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July 6, 2001

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

Dear Ms. Salmonson:

Subject: Finding of No Significant Impact (FONSI) for the Mauna Lahilahi Beach Protection Project, Tax Map Key 8-5-17: 5 (and portions of parcels 4, 6, and 7)

The City and County of Honolulu, Department of Design and Construction (DDC), has reviewed the comments received during the 30-day public comment period which ended on September 7, 2000. The DDC has determined that this project will not have significant environmental impacts and has issued a FONSI. Please publish this notice in the July 23, 2001 OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form and four copies of the final environmental assessment.

Please call Mr. Donald Griffin at 527-6324 if you have any questions.

Very truly yours,

RAE M. LOUI, P. E.
Director

RML:ei

Enclosures

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2001-07-23-OA-FEA-

FINAL ENVIRONMENTAL ASSESSMENT FOR PROPOSED SHORE PROTECTION AT MAUNA LAHILAHI BEACH PARK

Prepared for:

The City and County of Honolulu
Department of Design and Construction

July 2001

1001 BISHOP STREET • PACIFIC TOWER • SUITE 2970 • HONOLULU, HAWAII 96813
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EXECUTIVE SUMMARY

Mauna Lahilahi Beach Park is located on the leeward side of Oahu between Lahilahi Point and Waianae High School. A small pocket beach located at the southeast end of the park fronts the Makaha Surfside Apartments (TMK: 8-5-17).

The shoreline park land fronting the Makaha Surfside has undergone severe coastal erosion. The shoreline within the project area has receded over 60 feet since 1972. Several trees have been lost to erosion, and the vegetation line continues to recede. An access easement that formerly ran along the *mauka* edge of the park property has also been entirely lost to erosion. An estimated 35,000 square feet of City & County park land valued at $750,000 has already been lost to shoreline erosion. Hurricanes Iwa and Iniki caused over $2 million in damage to the Makaha Surfside Apartments. The City and County of Honolulu, Department of Design and Construction (DDC), contracted Oceanit Laboratories, Inc. (Oceanit) to develop a *long-term* erosion control scheme to protect the park land and to improve the recreational value of the beach by adding clean sand.

This project proposes to construct a shore-connected breakwater at the approximate location of the previous shoreline and to nourish the beach with the placement of 5,000 cubic yards of suitable sand.

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I. GENERAL INFORMATION

Applicant:	City and County of Honolulu Department of Design and Construction 650 South King Street Honolulu, Hawaii 96813
Consultant:	Oceanit Laboratories, Inc. 1001 Bishop Street Suite 2970, Pacific Tower Honolulu, Hawaii 96813
Landowner:	State of Hawaii Department of Land and Natural Resources. Park land managed by Department of Parks and Recreation, City and County of Honolulu under Executive Order 3452.
Accepting Agency:	City and County of Honolulu. *Department of Design and Construction.*
Project Location:	Waianae, Oahu, Hawaii.
Proposed Action:	Nourishment of the beach with approximately 5,000 cubic yards of sand and construction of a shore-connected breakwater to reduce shoreline erosion of Mauna Lahilahi Beach Park fronting the Makaha Surfside Apartments.
Tax Map Key:	8-5-17:5 (and portions of parcels 4, 6, and 7).
Land Area:	Approximately 8,000 square feet from the certified shoreline to the Makaha Surfside property line.
State Land Use District:	Conservation (for submerged lands).
Conservation Subzone:	Resource (see Conservation District Use Map – Appendix A).
County Development Plan:	Designation of *Park* along shoreline area (see TMK/Development Plan Map – Appendix A). No designation for submerged lands.
Zoning:	*P-2* (Preservation General) along shoreline. No designation for submerged lands.
Existing Use:	Public beach park.
Proposed Use:	Public beach park with offshore breakwater and beach nourishment.
Anticipated Determination:	Finding of No Significant Impact (FONSI).
Trigger(s):	Use of County Land or Funds, Use of Conservation Lands, Use of Shoreline Setback Area/ SMA.
Estimated Cost:	$800,000 (construction).
Time Frame:	Construction is scheduled to begin when permits are granted and a construction contract is awarded and will require at least two weeks.

Unresolved Issues:	Source of Sand Source of Rock
Consulted Agencies:	<u>Federal</u> ▪ Department of the Army - Pacific Ocean Division ▪ United States Fish and Wildlife Service ▪ United States National Marine Fisheries Service ▪ United States Environmental Protection Agency <u>State Agencies</u> ▪ Department of Land & Natural Resources o Land Division o State Historic Preservations Office o Division of Aquatic Resources ▪ Department of Health o *Clean Water Branch* ▪ Department of Business, Economic Development, and Tourism o Coastal Zone Management Program <u>City and County of Honolulu</u> ▪ Department of Parks and Recreation ▪ Department of Planning and Permitting ▪ Department of Design and Construction
Consulted Individuals/ Groups:	Makaha Surfside Association of Apartment Owners (AOAO) Waianae Coast Neighborhood Board No. 24 Mr. Lucio Badayos Mr. Alika Silva Mr. Glen Kila Mr. Clarence De Lude

II. DESCRIPTION OF PROPOSED ACTION

A. *INTRODUCTION*

Mauna Lahilahi Beach Park is located on the leeward side of Oahu between Lahilahi Point and Waianae High School (see Figure 1). A small pocket beach located at the southeast end of the park fronts the Makaha Surfside Apartments (TMK: 8-5-17). Figure 2 shows an aerial photograph of the project area.

The shoreline park land fronting the Makaha Surfside has undergone severe coastal erosion. Since the early 1970's an estimated 35,000 square feet of City and County Park land has been lost to shoreline erosion (valued at an estimated $750,000). Hurricanes Iwa and Iniki caused nearly $2 million in damage to the Makaha Surfside Apartments. The City and County of Honolulu, Department of Design and Construction (DDC), contracted Oceanit Laboratories, Inc. (Oceanit) to develop a long-term erosion control scheme to protect the park land and to improve the recreational value of the beach by adding clean sand.

This project proposes to construct a shore-connected breakwater at the approximate location of the previous shoreline and to nourish the beach with 5,000 cubic yards of suitable sand.

1 Background and Description of Project Area

The land between the shoreline and the Makaha Surfside property line was placed under the control of the City and County of Honolulu Department of Parks and Recreation via State Executive Order 3452. The certified shoreline follows an embankment eroded into hard clay overlaying rock and boulders. The small cove fronting the Makaha Surfside shoreline is approximately 350 feet long and 250 feet wide. Water depth at the mouth of the cove is approximately 6 feet below Mean Sea Level (MSL).

The shoreline consists of a relatively flat limestone bench raised several feet above sea level. The shoreline substrate at the sides and bottom of the cove consists of relatively hard limestone covered with sand at the shoreline and rubble in the surge zone. The limestone consists primarily of consolidated calcareous sand. These formations are common on tropical shorelines where the pH difference between groundwater and seawater causes the calcareous sand grains to become welded together forming a dense "beach rock" limestone. In deeper areas, coral and algae growth cover the substrate. The sand cover on the beach is relatively thin, generally less than 2 feet. A layer of topsoil forms an escarpment at the top of the beach. Both flanking sides of the bay are steep rocky areas with little sand cover.

The shoreline within the project area has receded over 60 feet since 1972. Several trees have been lost to erosion, and the vegetation line continues to recede. An access easement that formerly ran along the *mauka* edge of the park property has also been entirely lost to erosion (see Certified Shoreline Map – Appendix A). Photos in Figure 3 document the progressive erosion over the years. By 1999, the top of the eroded bank was less than 10 feet from the Makaha Surfside property.

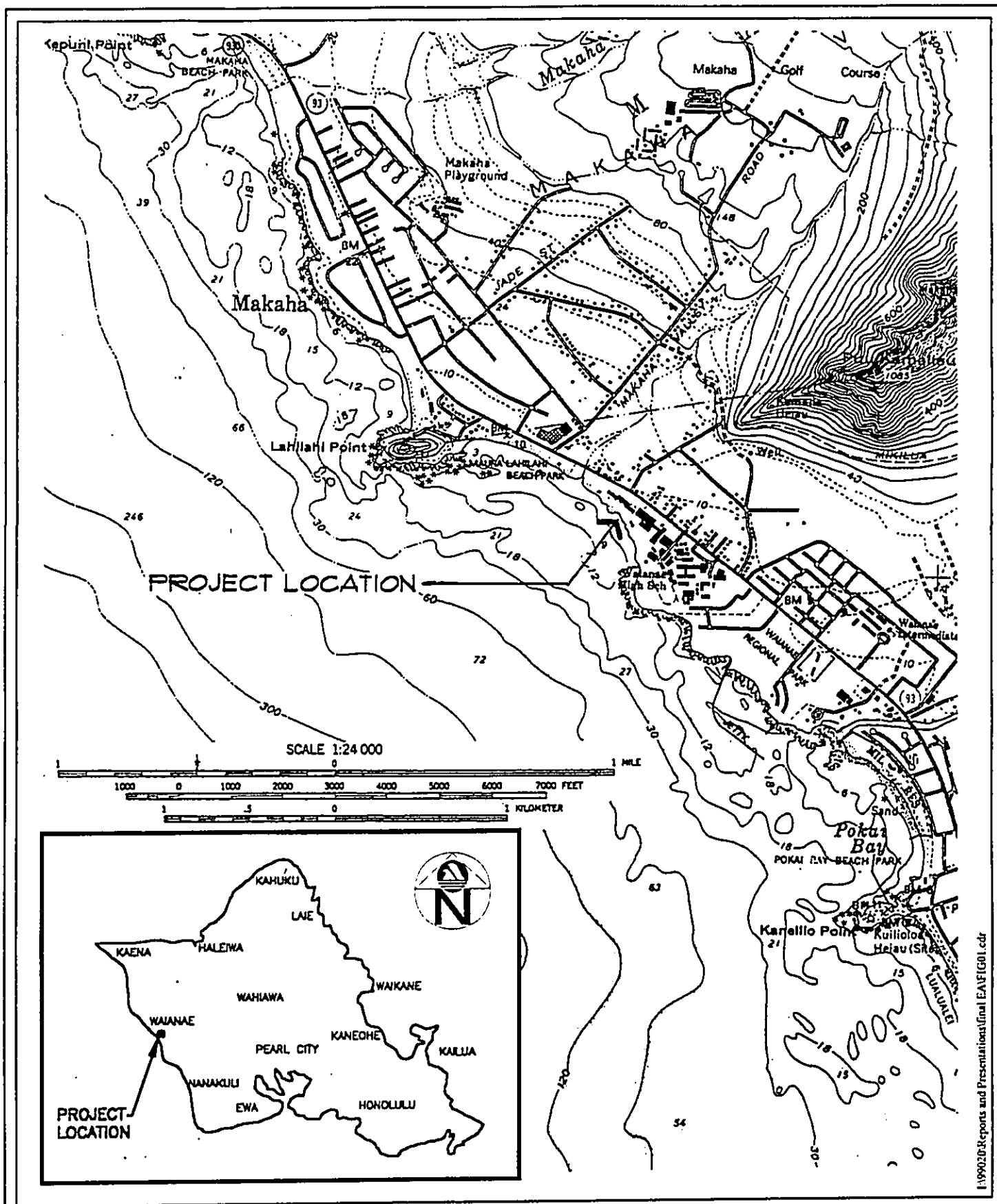

FIGURE 1. SITE LOCATION MAP

MAUNA LAHILAHI BEACH PARK

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FIGURE 2. AERIAL PHOTOGRAPH (JULY 12, 1994)

