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GOVERNOR OF HAWAII



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DEPARTMENT OF LAND AND NATURAL RESOURCES

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WILLIAM W. PATY, CHAIRPERSON
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MAY 7 1990

FILE: OA-4/4/90-2363
DOC.: 5359E

MEMORANDUM

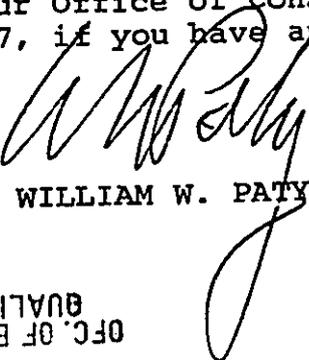
TO: The Honorable Marvin T. Miura, Director
Office of Environmental Quality Control

FROM: William W. Paty, Chairperson
Board of Land and Natural Resources

SUBJECT: DOCUMENT FOR PUBLICATION IN THE OEQC BULLETIN -
ENVIRONMENTAL ASSESSMENT FOR CONSERVATION DISTRICT USE
APPLICATION OA-4/4/90-2363 for Shoreline Protection,
Waialae, Oahu, TMK 1-3-5-23: 3 and 38

The above mentioned Chapter 343 Document was reviewed and a negative declaration was declared based upon the environmental assessment provided with the CDUA.

Please call me or Ed Henry of our Office of Conservation and Environmental Affairs, at 8-7837, if you have any questions.


WILLIAM W. PATY

Enclosure

OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

90 MAY -9 P2:01

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1990-05-23-OA-FEA

FILE COPY

ENVIRONMENTAL ASSESSMENT

FOR

*WAIALAE COUNTRY CLUB

SHORELINE PROTECTION*

FEBRUARY 1990

Environmental Assessment
Chapter 343, HRS

I SUMMARY

Action: Conservation District Use Application

Approving Agency: Department of Land and
Natural Resources, State of Hawaii

Request: The applicant request approval to construct a shoreline
revetment which lies within the Conservation District
seaward of the certified shoreline. This revetment is
intended to minimize shoreline erosion currently
impacting the project area.

Project Location: The project site is located at Waialae, Kahala, fronting
the two (2) parcel shore fronts occupied by the Waialae
Country Club (TMK:3-5-23:3 and 38). The project site is
bounded by the Waialae Beach Park to the southwest
and the Kahala Beach Apartments to the northeast.

Proposed Action: The proposed method for maintaining the beach area
at the project site is construction of a sloping rock
revetment of approximately 460 linear feet. The
revetment is designed with a two-stone thick armor
layer of 300-500 pound stones placed on a 1V:1.5 H
slope. The crest elevation is +6.0 feet MSL, which will
not sustain significant over-topping during typical
wave conditions, but which will be overtopped during
storm conditions. The crest of the structure would be
placed at the approximate location of the existing
escarpment

Tax Map Key: 1-3-5-23:3 and 38

State Land Use: Conservation

Applicant: Waialae Country Club
4997 Kahala Avenue
Honolulu, Hawaii 96816

**Environmental
Consultants:** Environmental Communications, Inc.
P.O. Box 536
Honolulu, Hawaii 96809

II PROJECT DESCRIPTION AND STATEMENT OF OBJECTIVES

A. Project Location

The project site is located at Waialae, Kahala, fronting the two (2) parcel shore fronts occupied by the Waialae Country Club (TMK:3-5-23:3 and 38). The project site is bounded by the Waialae Beach Park to the southwest and the Kahala Beach Apartments to the northeast, (Figure 1).

