, there is a general weakening of the tradewind system and the occurrence of southerly and westerly (Kona) winds due to frontal influences from the north temperate zone and local low pressure systems.

Waves arriving at Mokuleia Beach are primarily generated in the northwest to northeast sector of the Pacific Ocean. Two primary wave types affect the beach: (1) northeast tradewind waves, and (2) north swell. Trade-wind-generate waves may be present throughout most of the year but are most frequent during the summer months when they dominate the local wave climate. Typically, these deepwater waves have periods ringing from 6 to 10 seconds and height of 4 to 12 feet. Generally, tradewind waves are present from 60 to 70 percent of the time during the remainder of the year. North swell is generated in the North Pacific Ocean by winter storms and typically has wave heights up to 15 feet and approaches from the directions northwest to north-northeast. North swell usually occurs between October through March. Other wave types which may affect the study area less frequently than the primary types are local severe storm and infrequent but possible hurricane waves. Storm and hurricane waves have a potential for rapid short-term erosion with long-term impacts on shoreline position.

Incoming waves are transformed by the processes of refraction, shoaling, bottom friction, and breaking as they near shore. Larger waves break offshore on or seaward of the reef, and only a small portion of the incoming wave energy actually reaches the shoreline. The effect of the submarine canyon on the incoming waves is unknown; however, it likely permits more energy to reach the shore and greatly influences the nearshore wave direction.

C. COASTAL PROCESSES

Hawaii's beaches are generally very dynamic and subject to rapid changes resulting from seasonal and long-term oceanographic and meteorological conditions. A beach will change its position and form in response to the incident waves. Important wave characteristics affecting sand movement near the shoreline are the height and direction of waves breaking on the beach. Breaker height is significant in determining the quantity of sand in motion, and the angle of the breaking wave on the beach is a major factor in determining the longshore transport direction and rate. Sand is transported in two ways; alongshore transport and onshore-offshore exchange. Waves breaking at an angle to the beach generate

a long-shore current which can move sand away from the direction of wave approach. Onshore-offshore movement of sand results from the exchange of sand between the fringing reef and the beach.

It is theorized that in the project area the sand is transported toward the west during easterly tradewind wave conditions (generally the summer period), and during periods of north swell and the absence of tradewinds (the winter period) the sand transport is to the east. This general transport pattern is supported by seasonal beach changes as noted by the residents. Beach systems in Hawaii are primarily confined in cells, defined by natural or man-made physical features which restrict the movement of sand. Kaiaka Bay, on the eastern side of the study are, presents an impassable barrier to alongshore sand movement from the east. Thus, during protracted periods of sand movement from east to west, there would be a net loss of sand from the study area as mp sand would be coming into the area to replace that being moved out.

The study area is susceptible to rapid erosion during periods of high water levels and large north swell. The high water levels permit higher steeper waves to reach the shore. These storm waves often cut a vertical scarp into the beach, which then facilitates more rapid erosion by smaller waves which otherwise might not create an erosion problem. Very severe and rapid erosion has been observed to occur notably in December 1969, in February 1980, and recently in February 1993. It is possible that sand may be carried sufficiently far offshore during periods of high water levels and sever storm wave attack to be lost to the beach system.

D. FLORA AND FAUNA

The following description of nearshore flora and fauna in the project vicinity is taken from the Oahu Coral Reef Inventory (AECOS, 1980.).

Coral cover on the reef flat fronting Kaiaka Point and Kaiaka Bay is generally low, not exceeding 5 to 10%. Pocillopora meandrina is the most abundant species. Algal cover, on the other hand, is high, ranging between 20 and 60% of the bottom. Turbinaria ornata is most abundant, followed by Dictyopteris sp. The sea urchin, Tripneustes gratilla, is conspicuous. Fishes most often observed on the reef fronting Kaiaka Bay include Acanthurus triostegus, A. nigrofuscus, Thalassoma duperreyi, and Stegastes fasciolatus. Most individuals are juveniles.

Coral cover on the reef flat off Pu'uiki Beach does not exceed 5% of the bottom. Algal cover is about 20% on the upper reef slope, but reaches 80% at greater depths on the reef

slope. Olva reticulata, Galaxaura sp., and Porolithon gardineri are most conspicuous on the upper reef slope.