MAUNA LAHILAHI BEACH PARK

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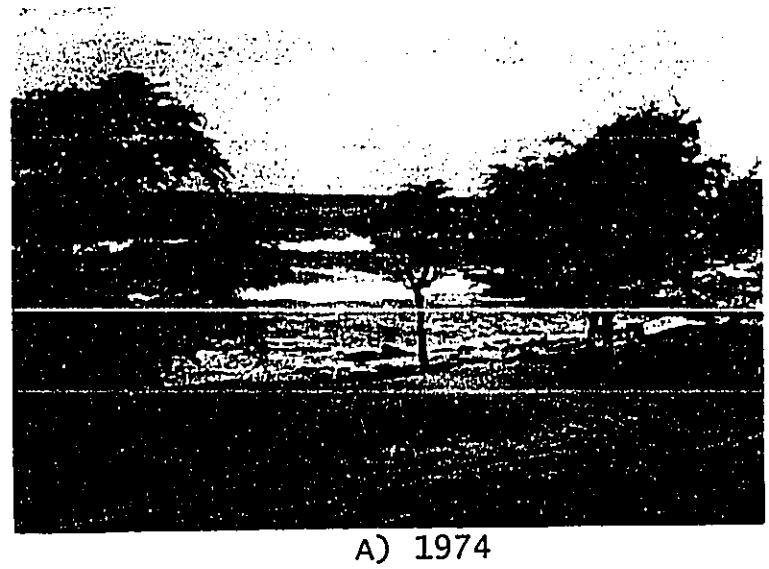
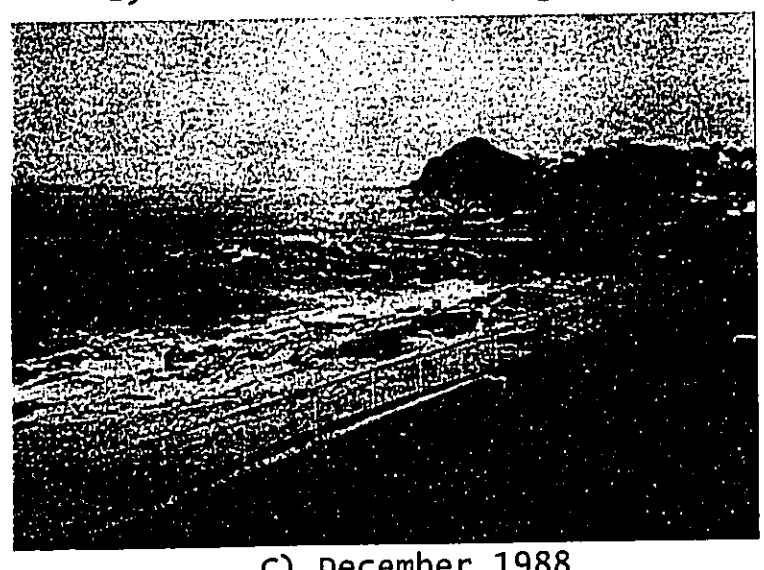


A) 1974

B) November 1982 (Damage from Iwa)



C) December 1988

I:\99020\Reports & Presentations\Final EA\FIG03.cdr

FIGURE 3. HISTORICAL SITE PHOTOS

MAUNA LAHILAHI BEACH PARK

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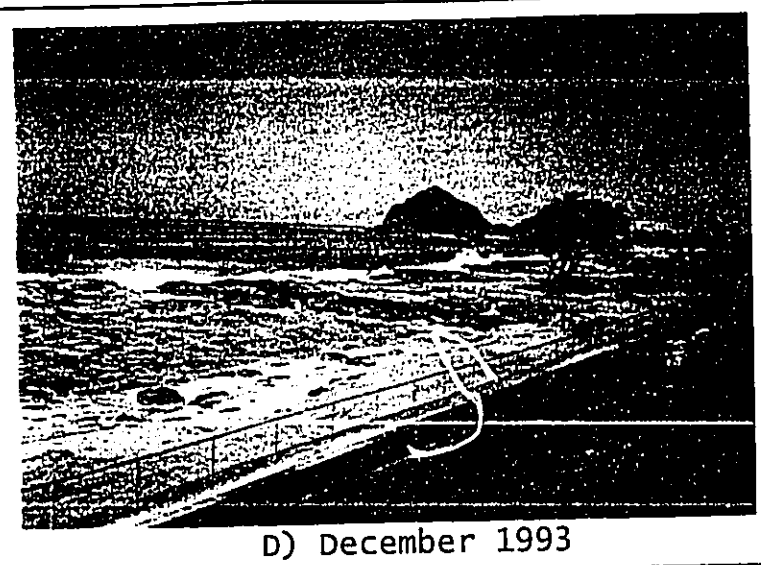
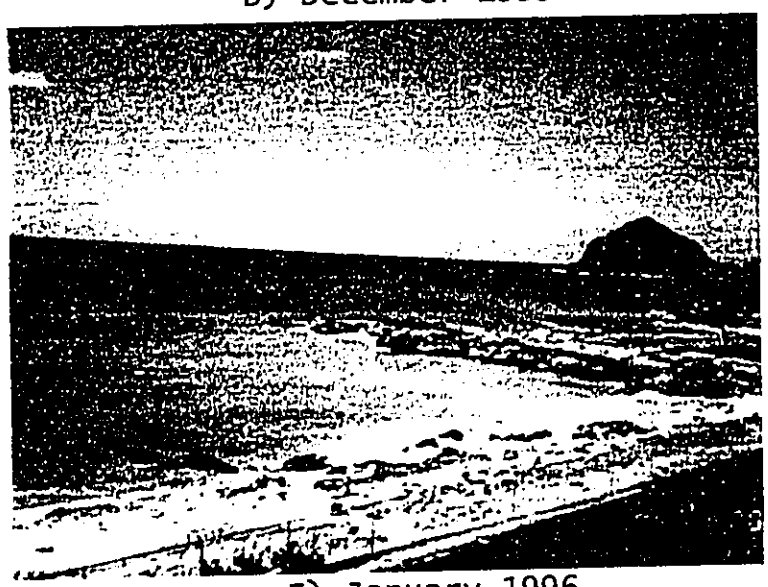


D) December 1993



E) January 1996

F) February 2000 (Sandbag Revetment)

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FIGURE 3. HISTORICAL SITE PHOTOS (continued)

MAUNA LAHILAHI BEACH PARK

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The accelerated erosion in the project area is probably caused by several factors. Residents believe that Hurricanes Iwa and Iniki made the situation worse, and measurements support their conclusions. Between 1949 and 1988, net erosion at Lahilahi Beach was approximately 9-12 feet - not nearly as much as in the cove (Sea Engineering, 1988). However, between 1977 and 1988, the beach north of the cove receded 31 feet. Most of this erosion probably resulted from Hurricane Iwa in 1982.

Studies referenced in the Final Environmental Impact Statement for Waianae Boat Harbor, Waianae, Oahu (Oceanic Institute, 1976) indicate that the area between Lahilahi Point and Kaneilio Point (south of Pokai Bay) probably comprises a littoral cell, a partially confined area where sand is created and circulates. Sand transport is primarily onshore/offshore. Outside the cove, sand transport is primarily northwest toward Mauna Lahilahi Beach but can move in either direction along the coast. Aerial photographs show numerous sand patches and channels in the reef indicating that sand from the beach may be in this area.

Erosion control has been addressed through both privately funded and City and County funded projects. In 1997, the Makaha Surfside Association of Apartment Owners (AOAO) received a permit to rebuild the beach by adding sand. After further consideration of cost, availability of sand, and technical difficulty, Oceanit recommended installation of a system to cut wave energy prior to placing nourishment sand. The City Council, through Councilman John DeSoto's initiative, budgeted funds for a two-phased approach. The first phase, funded at $120,000, was to install a temporary sandbag revetment to prevent further erosion. The revetment, constructed in 1999, consists of several layers of three-ton sandbags placed over a geotextile fabric filter between the beach and the top of the eroded embankment. Sand was backfilled to provide a safe walkway between the sandbags and the Makaha Surfside fence line. The sandbags worked well during periods of high waves in early 2000, but were not designed as a long-term erosion solution. Undermining and damage to the sandbag revetment was noted in July 2000, and repairs to the sandbags are necessary if they are to provide continued protection against erosion.

The second phase, addressed in this environmental assessment and funded at $190,000 for planning and design and $800,000 for construction, is to construct a permanent shore protection structure. The purpose of the structure is to reduce wave energy and shoreline erosion at the project site, as well as to reduce wave run-up and flooding of the inshore properties. After evaluating several alternatives (discussed in Chapter IV) Oceanit recommends constructing a shore-connected breakwater to reduce wave energy and rebuilding the beach by adding sand. The sandbags may be removed after the breakwater is completed and evaluated. The sand in the bags is suitable for beach nourishment.

2 Purpose of Document

The purpose of this environmental assessment (EA) is to provide information and analyses that help determine whether the impacts of the proposed action are significant enough to warrant the preparation of an Environmental Impact Statement (EIS). The EA has been prepared in compliance with the requirements of Chapter 343, Hawaii Revised Statutes (HRS) and the regulations adopted pursuant thereto.

3. Permit Requirements

Permits and approvals for the proposed action include:

- Department of the Army Corps of Engineers
  - ✓ Section 10/404
- State of Hawaii Department of Health
  - ✓ 401 Water Quality Certification
- Department of Business, Economic Development and Tourism, Office of Planning
  - ✓ Coastal Zone Management Federal Consistency
- Department of Land and Natural Resources
  - ✓ Conservation District Use Permit

B. DESIGN PARAMETERS

Design objectives for the breakwater are: 1) to reduce wave energy and resulting landward erosion; 2) to retain sand in a stable beach configuration; 3) to maintain adequate water circulation; and 4) to minimize impacts to the environment. Design parameters include wave height, period, and direction; currents and sediment transport; and structure size and location.

Mauna Lahilahi Beach Park is located on the leeward coast of Oahu where the beach is subject to waves from Kona storms, southern swells, and North Pacific swells. The site is exposed to waves from the WNW to the SSE (see Figure 4). Deep-water wave data within the exposure window were analyzed and the results are shown in Figure 5. Most frequent wave directions are from the south-southwest (southern swell) and from the northwest (north swell). The most frequent wave period is 12 to 14 seconds and the most frequent wave height is three feet.

Bottom contours offshore from the project site are fairly regular and are shown in Figure 4. As waves approach the shore they will encounter friction and refract (bend) as they enter progressively shallower water. Wave analysis indicates that waves from all directions within the site's exposure window align approximately with the shoreline (southwest) upon reaching the project site. Wave refraction patterns can be noted in the aerial photograph presented in Figure 2.

Water depth at the opening of the cove is approximately 6 feet at mean sea level (MSL). Design water level for the structure was determined to be 2.6 feet MSL [calculated by adding the highest anticipated tide (1.7 feet MSL), potential wave setup (0.5 feet), and predicted sea level rise over the 50 year design life of the structure (0.4 feet)]. These conditions were used to calculate a design wave height of 7 feet (the maximum non-breaking wave that would reach the structure).