B. Statement of Objectives

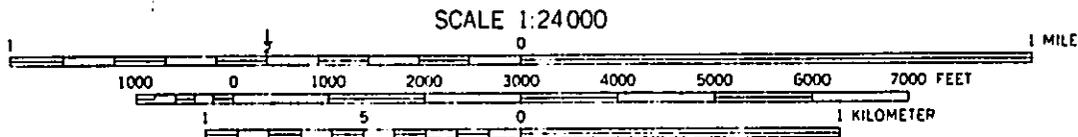
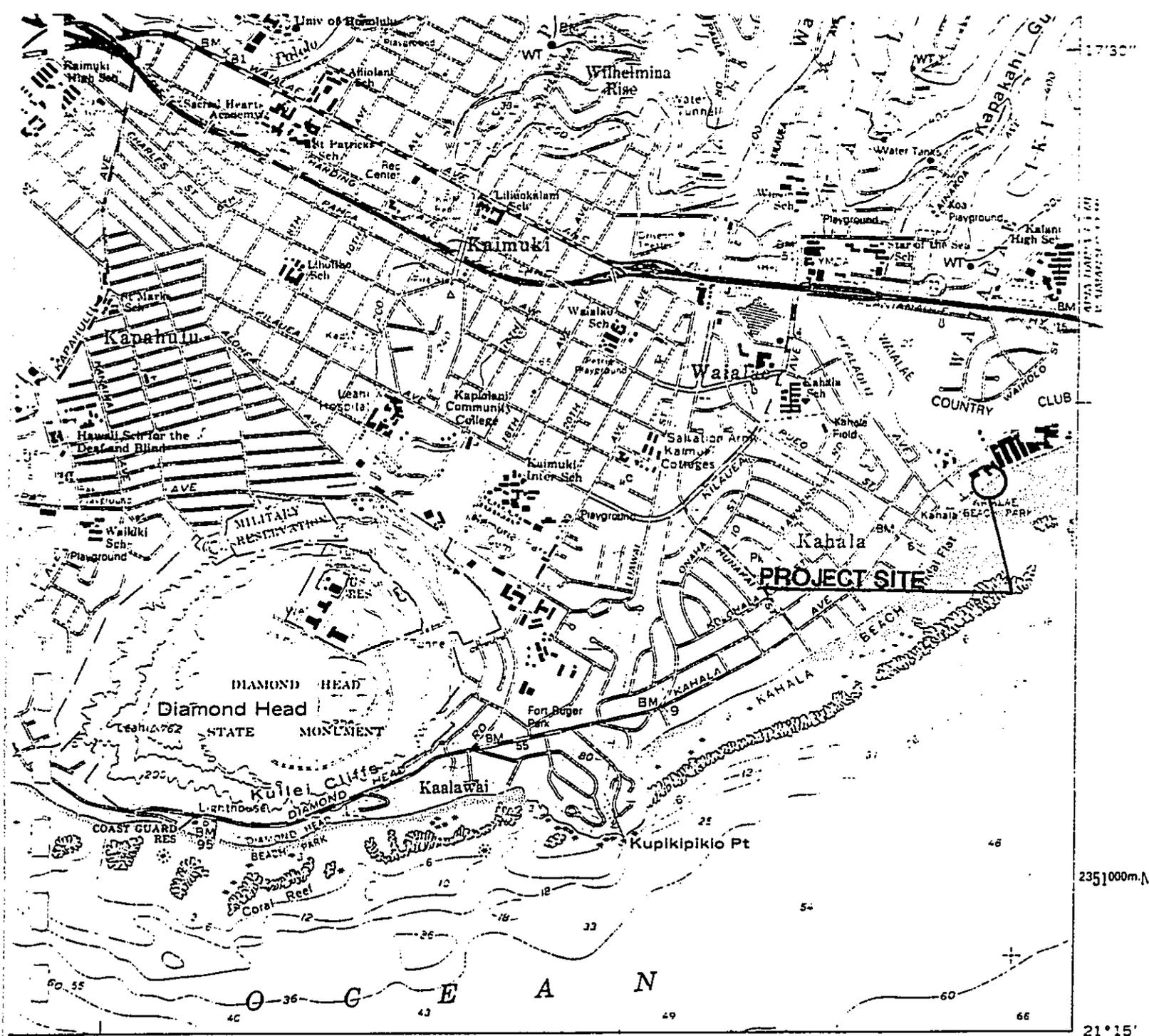
The project site, which is located on the shoreline fronting the Waialae Country Club, is a narrow beach that has been created with dredged coral fill material. A shallow tidal reef flat extends seaward of the shore. The site is exposed to summer southern swell waves and easterly tradewind waves that diffract around Koko Head. While the site is somewhat sheltered from large deepwater waves by the fringing reef and wide shallow reef flat, persistent exposure to the small reformed waves over the reef flat has resulted in erosion of the beach. The cementitious nature of the dredged coral fill on the beach helps to retard the rate of erosion. However, an escarpment and exposure of coral rubble in the swash zone is evidence of the ongoing erosion. Rock riprap protects the shore fronting the Kahala Beach Apartments adjacent to the project site. The Waialae Country Club desires to construct shore protection to prevent further erosion damage to the existing unprotected beach fronting their two parcels.

The existing beach area seaward of the Waialae Country Club property line has been created by filling with dredged coral material. As such, the proposed shore protection, which is intended to protect the existing beach area, will be seaward of the Waialae Country Club property line as well as seaward of the existing vegetation line. Thus, protection of the existing beach area will require construction of shore protection on State Conservation lands. This environmental assessment which is based on a coastal engineering evaluation by Edward K. Noda and Associates, Inc., is prepared in support of an application for a Conservation District Use Permit from the State Department of Land and Natural Resources (DLNR), in accordance with their Administrative Rules, Title 13, Chapter 2, for construction of shore protection in a Conservation District.

C. Land Tenure

The project site consists of State of Hawaii owned lands located adjacent to lands leased from the Estate of Bernice Pauahi Bishop.

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CONTOUR INTERVAL 40 FEET
DOTTED LINES REPRESENT 10-FOOT CONTOURS
DATUM IS MEAN SEA LEVEL
DEPTH CURVES AND SOUNDINGS IN FEET—DATUM IS MEAN LOW WATER

FIGURE 1. LOCATION MAP

D. Project Description

1. Technical Characteristics

The recommended method for maintaining the beach area at the project site is construction of a sloping rock revetment. Figure 2 shows a sketch of the typical sections, and Figure 3 shows the plan view of the proposed revetment. The revetment layout is superimposed on a portion of the shoreline and topographic survey of the parcels prepared by Engineers Surveyors Hawaii, Inc.

The revetment is designed with a two-stone thick armor layer of 300-500 pound stones (nominal stone diameter 1.4 feet) placed on a 1V:1.5H slope. The armor layer is underlain with a 1-foot thick underlayer of spalls to 8 inch stone, which is placed on a prepared supporting slope. The toe of the revetment should be excavated in order to place the revetment footing directly on the existing limestone reef platform. The excavated materials will be screened and the sand sized particles will be replaced on the existing beach backshore to restore eroded areas and to cover the existing exposed coral rubble fill material. The remaining large coral rubble pieces can be used for the revetment foundation and underlayer.