E. USE

Pu'uiki Beach is protected by a shallow fringing reef, however, swimming is only fair because inshore waters are often turbid, and only a few sand pockets in the shallow reef can accommodate swimmers at high tide. Although inshore waters are safe most of the time, currents are strong during periods of rough seas. Dangerous currents and shallow bottom are potential hazards. The portion of beach that winds around the promontory west of the project site is privately owned. Use is limited to employees of Waialua Sugar Plantation, and the beach is not open to the public. There is no convenient public access to any part of the beach west of Kaiaka Bay.

The area from Kaiaka Point to Pu'uiki Beach Park receives moderate to heavy fishing use. Pole fishing for papio, ulua, 'o'io, and goatfish the throw-netting extends from Kaiaka Bay along the coast to Pu'uiki Beach Park. Net fishing and trapping of reef species and ornamental fish collecting are common off the shore. Spearfishing is concentrated west of Kaiaka Bay towards Pu'uiki Beach Park.

IV. ALTERNATIVES CONSIDERED

A. NO ACTION

Taking no action can be a viable alternative if the beach is relatively stable over a long period of time and if only minor damage may result during storm wave attack. However, considering the vulnerability of the shoreline to rapid erosion as evidenced by past storm wave damage, including a 10-foot virtually overnight loss in February 1993 during a period of high surf coupled with high tide, and the fact that the vegetation line is within about 30 to 35 feet of the house, making the house increasingly vulnerable to damage by storm waves, taking no action is not considered an acceptable solution.

B. SEAWALL

Seawalls are vertical concrete or grouted masonry walls used to protect the land from wave damage, with use as a retaining wall a secondary consideration. A seawall, if properly designed and constructed, is a proven, long lasting, relatively low maintenance shore protection method. The structure requires limited horizontal space along the shoreline, and

stairs may be provided for access to the water. Masonry gravity walls are commonly used for shore protection in Hawaii. This type of wall may be constructed of cast-in-place reinforced concrete or of individual rocks grouted in place. The near vertical seaward faces of seawalls causes two problems. Wave energy is deflected both upward and downward. The downward component can cause sever scour at the base of the wall, particularly in shallow waters and, thus, adequate toe protection is required. Ideally the wall should be constructed on solid, non-erodible substrata. Undermining of the tow is one of the most common causes of seawall failure. Seawalls are inflexible structures and failure of one section can often initiate failure of the entire wall. Because they dissipate little wave energy, smooth, vertical seawalls are also more easily overtopped by waves and spray than sloping irregular walls.

C. REVETMENT

A revetment is a facing of erosion-resistant material whose primary purpose is to protect a shoreline from direct erosion by waves and is one of the surest time-proven shore protection measures. The most common method of revetment construction, and generally the most satisfactory, is to place armor stone sized according to the design breaking wave height over an underlayer and bedding layer designed to distribute the weight of the armor stone and to prevent the lost of shoreline material (sand) through voids in the revetment. Generally, the slope of the revetment should not be steeper than 1 vertical to 1.5 horizontal. Properly designed rock revetments are durable, flexible, and highly resistant to wave damage. Should toe occur the structure can settle and readjust without major failure, and the revetment can still function effectively even if damaged. The rough surface reduces wave runup and overtopping, and the rough surface and flatter slope absorb more wave energy than smooth vertical walls, thus reducing wave reflection and the resultant loss of beach seaward of the structure. However, the sloping structure requires considerable horizontal space and, therefore, occupies a greater shoreline area.

D. RECOMMENDED ALTERNATIVE

A sloping rock revetment is considered the best shore protection solution considering

(1) it is consistent with the shore protection on both sides of the applicants property;

(2) it would minimize as much as possible the loss of sand seaward of the structure; and

(3) suitable stone is available at reasonable cost from the Waialua Sugar Company.

V. POTENTIAL IMPACTS OF THE PROPOSED SHORE PROTECTION

The proposed rock revetment would provide the protection required for the homeowners during storm wave attack. If no protection is provided, the property and home will continue to be vulnerable to erosion and wave damage.