The proposed breakwater is a rubble mound (stone) structure connected to the southern shoreline and extending almost parallel with the shoreline as shown in Figure 6. Breakwater dimensions and armor stone sizing were determined using methods in the Army Corps of Engineers Shore Protection Manual. The base of the breakwater will rest on a hard, consolidated bottom in approximately 6 feet (mean sea level) of water. Cross sections of the proposed breakwater are also shown in Figure 6. The breakwater crest is approximately 4 feet above mean sea level and has a width of approximately 10 feet. The face of the breakwater has a slope of 1:1.5 along the trunk and 1:2.25 at the head. The maximum footprint of the structure is approximately 40 feet wide at a depth of 6 feet but decreases as the structure comes into shallower water. The core of the structure will be

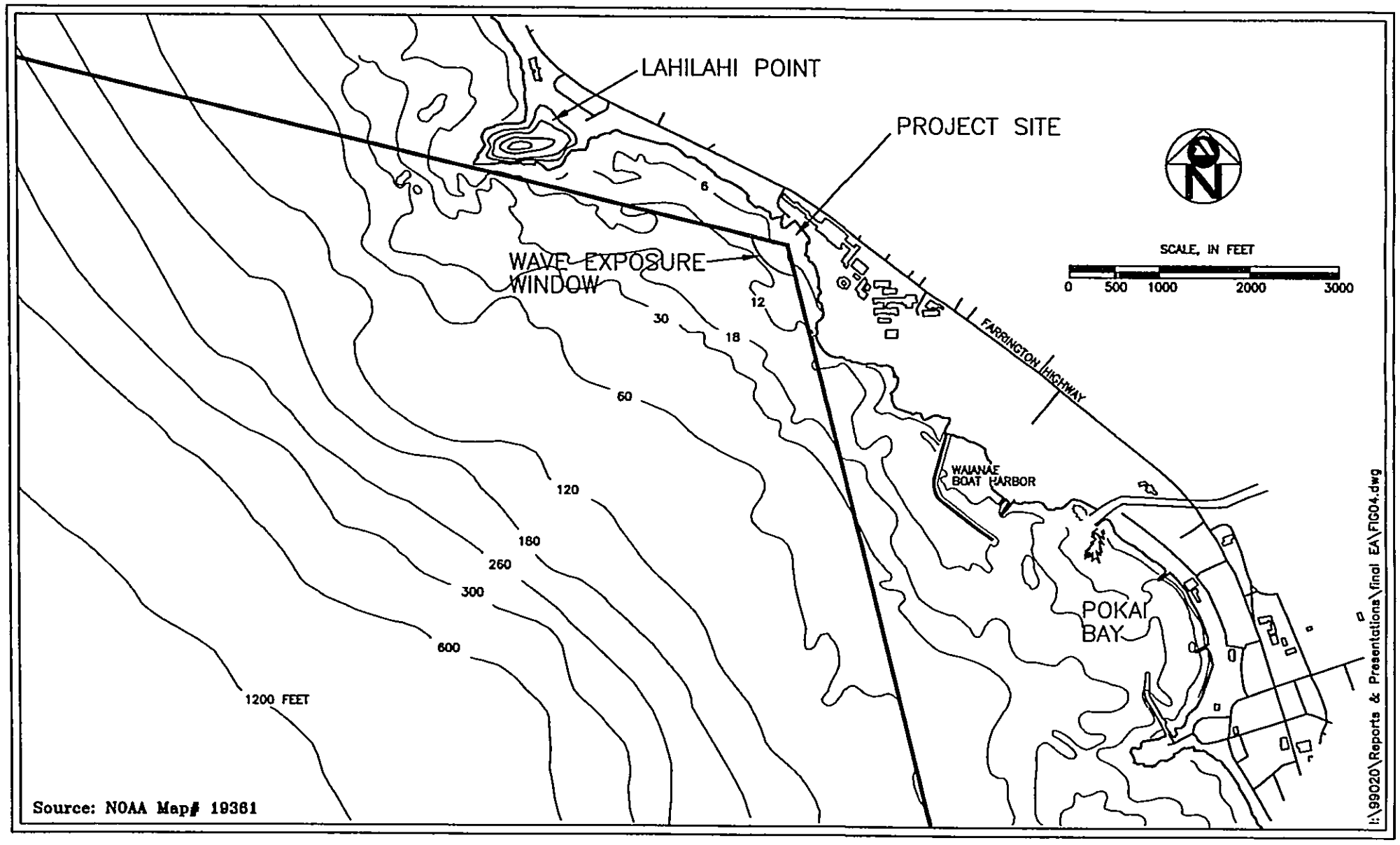

FIGURE 4. WAVE EXPOSURE WINDOW AND OFFSHORE BATHYMETRY

MAUNA LAHILAHI BEACH PARK

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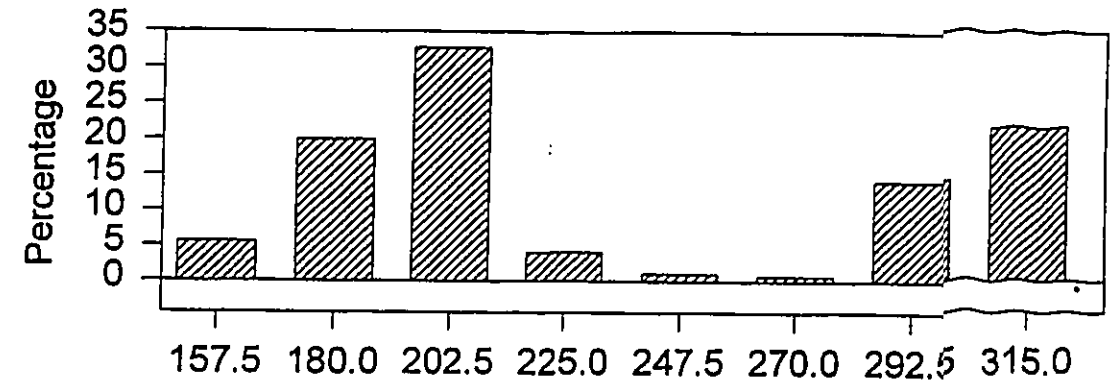
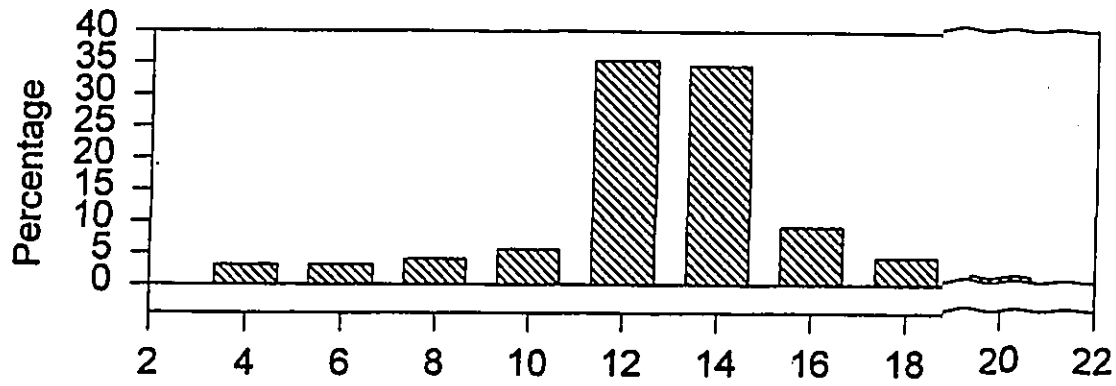
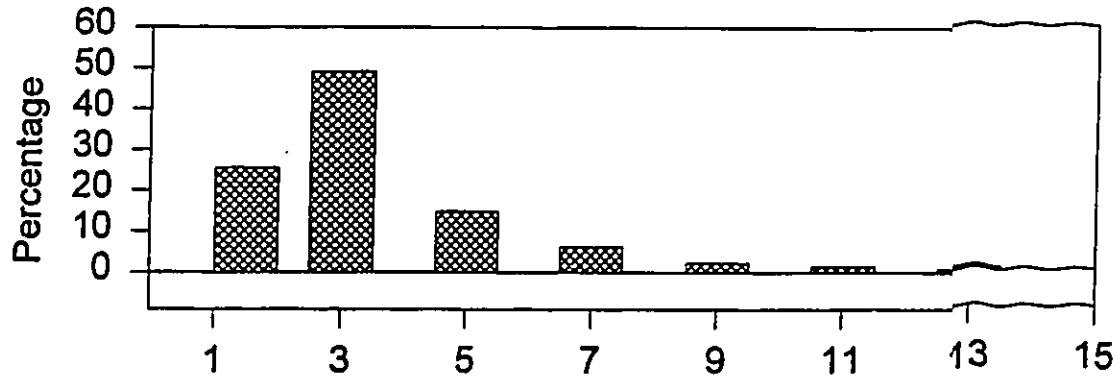


(a) Direction (0=North; 90=East)



(b) Wave Period (Seconds)



(c) Wave Height (ft)

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FIGURE 5. WAVE DATA

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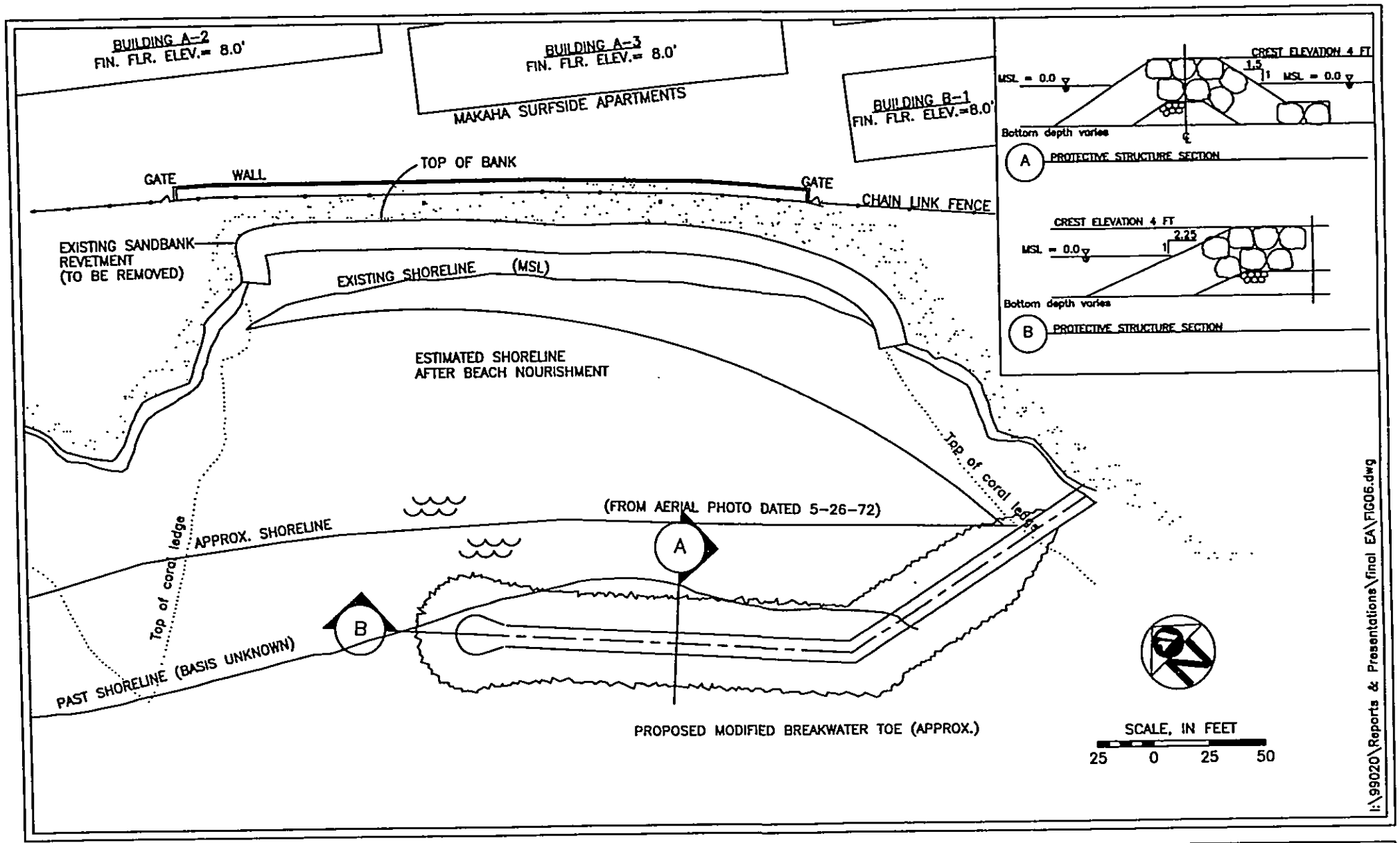

FIGURE 6. BREAKWATER AND BEACH NOURISHMENT PLAN

MAUNA LAHILAHI BEACH PARK

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constructed of stone ranging from 300 – 500 lbs. Two layers of armor stone over the core complete the structure. Armor stone size was determined from the maximum non-breaking wave to be 2.5 tons (roughly 3.5 feet in diameter).