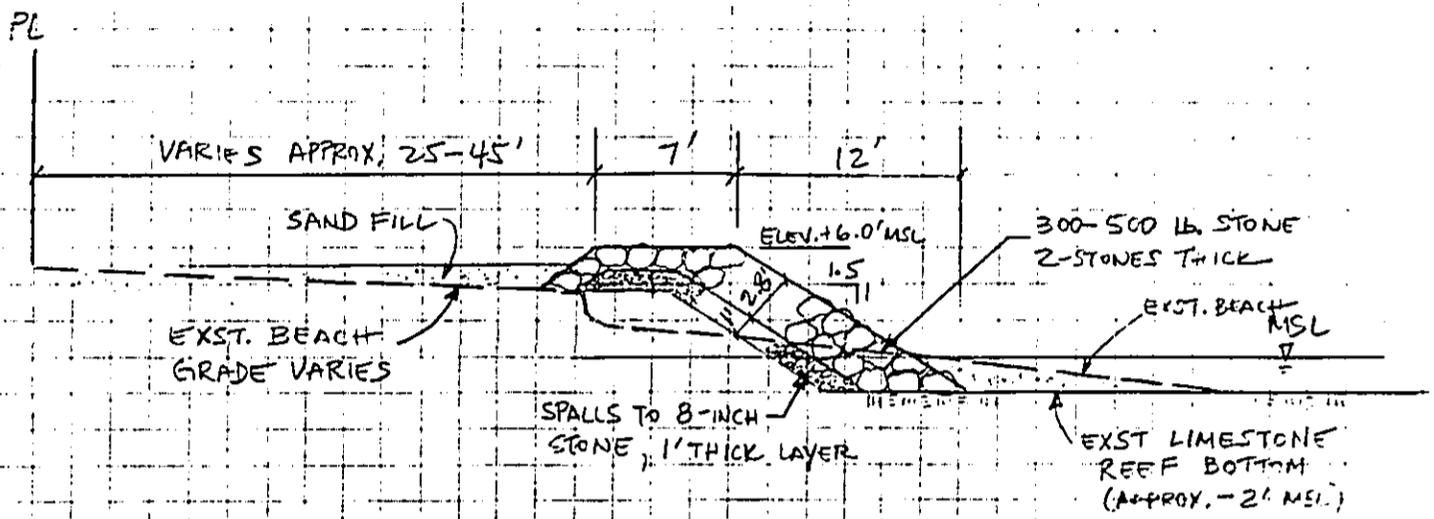
The crest elevation is +6.0 feet MSL, which will not sustain significant overtopping during typical wave conditions, but which will be overtopped during storm conditions. The underlayer and armor layer are extended at the revetment crest to prevent potential damage to the revetment due to the overtopping water. In contrast, the existing riprap slope on the shorefront adjacent to the project site shows evidence of overtopping damage due to the low crest elevation (+5' MSL) and inadequate design for overtopping.

The total volume of rock required for the revetment is about 2.0 cubic yards (c.y.) per linear foot. Of this total volume of rock, less than 1.0 c.y. per linear foot extends below the MHW line.

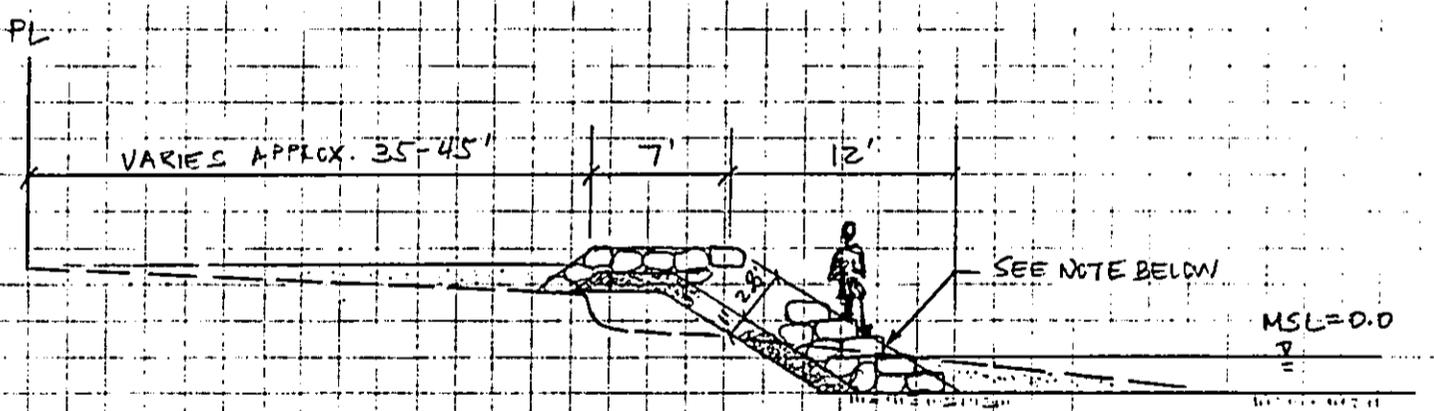
The proposed revetment extends about 460 linear feet along the project shoreline. The crest of the structure would be placed at the approximate location of the existing escarpment (designated "Top Slope" on the shoreline survey).