The proposed rock revetment would not significantly change the overall natural coastal processes of Pu'uiki Beach. When the beach fronting the revetment is wide and the wave uprush does not reach the base of the structure, the revetment will be out of the zone of active sand transport and would thus have no impact. Even during periods of severe erosion when the toe of the revetment is in the water, the longshore transport zone for sand movement will encompass the entire nearshore surf zone and there will remain an avenue for transport of sand to the north or south past the revetment.

The proposed revetment would abut existing rock revetments on both sides of the applicants property, thus there would be no adverse impact to adjacent properties. In fact, the proposed Stanley revetment will be of considerable benefit to the neighbors by preventing flank erosion and damage to the existing revetments.

VI. RESPONSE TO DRAFT EA REVIEW COMMENTS

Response to the Draft Coastal Engineering and Environmental Assessment was received from the following government agencies and general public:

Federal:	Department of the Army, US Army Engineer District, Honolulu
State:	Office of Environmental Quality Control Department of Health
City and County:	Department of Public Works Department of Parks and Recreation
Public:	Michael Parke

Letters from the above reviewers are included in Appendix A, and the following information is provided in response to review comments.

<u>Office of Environmental Quality Control, State of Hawaii</u>

Comment: Include a list of all agencies consulted during the preparation of the EA.

Response: The following agencies were consulted during preparation of the EA:

US Army Engineer District, Honolulu

Department of Land and Natural Resources, State of Hawaii - Office of Conservation and Environmental Control Oahu District Land Manager

Department of Land Utilization, City and County of Honolulu

Comment: Provide the findings and reasons to support the determination.

Response: The need for shore protection is based on the following findings and reasons.

1. The shoreline in the project area is subject to rapid short-term erosion by winter storm waves and high surf from the north. If no protection is provided, the property and home will continue to be vulnerable to erosion and wave damage.

2. The adjacent properties on both sides of the applicant have existing rock revetment shore protection, constructed in 1986 based on approval from the State DLNR, which eliminates the possibility of adverse impacts to adjacent properties, and from which wave reflection at the revetment ends exacerbates erosion of the applicants unprotected shoreline.

3. The unprotected applicants property permits flank erosion of the existing adjacent revetments, which is resulting in damage to them, thus the applicants revetment will actually benefit the adjacent neighbors.

4. The applicants proposed shore protection would not significantly change the existing shoreline characteristics and processes in the project vicinity.

<u>Department of Public Works, City and County of Honolulu</u>

Comment: The EA should address the potential impact of storm water discharge associated with construction activities on water quality of the receiving waters.

Response: The existing unprotected shoreline, with its vertical erosion scarp, results in earth and topsoil being introduced into the water during periods of erosion. Construction of the revetment would eliminate this problem. During

construction, a beach berm would be maintained between the revetment trench and the ocean, which would restrict storm water runoff from entering the ocean, and only clean, natural beach sand would be excavated in the vicinity of the revetment toe.

Comment: The EA should also state what structural or non-structural best management practices (BMP) will be provided to control and reduce discharge of pollutants resulting from construction operations.

Response: Construction material shall consist only of geotextile filter fabric, large stone and boulders, no earthen material or clay/silt/sand sized material shall be utilized or introduced into the water. Stone shall be placed immediately following any necessary excavation of beach sand to place the revetment toe so as to leave no open trenches susceptible to erosion. A beach berm will be maintained between the revetment construction and the ocean to reduce erosion and sediment input to the water. Construction equipment will operate only from land, no equipment will be in the water, and no oil or grease from construction equipment will be introduced into the water.

Michael Parke

Comment: Existing shore protection structures should not have been built and should be removed.

Response: The existing shore protection structures on both sides of the applicant were built with proper approval from DLNR, and the property owners have no known intention of removing them.

Comment: The existing shore protection structures increase the applicants erosion problem.

Response: Concur, and without protection the applicant will continue to suffer erosion problems stemming partly from the presence of the existing structures.

Comment: Erosion of this beach is seasonal and episodic, not continuous.