The breakwater is oriented perpendicular to the dominant nearshore wave direction (southwest). The purpose of the breakwater is to intercept a portion part of the wave energy presently impinging on the beach, which will significantly reduce wave scour and advancing erosion. The result will be a more stable environment for maintaining a nourished beach.

The existing sandbag revetment was constructed as an emergency response to offer temporary protection against erosion. Since the revetment was designed to be temporary, the specifications for the sand in the bags called for sand of sufficient quality to be used for beach nourishment. The existing sandbag revetment will be removed and the sand inside the bags will be used as beach nourishment.

In addition to the sand available in the sand bags, another 5,000 cubic yards of sand will be placed on the beach. Replacement sand must be similar to existing sand with median grain size greater than 0.4 mm (see Grain Size Analysis – Appendix A). Larger grain size (up to 1-2 mm) is desirable because it will remain in place longer. Sand used for beach nourishment must have acceptable color and contain 6 – 9 percent silt/clay sized material and little terrigenous or organic matter. Sand sources being investigated include crushed coral sand from Barbers Point Harbor (Grace Pacific), mined sand from Kauai (Jas W. Glover, Ltd) and stockpiled beach sand (Hawaiian Cement).

With the added protection provided by the breakwater, sand loss rate will be greatly reduced and only minimum maintenance is expected. Figure 6 shows the anticipated stable beach configuration after breakwater construction and beach nourishment are completed. Diffraction of waves around the tip of the structure will tend to stabilize the sand at the south end of the cove, the same corner most prone to wave overtopping and advancing erosion. The breakwater was located a sufficient distance from the beach to prevent sand loss due to return currents produced by waves overtopping the structure.

Rubble mound structures such as the breakwater proposed herein are designed as dynamic structures. As such, the rocks will tend to shift and/or settle slightly into the most stable position. Careful stone placement during the construction of the structure will minimize the amount of settlement, but periodic inspection and maintenance are necessary for any breakwater to ensure continued functionality and protection.

A monitoring program is currently being developed in conjunction with the permitting agencies to assess project performance and impacts. The program will cover shoreline monitoring, structure monitoring, biological monitoring, and water quality monitoring. Monitoring will take place on a regular schedule for up to 4 years following completion of the project and immediately after any major storm events. All aspects of the monitoring plan are subject to permitting agency approval.

C. CONSTRUCTION ACTIVITIES

Construction will occur in the following sequence: 1) construct breakwater; 2) remove temporary sandbag revetment; and 3) place beach nourishment (5,000 cubic yards).

Site access will be from the north, and will likely require the contractor to stabilize the banks

along the existing sandbag revetment (refer to Figure 2 in Appendix C for a site plan showing site access and limits of work). Plans and specifications indicate that no grading or grubbing is allowed, and that all ground surfaces beneath stockpiles and operating equipment shall be protected. The contractor is required to develop an erosion control plan to be approved by the City and County Department of Design and Construction in consultation with the State Historic Preservation Division. The contractor shall halt work in the vicinity of any archaeological sites discovered during construction until cleared by the officer-in-charge or the State Historic Preservation Division.

The contactor is also required to prepare and follow a supplemental Best Management Practices Plan (BMP) that describes planned construction methods and the techniques that will be used to prevent pollution of coastal waters. Water quality monitoring before, during and after construction is required for compliance with the State of Hawaii Department of Health 401 Water Quality Certification.

III. CHARACTERIZATION OF AFFECTED ENVIRONMENT

A. SOCIO-ECONOMIC

There are nine ahupua`a in the Waianae District. These include Nanakuli, Lualualei, Waianae, Makaha, Keaau, Ohikilolo, Makua, Kahanahaiki, and Keawaula. The ahupua`a land divisions, which are defined by natural mountain and ridgeline features running from the mountain to the ocean, are still recognized today as important community boundaries. The Waianae District population increased from 3,000 people in 1950 to 37,966 people in 1995.

While the Waianae community has expressed a strong desire to maintain the rural landscape and country lifestyle of the district, it has been faced with growth issues in the areas of housing, commercial development, industrial uses, and public facilities.

An analysis of housing data from the 1980 and 1990 Census shows that the number of occupied housing units increased 12.1 percent during this period. Population growth during this same time period increased 18.8 percent, which indicates a trend towards larger households (more overcrowding), and/or more homeless people (see Table 1). The Makaha Surfside Apartments have 454 Units and over 1,000 permanent residents. This figure represents a significant percentage of the housing inventory in the vicinity of the project site.

Growth in the Waianae District over the past decade has had an impact on public infrastructure and recreation. Popular recreational activities include water sports such as surfing, diving, and fishing as well as land-based recreation such as golf. The Waianae District also has a wide variety of parks including one regional park, eight beach parks, four beach shoreline access points, one district park, three community parks, one neighborhood park, and one cultural park (see Table 2). While the District has many parks, based on the City and County of Honolulu's community-based park standards, there is a current shortfall of 31-39 acres of community-based parks as of 1998 (Department of Planning and Permitting, Waianae Sustainable Communities Plan, 1999).

Table 1 Housing Data

Housing Data Category	Waianae 1980 Data	Waianae 1990	% Change
Occupied Units	9,528	10,680	12.1
Owner Units	4,090	4,879	19.3
Renter Units	3,874	4,538	17.1
Median Year Built	1974	1971	
Median House Value	$77,000	$136,200	76.9
Median Gross Monthly Rent	$264	$602	128.0
Median Rent as % of Income	20.0	30.1	50.5

Source: Department of Planning and Permitting, Waianae Sustainable Communities Plan, 1999.

Table 2 Recreational Facilities

RECREATION	
<u>City Parks & Park Facilities</u> **Regional Parks:** • Waianae Regional Park **Beach Parks:** • Keaau Beach Park • Lualualei Beach Park • Maili Beach Park • Makaha Beach Park • Mauna Lahilahi Beach Park • Nanakuli Beach Park • Pokai Bay Beach Park • Ulehawa Beach Park **District Parks:** • Waianae District Park	**Community Parks:** • Maili Community Park • Makaha Community Park • Pililaau Community Park • Maili Kai Community Park **Neighborhood Parks:** • Kaupuni Neighborhood Park **Golf** • Makaha Valley Country Club • Sheraton Makaha Golf Club **Other** • Surfing • Boating & Fishing • Orchard Nurseries • Mauna Lahilahi Botanical Garden

Source: Department of Planning and Permitting, Waianae Sustainable Communities Plan, 1999.

Mauna Lahilahi Beach Park consists of 8.74 acres extending from Lahilahi Point to Waianae High School and provides a comfort station and picnic facilities. Previously, the park land between the Makaha Surfside and the shoreline was wide enough to accommodate a road that provided longshore access. Presently, the shoreline has eroded so much that longshore access is difficult and possibly dangerous for pedestrian traffic, particularly during high surf.

Economic activity in the Waianae District consists primarily of locally owned, commercial, agricultural, and light industrial businesses. In addition, the United States military uses lands at Lualualei Valley and Makua Valley for training and operations (see Table 3). Some of the lands used by the military have special cultural and religious significance. For this reason, the military is proactive in meeting with the community.

Table 3 Military and Commercial Facilities

MILITARY BASES	SHOPPING CENTERS
• Lualualei Valley – 7,498 acres owned by the U.S. Navy • Makua Valley – 4,130 acres used by U.S. Army for training	• Waianae Mall Shopping Center

Source: Department of Planning and Permitting, Waianae Sustainable Communities Plan, 1999.

B. CULTURAL IMPACTS

Information to assess cultural impacts was obtained through community meetings and ethnographic interviews. We initially contacted key individuals and groups in the community who were known to be active in traditional cultural properties or other types of historic sites. Individuals and groups included: *Hui Malama I Na Kupuna `O Hawai`i Nei*, Mr. William Aila, Mr. Glenn Kila, and Mr. Clarence De Lude. The consensus of the conversations with these community members was that the most appropriate person to contact regarding these issues would be the *kupuna*, or elders of this area.

A meeting with a *kupuna* with ancestral ties to the area yielded some very important information. The land where the park is located is sacred land and the *kupuna* confirmed the existence of burials. He also noted that the area was and still is a good fishing area.

When asked about his opinions about the project, the *kupuna* noted that he thought the project would be a good idea because he believed that the breakwater would likely act like an artificial reef and would attract fish. He also noted that erosion control would minimize the probability of future shoreline burials being exposed. He also requested to be involved with a blessing of the site before any construction begins.

Oceanit also attended community neighborhood board meetings on August 31, October 16, and November 14, 2000. While the neighborhood board park's subcommittee agreed to support the project, not enough votes were obtained in the full board meeting to support the subcommittee's recommendation.

On December 13, 2000 the State of Hawaii Department of Land and Natural Resources held a public informational meeting in Makaha. While most community members supported the project, certain individuals expressed concerns about project including impacts on native hunting and gathering. It is anticipated the construction of the breakwater will cause changes in the abundance of certain marine species at the site. The breakwater boulders will provide surfaces for settlement of benthic organisms such as algae, and invertebrates, including corals. The spaces between the boulders will provide cover for juvenile and small fish, as well as for invertebrates such as lobster, and cave dwelling fish including squirrelfish and eels. Because the breakwater will reduce wave energy into the cove, it is likely that seaweed in the cove area will grow larger and become dominated by faster growing fleshy species of algae.

Concern was also expressed that the breakwater might affect lobster and octopus fishing grounds. The present environment is not conducive to permanent habitation by octopus due to the turbulent nature of this shallow wave impacted zone. Lobster habitat is defined by the presence of holes, cracks, and caves in which the lobsters find refuge. Presently the site is limited in these attributes. However, after construction of the breakwater it is likely that lobster will inhabit the spaces between the breakwater boulders as they do along the Waianae Boat Harbor breakwater.

C. OCEAN/COASTAL ENVIRONMENT

The coastal shoreline of Waianae consists of basalt outcrops and uplifted limestone benches with stretches of white coralline sand beaches. There are no major estuarine areas along the coast, and streams and drainage ditches are of an intermittent nature due to low annual rainfall. The generally calm and clear adjacent coastal waters are excellent for fishing, diving, surfing, and

other water sports.

Waianae's shallow-water reefs are narrow and the offshore reef surface is comprised mainly of hard consolidated coralline pavement interspersed with sand channels and pockets, and coral growth. Basalt headlands, such as Lahilahi Point are sometimes associated with offshore basalt formations. Water depths of several hundred feet can be reached about 200 yards from shore.