2. Environmental Characteristics

The intent of the revetment is to prevent further loss of dry beach area within the project site. The backshore dry beach area is presently used by sunbathers and for lateral public access, while the beach foreshore



TYPICAL REVETMENT SECTION

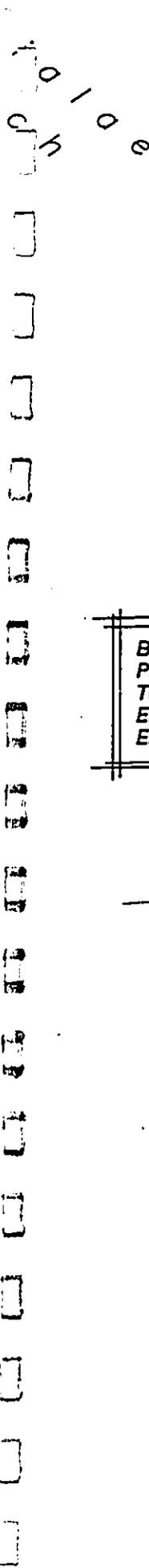


TYPICAL SECTION AT STAIRS

NOTE: USE FLATTENED STONES OR CONCRETE BLOCKS IN OUTER LAYER FOR STEPS. DO NOT CAST IN PLACE OR GROUT.

FIGURE 2. PROPOSED REVETMENT TYPICAL SECTIONS

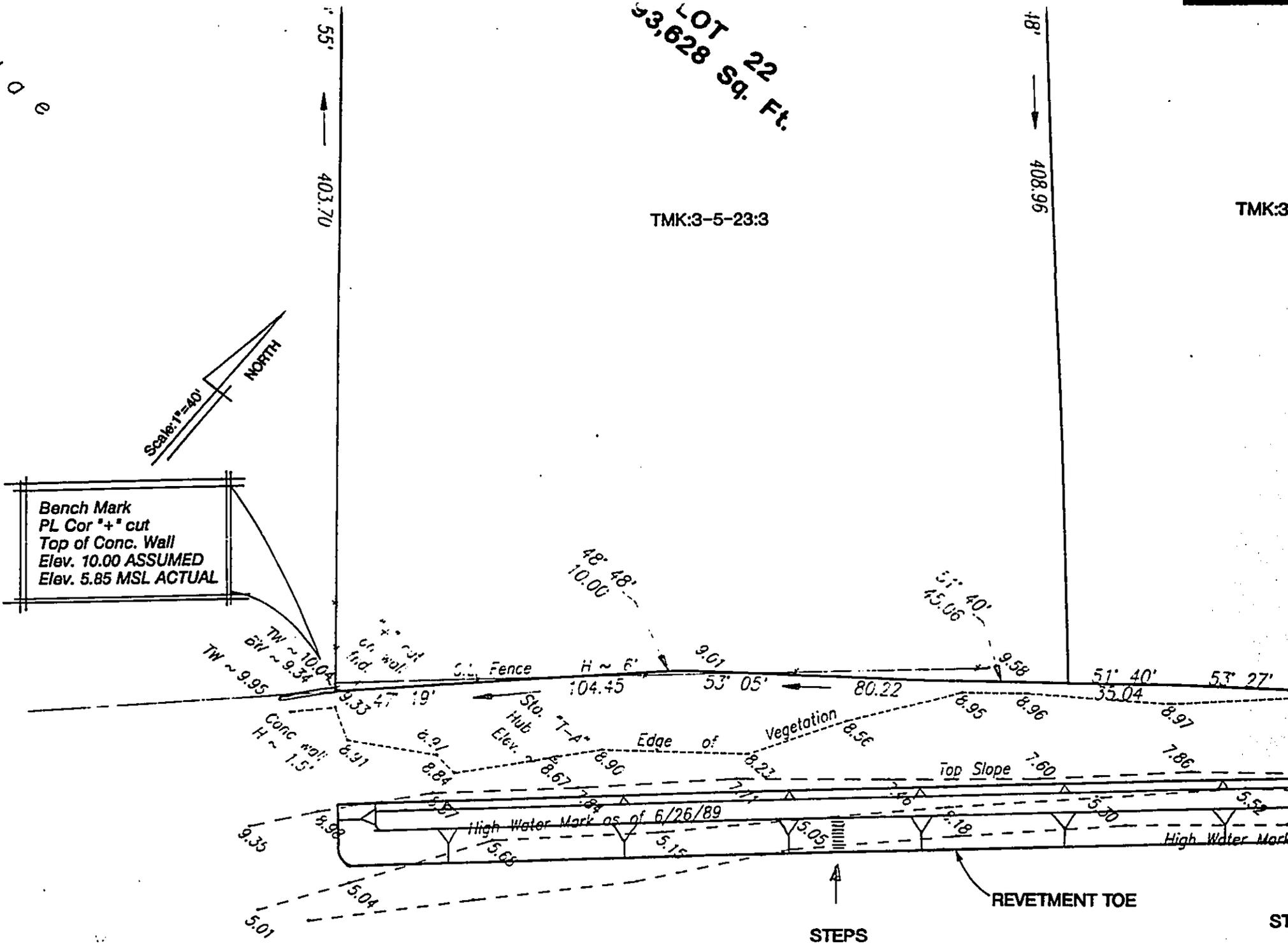
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LOT 22
93,628 Sq. Ft.