Response: Erosion is considered to primarily relate to periods of high surf and storm waves, however the long-term net result has been shoreline recession and loss of land as well as beach. There is no reason to believe this will not continue if the shoreline is left unprotected.

Comment: If any form of erosion intervention is absolutely necessary, beach nourishment should be used.

Response: Beach nourishment is not considered practical or reasonable for such a small, isolated shoreline segment, particularly one with direct exposure to wave action and with existing structures on both sides which contribute to the erosion problem.

Comment: This seawall presents a grave threat to both the beach resources and beach access in the area.

Response: The implementation of shore protection for the applicants property will not significantly change the existing coastal processes or access in the vicinity of the project. The presence of existing structures for five hundred feet in either direction makes this essentially a moot point.

REFERENCES

AECOS, Inc. 1980. Oahu Coral Reef Inventory. Prepared for the U.S. Army Corps of Engineers, Pacific Ocean Division.

Sea Engineering, Inc. 1988 and 1989. Oahu Shoreline Study, Part I and II. Prepared for City and County of Honolulu, Department of Land Utilization.

Sea Engineering, Inc. 1990. Windward Oahu Hurricane Vulnerability Study - Waialua District. Prepared for the U.S. Army Corps of Engineers, Pacific Ocean Division.

U.S. Army Corps of Engineers, Coastal Engineering Research Center. 1984. Shore Protection Manual.

APPENDIX A

DRAFT EA REVIEW RESPONSES

JUN 0 3 RECD

DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF
Operations Division

June 1, 1993

Mr. Scott Sullivan
Sea Engineering, Inc.
Makai Research Pier
Waimanalo, Hawaii 96795

Dear Mr. Sullivan:

This responds to your letter dated May 26, 1993 asking for a reassessment of the Alice L. Stanley Trust Rock Revetment project in Waialua, Oahu. In our previous May 25, 1993 letter to the Department of Land Utilization, we had determined that a DA permit was required for the project. However, you submitted revised drawings which showed the work to be approximately 15 feet shoreward of the mean high water line. Furthermore, you explained to my staff that the construction of the revetment could be accomplished while maintaining a beach berm between the revetment trench and the ocean.

Based on the above understanding, a Department of the Army (DA) permit is not required for the proposed revetment. By copy of this letter, we will notify the owners and the Department of Land Utilization of this change.

A new file number, NP93-112, is assigned to this project. Please reference it in any future correspondence. If you have any questions please contact my staff at 438-9258.

Sincerely,

for Michael T. Lee
Chief, Operations Division

JOHN WAIHEE
GOVERNOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

BRIAN J. J. CHOY
Director

'93 MAY 20 AM 8 11

DEPT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

May 19, 1993

Mr. Donald Clegg
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention: Mr. Arthur Challacombe

Dear Mr. Clegg:

Subject: Draft Environmental Assessment for the Alice L. Stanley Trust Proposed Construction of a Rock Revetment, TMK 6-7-13: 2 & 32, Waialua, Oahu

Thank you for the opportunity to review the subject document. We have the following comments:

1. Please include a list of all the agencies consulted during the preparation of the environmental assessment; and

2. Provide the findings and reasons to support the determination.

If you have any questions, please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Brian J. J. Choy

Brian J. J. Choy
Director

c: Alice L. Stanley
SEA Engineering, Inc.

JOHN WAIHEE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

'93 JUL 1 AM 8 21
DEPT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

In reply, please refer to:

June 24, 1993

93-145/epo

Mr. Donald A. Clegg
Director, Department of Land Utilization
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Clegg:

Subject: Environmental Assessment, Chapter 343, HRS
Projects within the Shoreline Setback

Project Name: Alice L. Stanley Trust Rock Revetment
Location: 67-417 and 67-419 Waialua Beach Road
Waialua, Oahu
Tax Map Key: 6-7-13: 2 and 32

Thank you for allowing us to review and comment on the subject project. We do not have any comments to offer at this time.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

'93 JUN 9 AM 10 14

OF LAND UTILIZATION
COUNTY OF HONOLULU

FRANK F. FASI
MAYOR

C. MICHAEL STREET
DIRECTOR AND CHIEF ENGINEER

FELIX B. LIMTIACO
DEPUTY DIRECTOR

ENV 93-135

June 8, 1993

MEMORANDUM

TO: DONALD A. CLEGG, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: C. MICHAEL STREET, DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL ASSESSMENT (EA)
ALICE L. STANLEY TRUST ROCK REVETMENT
TMK: 6-7-13: 2 AND 32

We have reviewed the subject EA and have the following comments:

1. The EA should address the potential impact of storm water discharge associated with construction activities on water quality of the receiving waters.