1. Erosion

The beaches of the Waianae coast generally consist of light-colored coralline sand (Oceanic Institute, 1976). The subject property has lost most of its beach, and has now formed a pocket type, wave swept, rocky limestone shoreline. Observations during normal wave conditions indicate that the project area has a dominant offshore current regime. This is likely caused by a weak rip current from water returning offshore. During inspection, no shoreline debris was found at the site indicating offshore water flow. This may be the cause of progressive beach erosion experienced at the site. In addition, waves that break over the shelf on the south side of the beach spill into the area and cause an offshore current. During storm conditions, offshore currents produced by heavy wave activity could cause extensive erosion damage to this type of beach.

The construction of a breakwater that will reduce wave activity at the beach and also reduce the strength of offshore currents that move beach sand offshore will contribute to long-term beach stabilization.

Figure 7 shows beach profiles taken within the cove. Beach slopes in the project area are generally in the range of 1:5 to 1:7. Sand samples were taken at the locations shown in Figure 8. Results of grain size analysis of the samples are shown in Appendix A.

2. Waves

A wave exposure window is shown in Figure 4. Deep-water wave data inside this window were analyzed and the results are shown in Figure 5. See Chapter II, Section B: Design Parameters for a more detailed discussion of waves at the project site.

3. Currents and Circulation

Currents on the Waianae coast are weak and dominated by the tides. Figure 9 shows the general offshore flow patterns during flood and ebb tides. Offshore currents show a reversal over the tidal cycle, flowing southeast during ebb tide and northeast during flood tide. The currents closer to shore in the vicinity of the project site generally flow to the northwest during both flood and ebb tides. This is due to eddies that form down-current from Lahilahi point (shown in Figure 9a). Measured current speeds were typically near 0.25 knots (Waianae Boat Harbor Final EIS, 1976).

Because the above study was conducted prior to construction of the Waianae Boat Harbor, additional current measurements were made in the immediate vicinity of the project area. Results are shown in Figure 10, and show a general flow to the NW during ebb tide and to the SE during flood tide.

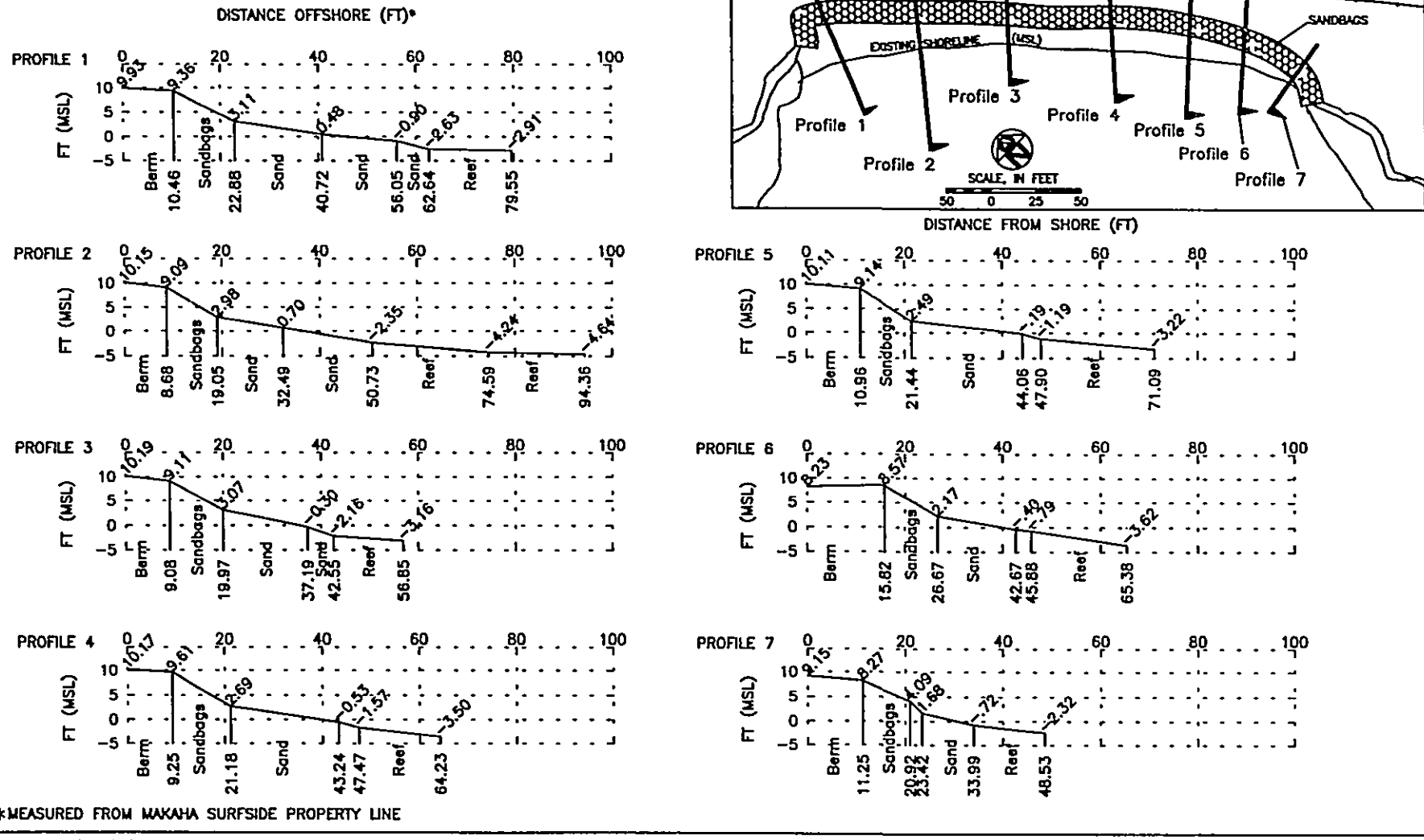

FIGURE 7. BEACH PROFILES

MAUNA LAHILAHI BEACH PARK

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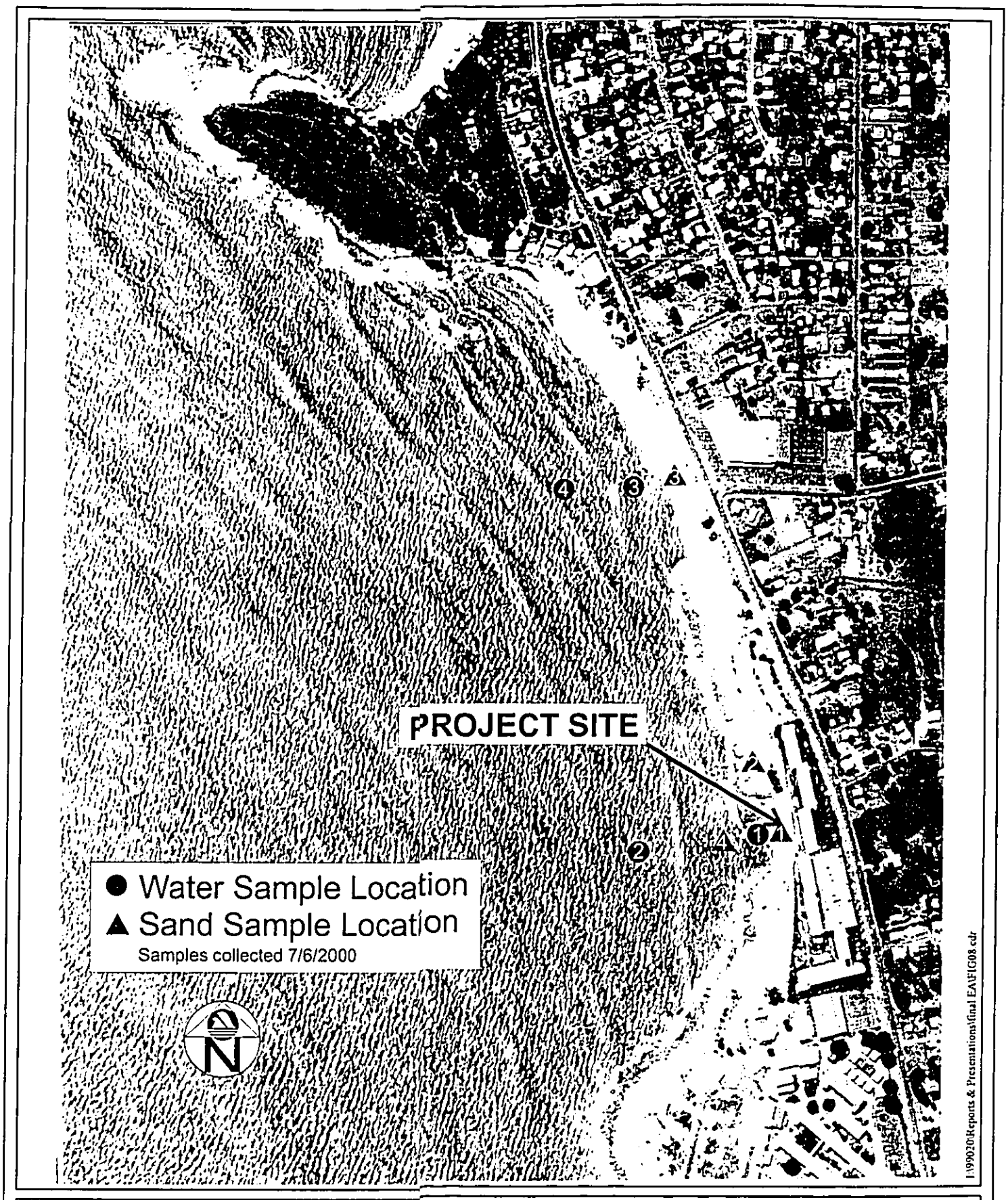

FIGURE 8. WATER AND SEDIMENT SAMPLE LOCATIONS

MAUNA LAHILAHI BEACH PARK

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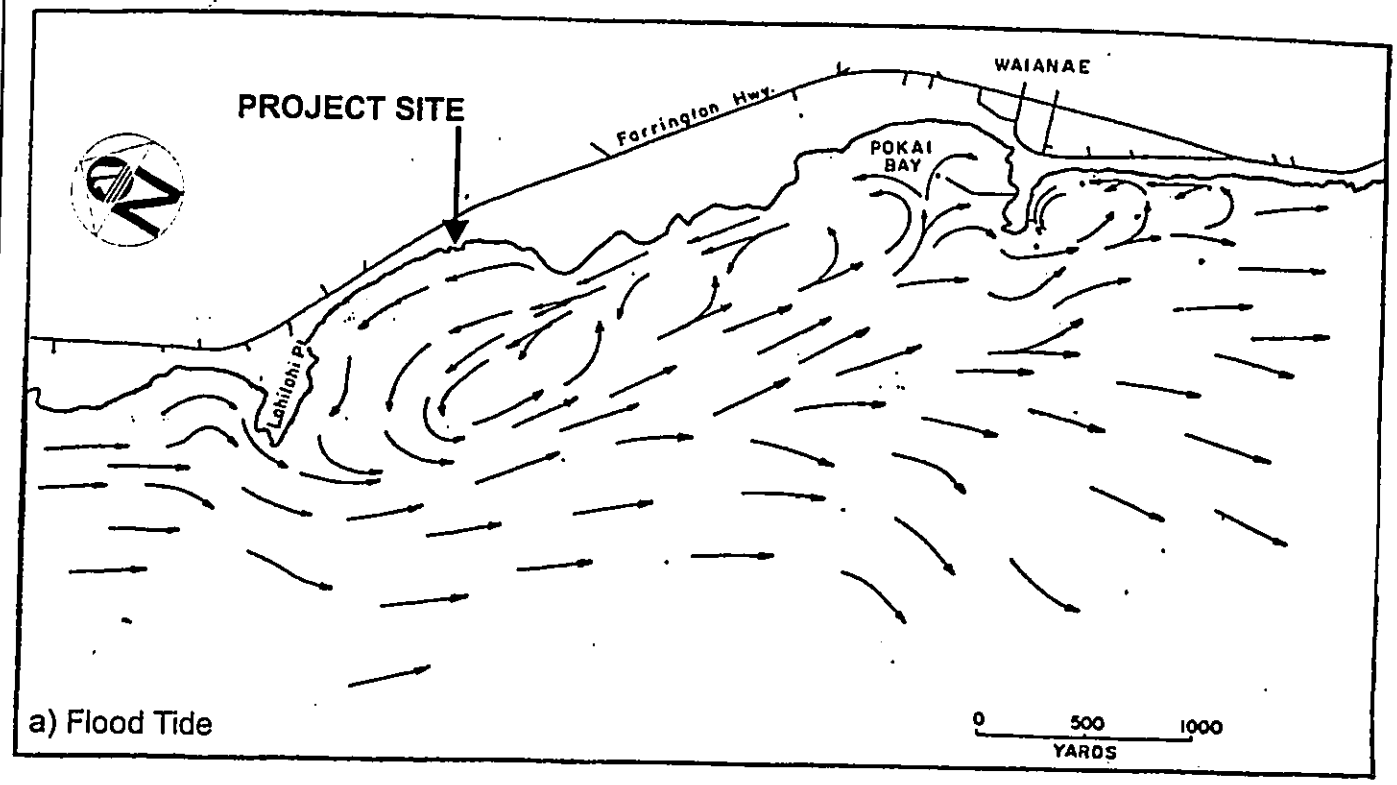