TMK:3-5-23:3

TMK:3



NOTES:

1. Shoreline and Topographic Survey by Engineers Surveyors Hawaii, Inc. June 26, 1989.
2. All elevations based on assumed elev. of Bench Mark. Subtract 4.15' to obtain actual elevations referenced to MSL Datum.

Pacific

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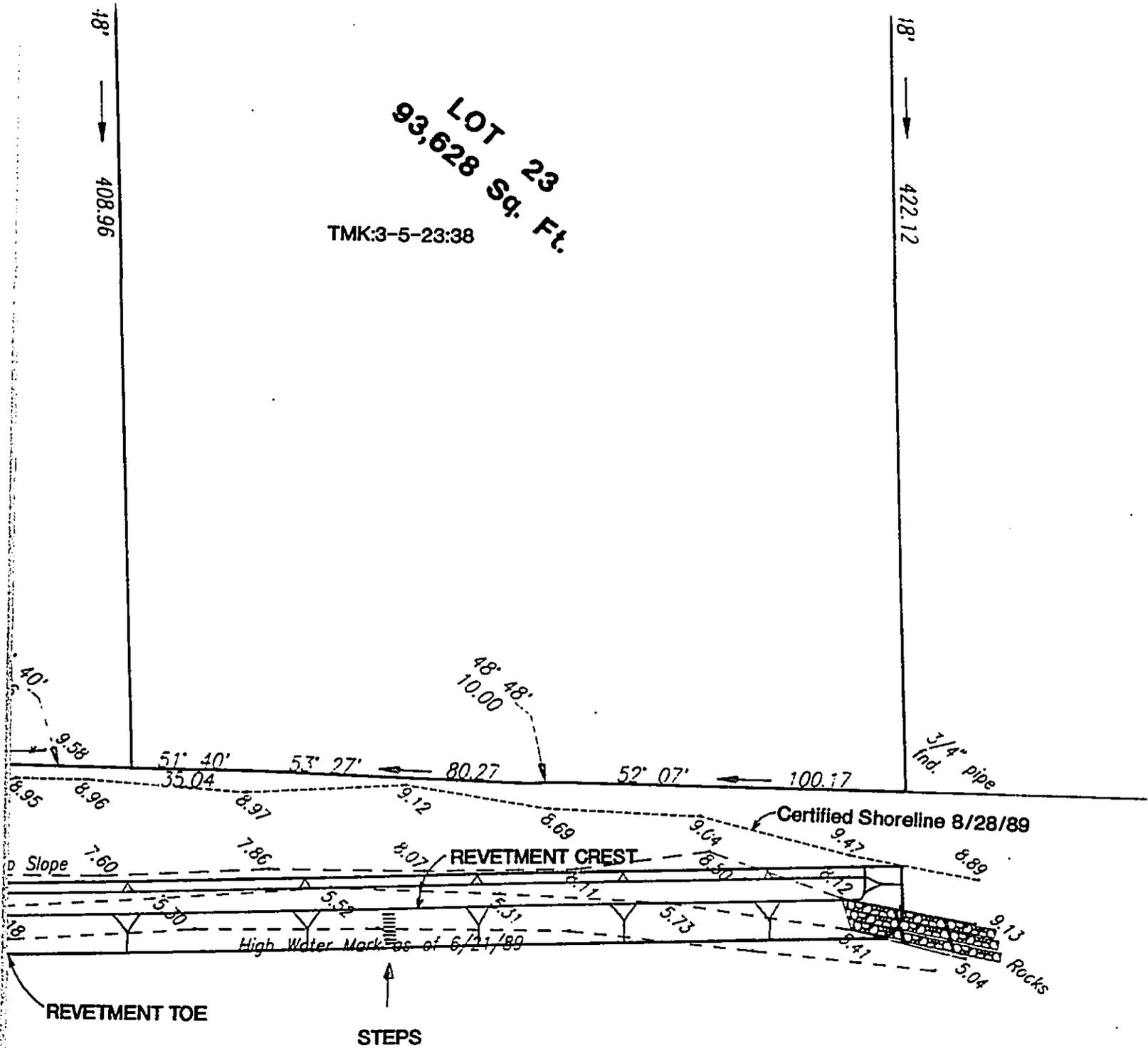


FIGURE 3. PROPOSED LAYOUT PLAN FOR REVETMENT

f i c *O c e a n*

(land-sea interface) is rarely traversed because of the unpleasant rocky beach slope. The result of the revetment construction would be the creation of a type of "perched beach". The revetment would protect the beach area from typical wave attack, and would be low enough such as to not create a visual barrier from the beach. As such, wave overtopping and inundation of backshore areas due to extreme storms could occur. The revetment is not intended to provide complete protection from storm wave overtopping, although it is designed to remain stable under storm wave attack. In contrast, the riprap slope on the adjacent shore is not designed to remain stable under storm wave attack, as the small rocks can be moved by the expected storm waves, and overtopping and leaching of foundation materials through the loose riprap slope can lead to scouring and slumping of the rock slope.

Access to the water across the revetment slope is expected to be more easily accomplished than traversing the existing adjacent riprap slope. The revetment armor stones will be larger and more uniformly placed on the slope, in contrast to the loosely dumped riprap stones. To further enhance access to the water, it is proposed that "steps" be built into the revetment slope at the midway point along the reach. The steps would not be a rigid concrete stairway, but rather would be fashioned of individual "blocks" used in place of the quarried armor stones, preferably natural basalt flattened stones or concrete blocks. The flattened surfaces of the individual armor units, when placed in the revetment slope, would provide natural "steps" down to the water. This approach maintains the flexibility of the revetment structure and is consistent with the design intent.