2. The EA should also state what structural or non-structural best management practices (BMP) will be provided to control and reduce discharge of pollutants resulting from construction operations.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at local 4150.

for C. MICHAEL STREET
Director and Chief Engineer

93-03778

DEPARTMENT OF PARKS AND RECREATION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

WALTER M. OZAWA
DIRECTOR

ALVIN K.C. AU
DEPUTY DIRECTOR

May 21, 1993

TO: DONALD A. CLEGG, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: WALTER M. OZAWA, DIRECTOR

SUBJECT: ENVIRONMENTAL ASSESSMENT, CHAPTER 343, HRS
PROJECTS WITHIN THE SHORELINE SETBACK
ALICE L. STANLEY TRUST ROCK REVETMENT
67-417 AND 67-419 WAIALUA BEACH ROAD
WAIALUA, OAHU, HAWAII
PROJ. REF. NO.: 93/SV-005 (AC)

We have reviewed the Environmental Assessment for the above-described project and have the following comments.

While we believe that such projects may eventually block lateral shoreline access, this case is unique and, therefore, we have no objections to the project.

Thank you for the opportunity to comment on this project.

Should you have any questions, please contact Lester Lai of our Advance Planning Branch at extension 4696.

for WALTER M. OZAWA, Director

WMO:js

June 28, 1993

'93 JUN 30 PM 1 43

DEPT OF LAND UTILIZATION
CITY & COUNTY OF HONOLULU

Art Challacome
Environmental Division
Department of Land Utilization
Honolulu Municipal Building
650 S. King St.
Honolulu, HI 96813

Dear Sir:

I am writing to express my concern and objection to a potential negative declaration required for a waiver of the shoreline setback rules and for a Special Management Area Permit for a proposed seawall on the Mokuleia coastline (TMK 6-7-13:2). This is merely the latest attempt by property owners to fortify the shoreline in this area, despite the potentially devastating long-term consequences for the natural resources of the area, and public beach users.

Emergency permits were granted by the DLNR in 1985 to the adjacent property owners in this area to try to arrest wave-caused erosion of their property. These permits allowed boulders to be placed in specific areas to prevent the loss of certain trees. Instead, over a two year period, an unconsolidated rock wall was constructed fronting all of the properties, except the current applicant. This wall was built in increments on State beach land, and fill was put behind the walls on TMK 6-7-13-3 and 6-7-13-5. The State surveyor allowed the other walls to be built on State beach lands by certifying the shoreline at the front edge of the already constructed walls, despite photographic evidence that such a determination would place the certified shorelines makai of the wash of the waves. All the property owners built walls except for the owner of TMK 6-7-13-2.

Subsequently, in the years betwween 1986 and 1993, the shoreline has experienced continued erosion, as predicted by many ocean engineers and by Dennis Hwang, who has labeled the Mokuleia shoreline as a hazardous, migrating shoreline, which should have stricter setback requirements than other, more stable shoreline areas. As a consequence, there is now beach area between the rock wall that was constructed and the vegetation lines of the property owners. No wall was constructed in front of the current applicant's property, and the erosion has been even worse, due to rebound and edge effects of the wall. Again, this is predictable, and has happened wherever seawalls have been constructed on sandy beaches. It makes little difference if the wall is a vertical concrete structure, or unconsolidated boulders with 4-5 foot diameters. Both cause aggravated erosion on neighboring properties if they are located in the active wave-wash zone.