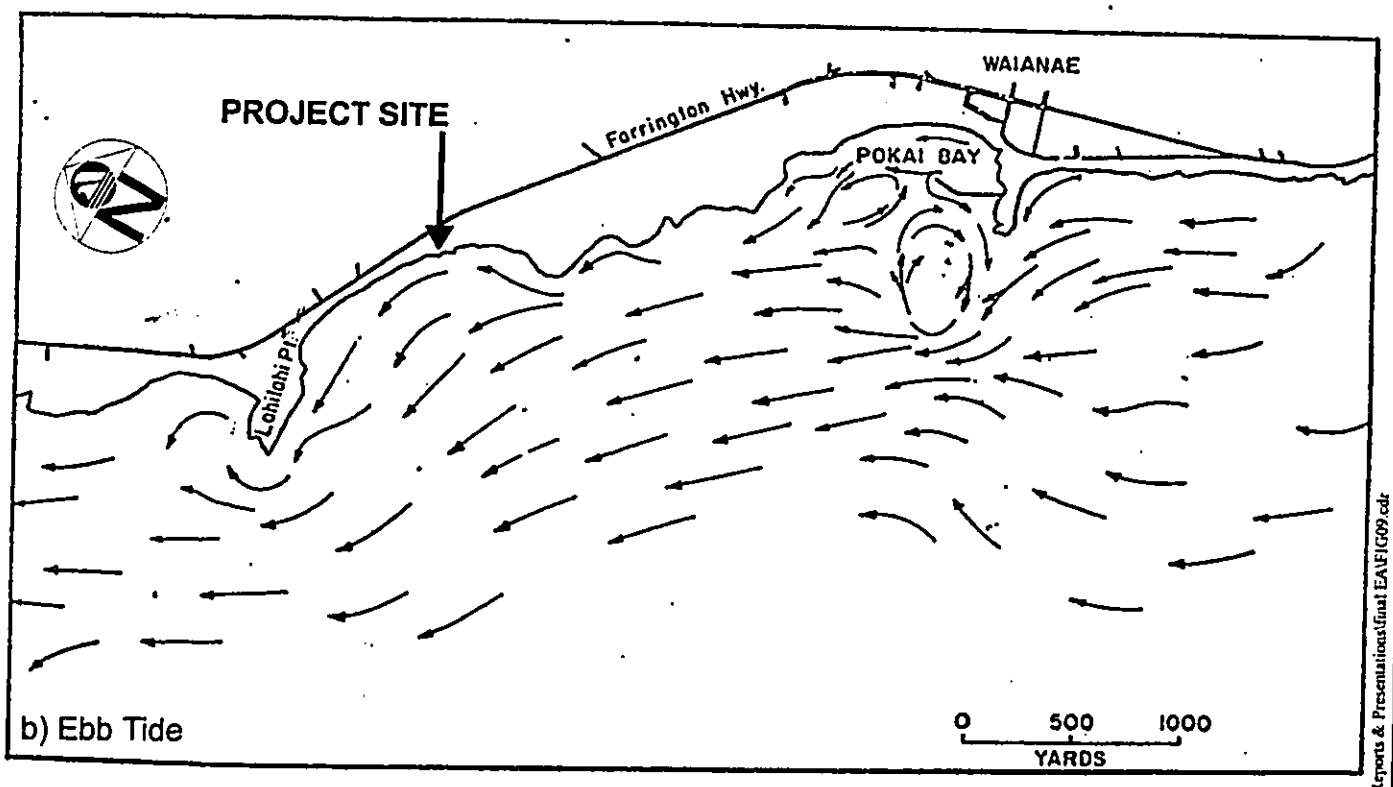

Source: Sun, Low, Tom and Hara, 1962 As Referenced in Waianae Boat Harbor EIS, 1976

FIGURE 9. GENERAL CURRENT PATTERNS

MAUNA LAHILAHI BEACH PARK

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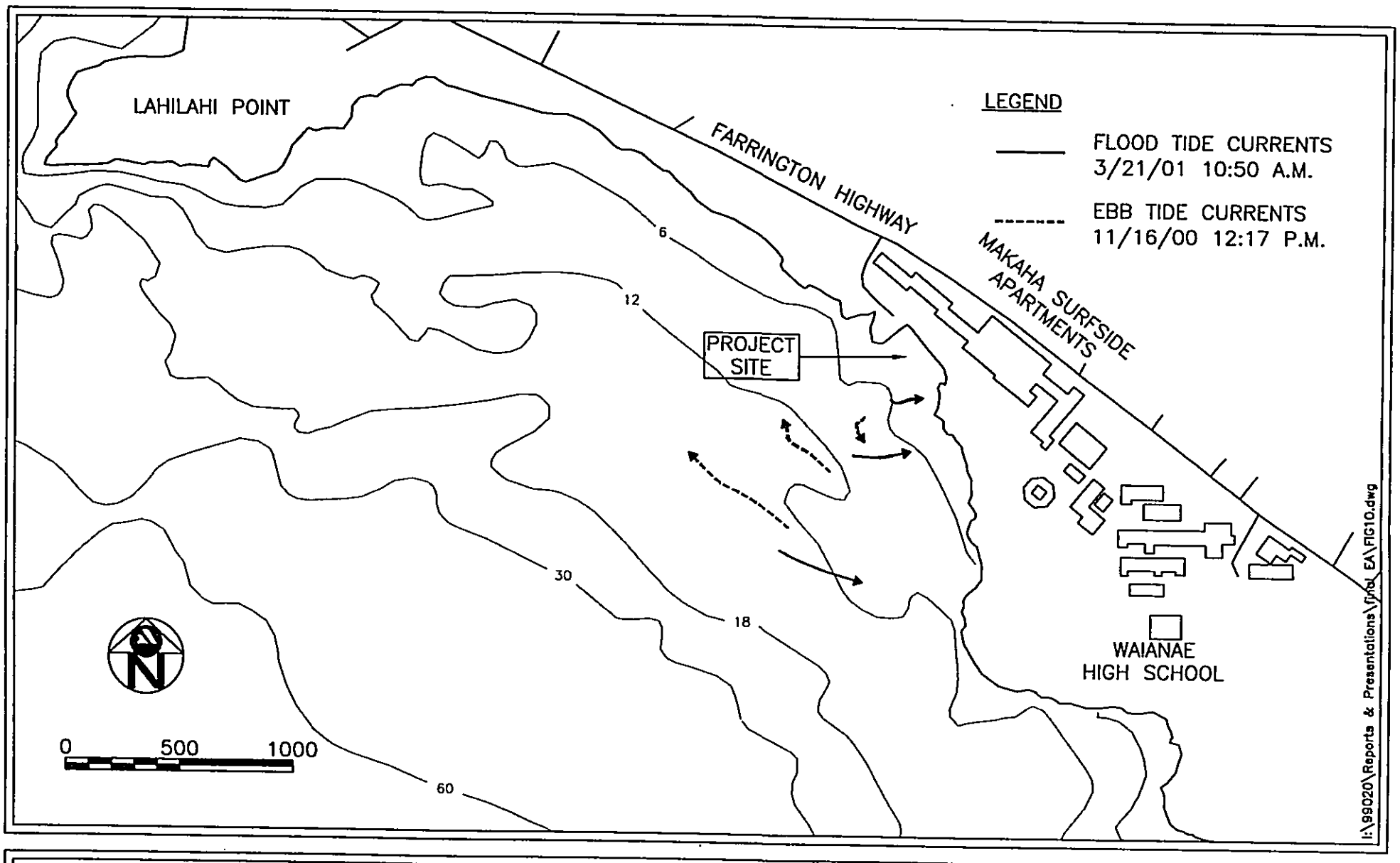

FIGURE 10. CURRENTS IN PROJECT VICINITY

MAUNA LAHILAHI BEACH PARK

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Currents within the cove are driven primarily by breaking waves. Waves approaching parallel to the beach cause an onshore current at the water's surface and an offshore return flow along the bottom. When waves approach in an oblique direction, a net current parallel to the beach results. This is termed the littoral current and causes longshore sand transport. Water moved by the littoral current finds its way offshore forming rip currents. The combination of longshore currents, onshore and offshore currents, and rip currents produces nearshore circulation cells and littoral cells.

4. Water Quality

Waianae coastal waters are categorized Class A in the State Water Quality Standards. Sewer discharges and thermal discharges along the coast are the only major local deviations from Class A standards. Several intermittent streams and drainage ditches do discharge into coastal water; however, their influence on water quality is limited to periods of heavy rainfall. Figure 8 shows the location of water samples. Results are summarized in Table 4. Samples were collected during a low and rising tide.

Samples exceeded State open coastal water quality standards for several parameters, specifically Nitrates + Nitrites [samples #2,3 & 4], Ammonia (NH_4) [samples #2,3 & 4], and turbidity [sample 1].

5. Tides

In Hawaii, tides are mixed semi-diurnal and have a range of approximately 2 feet. There are two high tides and two low tides every day. At Mauna Lahilahi the Mean Higher High Water (MHHW) is 1.8 feet Mean Lower Low Water (MLLW). The extreme low water is –1.0 foot below MLLW. (Note: Mean Sea Level (MSL) = 0.82 MLLW).