E. Phasing

The work is to take place in one phase and is scheduled to take approximately 45 calendar days to complete.

F. Funding

Total estimated costs for the project is approximately \$125,00.00 and will be at the expense of Waialae Country Club. There are no State or County funds involved.

III. AFFECTED ENVIRONMENT

A. Geographical Characteristics

The Waialae-Kahala coastal reach is fronted by a shallow tidal reef flat with water depth typically less than 2 feet extending approximately 1,000 feet offshore. A fringing coral reef is nearly continuous along the seaward edge of the reef flat. The shallow reef flat fronting the Kahala Hilton Hotel has been dredged for recreational purposes, including construction of an offshore "island" (Photo 1). A dredged "channel" extends parallel to shore from the Hilton to the vicinity of the Waialae Beach Park drainage channel outlet to the sea. The beach fronting the Kahala Beach Apartments, from the Kahala Hilton Hotel to the Waialae Country Club, is protected with riprap (photos 1 and 2). The beach fronting the Waialae Country Club and adjacent Waialae Beach Park is unprotected (Photos 3 and 4).

The backshore beach elevation is at approximately 5 feet above MSL. The land-sea interface fronting the Waialae Country Club is characterized by a sharp, ragged escarpment. Because of the nature of the dredged coral fill material on the beach, the seaward escarpment is somewhat cemented. The winnowing action of waves on the shore has also exposed coral rubble chunks in the swash zone, making access to the water unpleasant and even hazardous in areas where sharp coral rubble below the waterline can hurt the unwary beachgoer.

The beach fronting the Waialae Beach Park is in better condition and more conducive to beach recreation (Photos 5 and 6). Because the drainage channel outlet requires periodic maintenance clearing of sand deposits, the sand is replaced on the adjacent beaches with a dozer (Photos 7 and 8). Periodic beach nourishment of the Waialae Beach Park shorefront, from maintenance clearing of sand from the drainage channel, has maintained this beach area for recreational use.

B. Coastal Processes

The wave climate along the project reach is relatively mild because of the protection afforded by the shallow fringing reef and tidal reef flat. Large deepwater waves initially break on the reef edge, and what energy remains propagates to the shoreline as reformed waves which break at the shore. Typical nearshore wave heights are 1 foot or less, with typical maximum wave heights less than 2 feet. Maximum storm waves which can attack the shoreline are limited by the nearshore water depth. Maximum breaking wave height at the shoreline during storm conditions is estimated to be 3.3 feet at the project site.



Photo 1. View NE towards Kahala Hilton Hotel. Exst riprap fronts the Kahala Beach Apts.



Photo 2. Exst riprap protection fronting the Kahala Beach Apts.

Photo Date 7/14/88, tide approx. +0.2' MSL



Photo 3. View SW along Waialae Country Club shorefront.



Photo 4. View towards Waialae Beach Park from SW portion of project shorefront.

Photo Date 7/14/88, tide approx. +0.2' MSL



Photo 5. View NE along Waialae Beach
Park shorefront.



Photo 6. View offshore Waialae Beach
Park (sheetpile groin borders north side
of drainage channel).

Photo Date 7/14/88, tide approx. +0.2' MSL



Photo 7. View across drainage channel mouth (during maintenance clearing of sand from the channel).

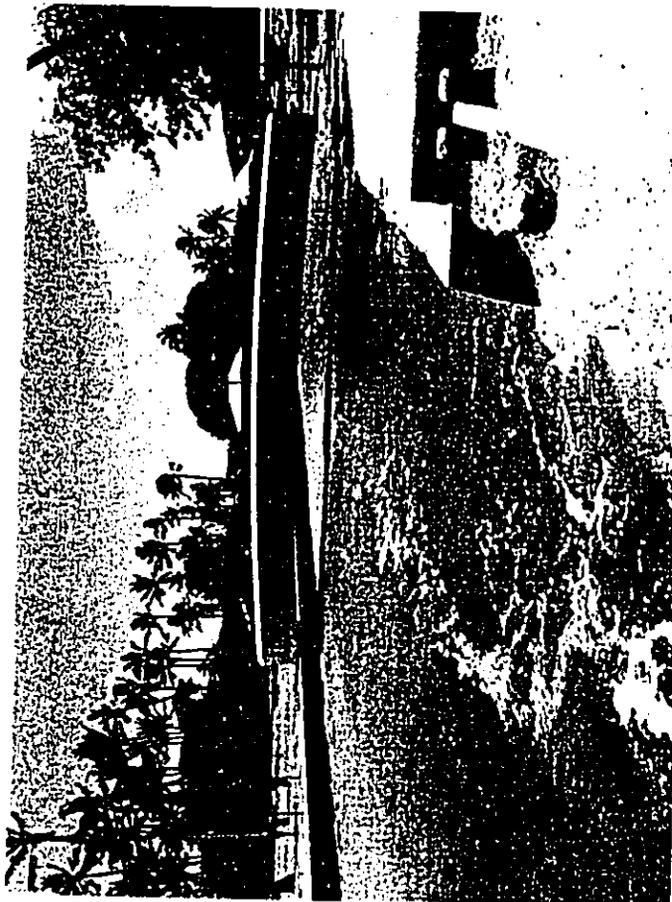


Photo 8. View upstream of the drainage channel.