Despite this obvious short-term loss to the applicant caused by the quasi-legal walls on the beach on either side of her property, future property loss is not necessarily a foregone conclusion. For one thing, I have petitioned the Land Management Division of the DLNR to have the loose boulders (which is all that remains of the wall) removed from the beach. Second, the beach has probably attained a type of temporary equilibrium condition, and

accretion may take place in the area in the future. In fact, the certified shoreline for TMK 6-7-14-20 moved seaward between 1981 and 1986. This either demonstrates episodic accretion, or incompetence of the State surveyor. Unless the applicant supplies various certified shoreline surveys to document the claims of lost property, and demonstrates an immediate risk to her dwelling, a permanent seawall should not be allowed.

Additionally, even if such erosion were real and demonstrable, it would supply a stronger argument against the proposed repairs of the rock wall. Various Hawaii Coastal Zone Management Program reports identify this area of Oahu as part of a dynamic shoreline, subject to periodic episodes of accretion and erosion. In such areas, a seawall, even if constructed of huge boulders instead of solid concrete, would probably disrupt beach processes in the area, and lead to beach erosion, as opposed to shoreline erosion. The beach width in the area has shown a long-term tendency to narrow over the last 30 years, while the shoreline has shown some evidence of long-term accretion. The conclusion to be drawn is that the beaches in Mokuleia are threatened by erosion as much as private property shorelines are threatened. In some cases, the private shorelines may actually be accreting. These studies recommend that non-structural measures are the most appropriate management responses to shoreline erosion, because beach preservation should be the priority for this relatively undeveloped area. THe current applicant should have been aware that her property was subject to this type of seasonal erosion, and because her beachfront parcel in this case is quite large, could easily have located her residential structures further mauka from the shoreline than mandated by County setback laws. Instead, she chose to locate it as close to the beach as possible. She should have to live with the consequences of this indiscrete action. If she is allowed to build a seawall, the public suffers for her lack of judgement by loss of beach and beach access. If any form of erosion intervention is absolutely necessary, beach nourishment should be used. Structural responses such as seawalls and revetments are particularly inappropriate in areas that have dynamic shorelines such as Mokuleia, because such structures interfere with the littoral processes that maintain beach and shoreline equilibrium, and ultimately lead to degradation of the beach resources. I would not want Mokuleia to become another Lanikai or Kahala. I believe that you should deny any requests for construction of this seawall because erosion in this area is seasonal and episodic, but not continuous. No structures are under immediate danger, and the property is sufficiently large to accomodate re-location of the present structures, if the erosion can be proven to be continuous, which is questionable.

I contend that construction of such a wall in the dynamic Mokuleia coastal area should not be allowed, and if subjected to the proper critical rigor during this application process would never be allowed. A large permanent rock revetment would merely exacerbate the mistakes made in granting the emergency permits that led to the unconsolidated wall. The current rocks are out of place, a new cosolidated wall would be even more out of place, and should never have been permitted. If the dominant geophysical and oceanographic characteristics of the coastal zone in Mokuleia are considered, this seawall (and any others proposed), present a grave threat to both the beach resources and beach access in the area. Shore protection structures are inappropriate on beach areas, because they lead to increased beach erosion, as well as erosion of adjacent unprotected properties (as evidenced in this case). This beach degradation should have been a consequence anticipated by the planners at OCEA responsible

for evaluating the original emergency proposals. Please do not continue the shortsightedness demonstrated by OCEA and the Board of the DLNR, and continue to disregard the public beach resources. Instead of facilitating development which is strictly in the interests of the private landowner, consider and give more weight to the potential negative impacts on the beaches and surrounding reef and ocean environment. Please require a full blown EIS in this case, to discourage the owner from pusuing the option to construct a wall. and require the property owners to remove the boulders from the beach. At the very least require an updated shoreline survey before any repair work is commenced. If this work is approved, and other walls are built in the future, I foresee a whole series of walls that would undoubtedly lead to a loss of both the beach and reef resources in Mokuleia, which would be an inestimable and irreversible loss to all the people of Hawaii.

Your prompt attention and response to this letter would be greatly appreciated, in order to allow me to pursue whatever action is necessary to stop this proposed repair action before it has a chance to begin.

Sincerly,

Michael Parke
1777 East West Rd.
Box 1210
Honolulu, HI 96848

cc. OEQC