Table 4 Water Quality Results

Parameter	Units	SAMPLE #			
		1	2	3	4
PO4	(ug/l)	4.34	5.27	7.13	4.34
Nitrates + Nitrites	(ug/l)	1.96	4.06	6.30	6.30
NH4	(ug/l)	2.52	3.08	5.32	3.78
Tot. Phosphorus	(ug/l)	12.09	11.47	13.33	11.16
Tot. Nitrogen	(ug/l)	116.2	110.5	177.9	115.9
Turbidity	(ntu)	1.22	0.09	0.19	0.13
Tot. Susp. Solids	(mg/l)	7.20	3.07	2.33	2.07
Chl-a	(ug/l)	0.189	0.137	0.144	0.120
Salinity	(ppt)	34.60	34.87	34.77	34.78
Temperature	(deg F)	81.6	80.1	80.7	80.4
pH	-	8.4	8.4	8.4	8.4

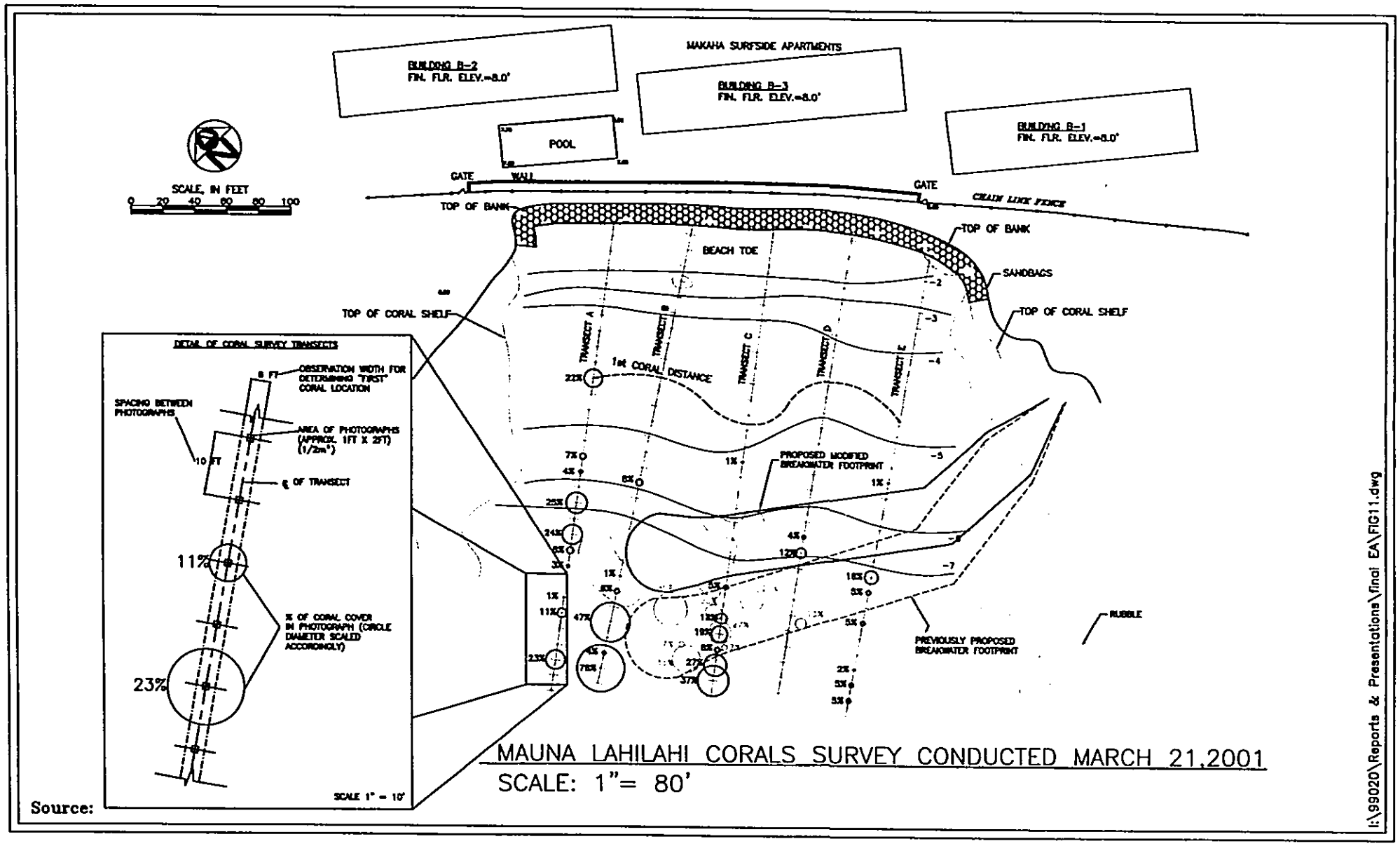
6. Marine Biology

This shoreline is generally categorized as an uplifted calcareous or carbonate solution bench separated at the shore by a raised, sharply pitted limestone face undercut at the base [Devaney and Eldredge, 1987]. Along this coast the limestone shoreline appears to be the remnant of a prehistoric deposition of beach rock when the sea was at a higher level. At the present sea level erosion has broken through the fascia of beach rock forming this small cove. Remnants of the old shoreline escarpment are visible underwater just seaward of the boulders and exposed limestone in the center of the cove. The cove itself then represents relatively new marine benthic habitat that is being colonized by a number of species.

The biological habitat present within the project area is determined to a large degree by physical characteristics including depth, wave energy, substrate type, and water quality. The cove is quite small, measuring approximately 350 feet across the mouth and 250 feet from the beach to the mouth; for a total area of roughly 100,000 square feet. The cove is also relatively shallow, sloping gradually from the beach toe out to a maximum depth of 6 feet at the mouth. Even small southern swells or wind-generated chop lead to waves large enough (1-2 feet) to break across the mouth of the cove creating a turbulent shallow water habitat. Therefore wave energy is a significant factor in determining species that can inhabit a given area.

The site was examined on three occasions by a marine biologist from Oceanit [Bourke]. On the first occasion general qualitative observations were made using mask and snorkel. On the second occasion a transect was laid out along the path of the proposed structure to quantify benthic habitat. On both of these first two occasions the water was too turbulent to obtain photographs of adequate quality for publication or documentation of species cover. The survey quantified coral cover in the footprint at the end of the breakwater within 16 square meter quadrants. Coral cover would be expected to be the highest at the extreme end of the breakwater, providing a "worst case" highest estimate for coral coverage along the length of the breakwater. Data from this survey was quantified using two standard methods. By the "point method" eight of the sixteen quadrants had 0 percent coral, two were less than 10 percent cover, two at 10 to 20 percent cover, two at 20 to 30 percent cover, and two at 30 to 40 percent cover, for an average of 10.8 percent cover. By the visual quadrant estimate method, the percent coverage was 5.8%. Coral cover by either method can be qualified as patchy.

During a third visit to the site water conditions were much better, with no swell and much improved water clarity. On this occasion five transects, each roughly 300 feet long, were surveyed. The five transects were set perpendicular to the beach at 50 foot intervals across the beach. Each transect began at the edge of the lowest sand bag and ended in approximately 8-feet of water well beyond the area of the proposed breakwater. Photographs were taken at 10 foot intervals of a 1/4 square yard quadrant frame held against the substrate. In addition, the distance was recorded along each transect from shore to the first coral within one yard to the left or right of the transect tape. This provided an estimate of the absolute inner limit of coral growth in the cove. Photographs were taken to document the general condition of the reef beyond the breakwater at 300' to 700' off shore. Graphical results of the survey are shown in Figure 11.



Source:

MAUNA LAHILAHI CORALS SURVEY CONDUCTED MARCH 21,2001
SCALE: 1"= 80'

FIGURE 11. BREAKWATER LAYOUT AND CORALS SURVEY RESULTS

MAUNA LAHILAHI SHORELINE PROTECTION

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As can be seen in Figure 11 there is isolated coral growth from about 100 feet off shore to about 200 feet off shore, but significant coral growth only begins to occur about 220 to 250 feet off shore. While none of these coral heads are very large and do not contribute significantly to the structure of the benthic habitat, they do account for up to 1/3 of the bottom coverage in certain areas. To avoid these areas of high coral coverage, the tip of the initial breakwater design has been moved shoreward approximately 50 feet from the original design.

Although no turtles were seen at the site during biological surveys, it is highly probable that this cove area provides foraging habitat for turtles. However, the cove and adjacent areas are too shallow and turbulent to provide any nesting habitat for turtles, and the beach does not provide adequate sand depth for nesting. Research has never suggested foraging habitat area was a limiting factor in the recovery of sea turtle populations in Hawaii. Similarly no impact is foreseen to the occasional monk seal along this shoreline from the proposed project.

The cove may be divided into four descriptive ecotypes for the purposes of this discussion:

1. Intertidal zone with exposed rock faces and tide pools;
2. Sandy beach and wave swept rubble;
3. Shallow water zone with wave-swept rocks; and
4. Deep-water zone (to 8 ft).

Intertidal Zone

This coastline, in general, consists of a series of limestone headlands enclosing small sand beaches. The relatively flat limestone bench (consolidated coral from a previous higher sea level) is eroded and often undercut at the shoreline presenting a vertical drop of several feet to the water. This creates a wave impacted intertidal and subtidal hard substrate. The headlands and boulders flanking both sides of the bay are representative of this biotype.

Although the tidal range in Hawaii is only about three feet, the true intermittently wetted zone in this vertical habitat is extended both upward and downward by waves. In this zone most of the surface is colonized by a myriad of algae and invertebrate species adapted to the high-energy wave impact. Typical algae species include *Giffordia, sp., Turbinaria ornata, Grateloupia sp., and Sargassum echinocarpum.* Invertebrates typically seen in this habitat include the `a`ama rock crab (*Grapsus tenuicrustatus*) above water, rock boring sea urchin (*Echinometra mathaei*), Opihi (*Cellana sp.)*, pipipi (*Nerita* sp.) at the water interface, and various encrusting sponges, particularly in the underwater caves.

The erosive powers of the waves are coupled with biological erosion in this zone as sea urchins and mollusks wear away at the rock surface creating jagged sculptured surfaces in the relatively soft limestone. On the north shoreline of the cove the higher limestone bench provided a few splash zone tide pools that are inhabited by typical tide pool fish including gobies, and juvenile surgeon fish (*manini, A. sandvicencis*). The southern shoreline has more boulders forming interconnected tide pools regularly washed by waves.

Sandy Beach and Wave Swept Rubble

The narrow beach on the landward side is presently layered with large sand bags to reduce erosion, exposing a strip of sand only about 10 feet wide at low tide. This entire zone is subject to rapid movement during periods of heavy surf, and species are typically either short-lived with rapid re-colonization, or have the capacity to burrow deeply into the substrate. No ghost crab (*Ocypode sp.*) burrows were seen on the beach. The sand beach habitat ends abruptly at the water line and is replaced by rock and coral rubble substrate. The rubble substrate is visibly barren on the surface, but active communities of small crustaceans, brittle stars and annelid worms can be found underneath the rocks. Very small patches of the green algae, *Ulva*, could be seen on some of the larger rocks in this zone. No coral was present in this zone.

Shallow Water Zone

The center of the bay is shallower than either side with large (2-5 foot diameter) rocks emerging above the water line even at a moderately high tide. Some of these rocks appear to be limestone remnants of a previous coastline eroded to below waterline. These rocks are still physically part of the substrate although many are severely undercut forming shallow caves and ledges underneath. Other large rocks are broken reef fragments that are probably the result of storm surf. This habitat is characterized by greater algae cover with an unbroken algae mat, fewer mobile invertebrates on exposed surfaces, and some small patches of encrusting coral beginning at about 100 feet from shore. These corals were primarily small (<10 sq in.) squamous colonies of lobe coral (*P. lobata)* with a few scattered very small colonies of cauliflower coral *Pocillopua meandrina* and lace coral (*P. damicornis*) noted occasionally in this zone. The most plentiful large invertebrates were sea urchins wedged tightly between or under rocks.