Photo Date 7/14/88, tide approx. +0.2' MSL

For the project site, longshore transport is estimated to be southwestward during typical easterly tradewind wave conditions. Because of the lack of sand on the shoreline northeast of the site and the existing dredged channel across the reef fronting the site, there is little or no sand transport from updrift shoreline and nearshore reef areas into the project site. Therefore, under these conditions, net erosion of the beach at the project site occurs.

During south-southwesterly swell conditions, longshore transport is estimated to be northeastward at the project site. Because of the sheet pile groin at the Waialae Beach Park drainage channel, there is little or no sand transport from updrift shoreline areas southwest of the drainage channel. Therefore, under these conditions, net erosion of the beach area northeast of the channel occurs.

The beach area fronting Waialae Beach Park is more stable than the adjacent Waialae Country Club frontage because of the stabilizing effect of the drainage channel groin during easterly tradewind wave conditions, where sediments eroded from the project site are partially trapped by the groin and accumulate in the front of the Beach Park. Periodic maintenance clearing of sand from the drainage channel and replacement on the adjacent beach restores any net loss of sediments eroded from the beach park shoreline due to south-southwesterly swell conditions. However, sand is not replaced on shoreline areas beyond the beach park frontage.

IV. SUMMARY OF MAJOR IMPACTS AND ALTERNATIVES CONSIDERED

A. Summary Of Impacts

The revetment would have no adverse effect on the existing coastal processes. The revetment would extend from the existing riprap protection southwestward along the shoreline fronting the Waialae Country Club parcels. The adjacent beach area fronting the Waialae Beach Park would not be affected by the revetment. This beach area is stabilized by the sheet pile groin at the drainage channel and the periodic beach nourishment from maintenance clearing of sand from the drainage channel.

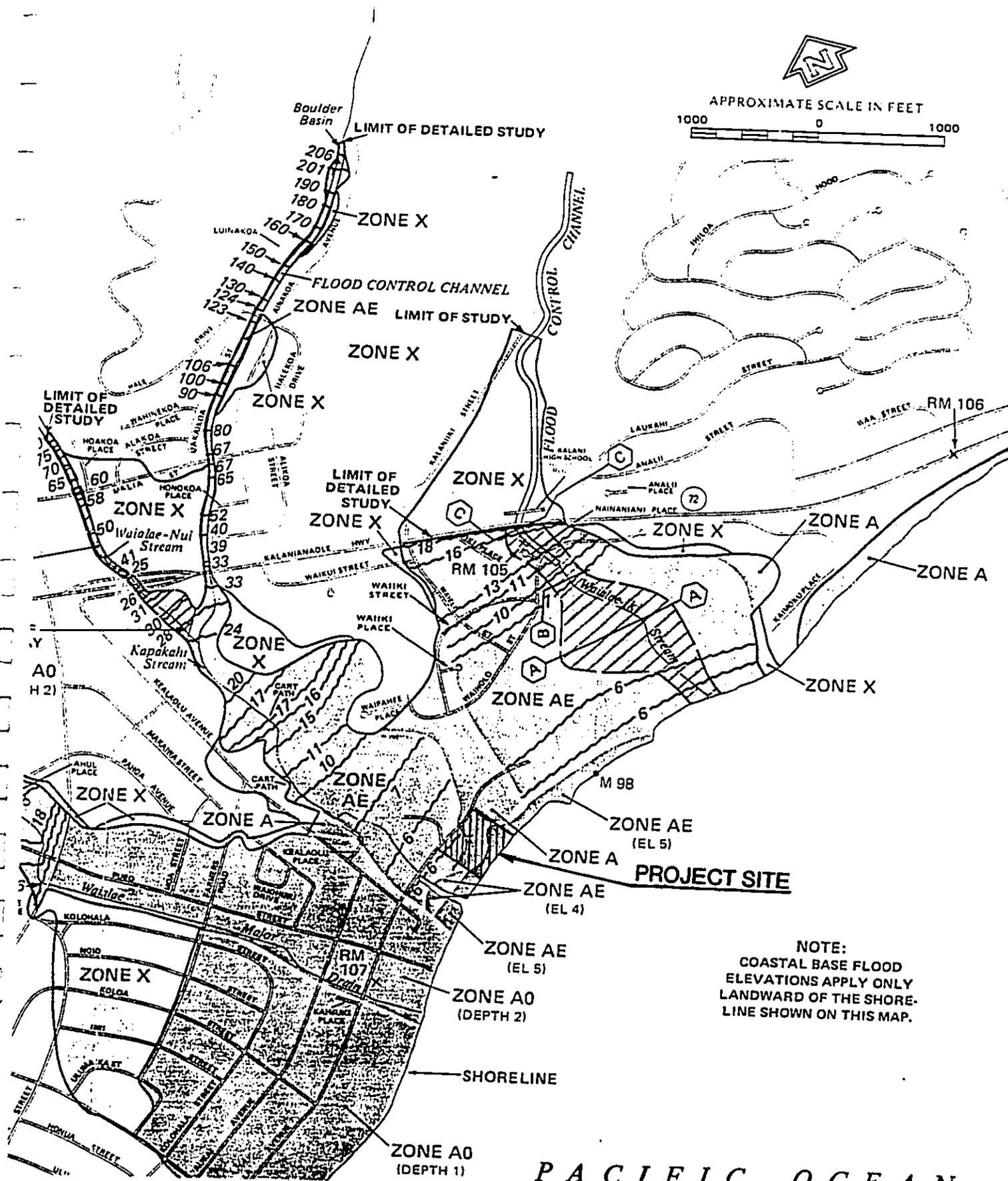
The construction activities will result in short-term noise and traffic impacts to the area due to trucks and equipment working on site. There will be temporary increased turbidity during construction since the revetment will require excavation below MSL elevation. However, the water quality impacts will be no greater than the impacts during maintenance clearing of sand from the drainage channel.

The proposed revetment will have no long-term adverse effects on the offshore area. The shallow reef flat has been disturbed by previous dredging and construction activities. In addition, the revetment would mitigate turbidity impacts due to existing erosion of the dredged coral-filled beach area, thus resulting in long-term positive effects on offshore aquatic resources.

The subject shoreline area is located within a coastal flood hazard zone designated Zone AE (base flood elevation 5 feet on the Federal Flood Insurance Rate Map (FIRM), as indicated in Figure 4. The shore protection construction may have a mitigating effect on the flood characteristics since the revetment crest elevation is 1 foot higher than the base flood elevation.

There are no known rare, threatened, or endangered species nor their habitats located in or near the project site.

Waialae Country Club will be responsible for the maintenance and upkeep of the proposed revetment improvement, and further, will hold the State harmless for liabilities that could result from the implementation of this improvements. Finally, public access will not be restricted as a result of this proposed improvement.



NOTE:
 COASTAL BASE FLOOD
 ELEVATIONS APPLY ONLY
 LANDWARD OF THE SHORE-
 LINE SHOWN ON THIS MAP.

PACIFIC OCEAN
 FIGURE 4. PORTION OF FEMA FLOOD INSURANCE RATE MAP (FIRM).
 PANEL NO. 150001 0120C, REVISED SEP 4, 1987.

B. Alternatives Considered

1. No Action Alternative

Taking no action is not a viable alternative, since the beach area is likely to continue to erode in the long-term. Continued erosion will reduce public access and recreational use of the beach area.

2. Beach Nourishment

Beach nourishment involves the placement of sufficient quantities of sand to create a wide sloping beach which can dissipate the wave energy and serve as a reservoir to longshore transport. Periodic nourishment will likely be required to maintain the desired beach width since net long-term loss of sediments from the project site is the apparent trend. It is a costly alternative if sand must be trucked to the site from existing commercial sources. A logical source of the sand for beach nourishment is from the periodic maintenance clearing of sand from the drainage channel. During southwesterly longshore transport, some of the sediments from the project site and adjacent beach park shoreline may bypass the groin and be deposited in the drainage channel due to overtopping of the low-elevation sheet pile structure. Therefore, replacement of sand on the adjacent beaches from the maintenance clearing of the drainage channel should logically include nourishment of the beach area fronting the Waialae Country Club. However, because of jurisdictional considerations between the City and County, State, and the private property owners, this beach nourishment alternative for the project site may not be viable.

3. Revetment Alternative

In lieu of periodic beach nourishment, the most viable alternative for protecting the shoreline area from continued erosion is the construction of a revetment. Revetments are sloping structures typically constructed using rock of sufficient size to remain stable under design wave attack. Seawalls are another alternative for protecting shorelines from wave attack, but are less desirable than revetment construction for the project site for the following reasons:

- A near-vertical seawall would impair accessibility to the water from the beach area.
- A seawall would necessarily have to be built high enough to preclude significant overtopping of waves, since major overtopping could impair the structural stability of the seawall due to scouring and leaching of backshore materials. Thus, a

seawall would likely impact seaward views from the beach area, since the seawall crest elevation would be substantially higher than the beach crest elevation.

- If a determination is made to nourish the beach along the project shoreline in the future, a revetment is more conducive to maintaining a fronting beach than a seawall. The high reflectivity of a seawall would likely increase the rate of erosion due to scouring of the sand in front of the structure, compared to the greater energy absorbing characteristics of a sloping rock revetment.

4. Offshore Breakwater Alternative

Offshore breakwater structures would also be effective in protecting the beachfront. However, because of the recreational use of the nearshore waters by catamarans and windsurfers, offshore structures would likely not be acceptable to the public.

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
850 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523 4432

FRANK F. FASI
MAYOR



JOHN P. WHALEN
DIRECTOR
BENJAMIN B. LEE
DEPUTY DIRECTOR
LU12/89-7955(RF)

December 21, 1989

Mr. Allan S. U. Lum,
General Manager
Waialae Country Club
4997 Kahala Avenue
Honolulu, Hawaii 96816

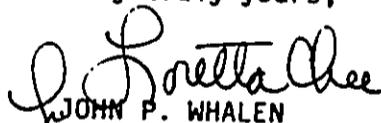
Dear Mr. Lum:

Proposed Rock Revetment
Waialae Country Club
Tax Map Key 3-5-23: 03, 38

We have reviewed the plan submitted with your December 11, 1989 letter. The plan shows the proposed rock revetment to be entirely seaward of the certified shoreline. On this basis, the project lies entirely outside the Special Management Area (SMA) and the shoreline setback.

If you have any questions, please contact Mr. Robin Foster of our staff at 527-5027.

Very truly yours,


JOHN P. WHALEN
Director of Land Utilization

JPW:s1
0293N/30

cc: DLNR