The surge and impact wave energy in this zone, (coupled with grazing by herbivorous fish during high tide quiescent periods) limits the algae growth to a short dense mat of fleshy algae (*Sargassum, Dictyota, Dictyosphaeria, Enteromorpha, Chnoospora, Amansia*) with patches of encrusting calcareous algae. Fish in this zone tend to be small mobile species adapted for life in this wave swept habitat and include damselfish (*Stegastes fasciolatus, Abudefduf abdominalis*), small wrasses (Hinalea, *Thalassoma duperrey, T. purpureum*), and a few juvenile surgeonfish. Although small caves and under-cuts were plentiful, no typical cave fish (squirrel fish, soldier fish, Aweoweo) or lobster were seen. However, these species are likely to inhabit this zone.

Deep Water Zone

The "Deep Water" zone begins at a depth of about 4 feet and extends out to a depth of about 8 feet, 300 feet from shore. This zone is subject to a great deal of wave surge, but is spared the constant impact energy from breaking waves. The surge picks up sand from small pockets at the base of the ledge. This sand serves to scour the lower portions of any hard substrate within about a foot off the bottom, and limits growth in these areas to fast colonizing and fast growing brown or red algae.

Above this depth, however, the hard substrate provides habitat for at least four species of coral including (from most to least common) lobe coral (*Porites lobata*) cauliflower coral (*Pocillopora meandrina*), blue rice coral (*Montipora flabellata*), and lace coral

(*Pocillopora damicornis*). These corals are isolated and do not cover a large portion of the substrate area. Squamous (flat) colonies of lobe coral account for the most cover.

Nowhere within the cove, delimited by the 300' survey transects, did coral growth provide any significant structure to the substrate. All corals within the cove are growing over pre-existing substrate, primarily beach rock or lithified sandstone, which provides the benthic structure of the site. It is probable that coral growth in this nearshore area is limited by a number of factors including siltation, wave energy, sand scouring, and rare but devastating impacts from large storms. The benthic surface is highly irregular, or rugose, in the "deep" portion of the cove offering numerous surfaces, shallow cracks, holes, and ledges for fish and invertebrate habitat. However, it is important to note that this 3-dimensional structure is the result of erosive actions on the limestone or beach rock substrate and not due to coral reef growth. There are individual corals on the submerged and eroded beach rock substrate, but these colonies do not form a reef structure in or near this area. Further, these individual coral colonies are all, in general, small and subject to regular erosive mortality due to seasonal storms and large waves.

Whereas in the shallower boulder zone the coralline algae tended to be of a flat encrusting morphology; in this deeper zone more ramose species such as *Amphiroa fragilissima*, *Corallina* sp, and *Porolithon* become more common. A greater diversity of fish were seen in this zone, as would be expected, and ranged from numerous juvenile surgeonfish (Acanthurids) of several species, adult butterfly fish (primarily lemon peal, *Chaetodon miliaris*), small blue-line snappers (Ta`ape, *Lutjanus kasmira*) and adult parrot fish (*Scarus sp.*). Kole (goldring surgeonfish, *Ctenochaetus strigosus*) were not seen during visits to the site. The only Manini (*Acanthurus sandvicensis*) seen were small juveniles in the tide pools and shallow water boulder habitats.

A well developed coral reef exists offshore of the project site, beginning in about 15 feet of water approximately 400 feet from shore. The reef is a mixed community made up primarily of lobe coral (*P.lobata*) with vertical relief up to about 6 feet in height separated by open sand patches or open expanses of hard bottom. This reef continues out to a depth of at least 40 feet.

Additional information on the marine environment can be found in the Final Environmental Impact Statement, Waianae Boat Harbor, Waianae, Oahu, Hawaii (1976).

D. LAND ENVIRONMENT

1. Climate

The climate at the project area and surrounding area is warm, sunny and dry, which is characteristic of the leeward shores of Oahu. Average temperatures (Fahrenheit) in Waianae range from the high 60's to low 80's in winter months and between the high 60's and mid 80's during summer months. Average annual rainfall at the project site is between 20 and 30 inches (Helber, Hastert & Kimura Planners, 1989).

2. Existing Land Use

The project site is bounded on the southeast by Waianae High School and on the west by the Pacific Ocean. Abutting the project site to the northeast (mauka) are the Makaha

Surfside Apartments. Further northwest along the coast is Lahilahi Point with its adjacent beach park and urban/resort developments. Further southeast are the Waianae Boat Harbor and Pokai Bay. *Mauka* lands of the Waianae Valley are used for dairy, diversified agriculture, and low-density residential use with more densely populated neighborhoods closer to the coastline. Residential uses (single-family dwellings) predominate near the ocean around Waianae town. The project site is zoned P-2, General Preservation and designated as Park land according to the City's Development Plan, which is designed to help guide future public improvements and zoning (see map – Appendix A). The shoreline area is in the City's Special Management Area, which is designed to protect natural, cultural, and recreational resources of the coastal zone of Oahu.

3. Visual and Open Space

The project area as viewed from the Makaha Surfside Apartments includes the Pacific Ocean to the south and west and Kamaileunu Ridge of the majestic Waianae mountain range to the east and north. The Coastal View Study (Department of Land Utilization, 1987) identifies significant stationary views from the public beach area adjacent to Mauna Lahilahi Point, which is approximately ¾ mile northwest of the project site. The project area itself is a rocky shoreline with an escarpment and cannot be seen from Farrington Highway, the main coastal roadway.

4. Surface Hydrology and Drainage

Storm runoff from the hinterland during wet weather is directed to two drainage channels. One exits a few hundred feet north of the site and the other exits south of the Waianae Boat Harbor. Local rainfall is small and drainage from the site flows as sheet flow into low areas and into a narrow drainage channel at the high school.

5. Flood Hazard/Tsunami/Hurricane

The Makaha Surfside is located in flood zones VE and AE, an area subject to tsunamis or other velocity hazards, with a base flood elevation of 13 feet. The Flood Insurance Map for the project area is included in Appendix A.

Although hurricanes occur infrequently in Hawaii, they occasionally hit the islands. Hurricane Iwa in 1982 and Hurricane Iniki in 1992 resulted in significant damage on Kauai. Both hurricanes also caused coastal flooding and damage on the leeward coast of Oahu, including the Makaha area. During Hurricane Iwa, wave runup and inundation reached as far as 500 feet inland. Hurricane Iniki also resulted in extensive flooding as waves over 15 feet inundated the shore and damaged seawalls and coastal structures (Sea Engineering, 1997).

6. Soils

According to a soil survey by the United States Soil Conservation Service (SCS, 1972), soils *mauka* of the shoreline at the Makaha Surfside are classified as HnA, Hanalei silty clay with 0 to 2 percent slopes. This type of soil was typically used for sugarcane, taro, and pastureland. Lands to the northwest of the project site are classified as beach sand (BS) and lands southeast of the project site, including Waianae High School, are listed as

coral outcroppings (CR).

7. Flora/Fauna

A field reconnaissance was conducted to identify flora and fauna at the project site. The rocks on the beach are home to several species of marine algae (*Grateloupia phuquoensis & Symploca hydnoides),* snails (*Nerita picea* [pipipi] & *Littorina pintado* [pipipi kolea]), and shore crabs (*Graspus tenuicrustatuts*). The open shoreline area does not offer habitat or dwelling space for any land mammals.

No sand dwelling birds were observed on the field reconnaissance. Surrounding the project site on the remainder of the City and County Park are several large mature kiawe trees (*Prosopis sp.*) and miscellaneous weeds and grasses.

8. Archaeology

A human burial site, identified as 50-80-07-4064, was located on the beach. According to the State Historic Preservation Office, the burial was disinterred from the project site and reinterred at Lahilahi Beach. Other burials may exist at the project site. A more detailed description of archaeological deposits in the area can be found in the correspondence with the State Historic Preservation Office included in Appendix C.

9. Noise

The major source of noise in the area is Farrington Highway, located approximately 300 feet *mauka* (inland) of the project site. The Makaha Surfside Apartments are located between the project site and the highway. Due to the distance from the highway to the project site, the highway is not a major factor in ambient noise levels for this project. Natural sources of noise from wind and waves are typical of similar shoreline locations in the Makaha area.

10. Air Quality

Ambient air quality is generally good due to offshore trade winds, typical of similar rural shoreline areas in the vicinity of the project site.

11. Traffic

Access to the project site is via Farrington Highway. In the vicinity of the project area, Farrington Highway is a four-lane paved road running parallel to the shoreline along the leeward coast of Oahu. Farrington Highway serves local traffic within the Makaha area and acts as a commuter highway for trips outside of the Waianae District, and may become congested during peak traffic hours. Peak traffic periods are between 5-7 a.m. for morning commuters to Honolulu.

12. Utilities

There are no electric, telephone, or water utilities serving the project site.

IV. IMPACTS, ALTERNATIVES AND MITIGATION

A. *DIRECT IMPACTS*

1. Flora/Fauna

Marine Flora/Fauna

The proposed breakwater will consist of large natural-stone boulders placed on existing substrate, thereby covering a portion of the cove's marine life habitat. The base of the breakwater is estimated to cover approximately 10,000 sq. feet of existing bottom. At least four species of coral were identified in the vicinity of the proposed breakwater. A very few of the small corals (*Pocillopora sp*) may be able to be transplanted. However, due to strong wave action, most of the corals have assumed squamous, flattened formations tightly layered over the substrate that would make them impossible to move. Most of the corals appear to be relatively young. Corals in this zone are likely subject to periodic destruction from large winter waves. It is also important to note that the nearshore bottom throughout the cove was previously covered by sand prior to being eroded. This may in part explain the scarcity and immaturity of corals observed at the project site.

The location of the breakwater was chosen to minimize impacts to existing corals. After a detailed survey of corals in the area, it was decided to move the structure tip shoreward approximately 50 feet from its original position to avoid areas of higher coral density. Figure 11 shows the results of the coral survey, along with both the original and revised structure locations.

The loss of benthic habitat and associated organisms is partially mitigated by the new habitat represented by the structure itself. Coastal rubble structures provide substratum for the establishment of artificial reef communities. Many species are attracted to the structures, as evidenced by the popularity of breakwaters as fishing locations. The stability of the large boulders used for the breakwater should permit colonization by coral species and provide increased habitat for cave dwelling species such as lobster and squirrel fish.

The beach nourishment sand will also cover a portion of the marine habitat near the shoreline. A portion of the algae and invertebrates that exist in the shoreline area may be lost. However, most of these species are well adapted to survive burial, and will re-colonize the newly available substrate. The increased beach area will also provide greater habitat for sand dwelling species.

There should be no discernable long-term negative impacts to sea turtle populations. The protection from wave energy offered by the breakwater could increase algae growth within the cove, which might attract turtles to feed within the cove. Short-term impacts to sea turtle may result from restricted access during construction. These impacts will be temporary, and limited to the project area.

Long term biological monitoring is part of the mitigation being required for the project, and is discussed in more detail at the end of this chapter.

Terrestrial Flora/Fauna

The proposed project should have no significant impacts on flora or fauna within the park land with the exception of temporary impacts to ground cover from construction staging.

2. Water Quality

During construction of the breakwater, suspended sediment levels may be temporarily elevated in water immediately adjacent to the operations. Construction specifications will call for the contractor to clean all stone before placement in the water in order to minimize the impacts of suspended sediment. No dredging is planned for this project. A detailed Best Management Practices (BMP) plan and water quality monitoring plan will also be required by the State of Hawaii Department of Health (DOH) Clean Water Branch.

3. Currents and Circulation

Currents and overall circulation outside the proposed structure are not expected to be affected since the proposed structure is located within the cove. In fact, the proposed breakwater extends only marginally seaward of the old shoreline. Furthermore, the amount of water between the proposed structure and shoreline is insignificant in comparison to the volume of water involved in offshore currents.

Currents and circulation between the proposed breakwater and shoreline will likely be reduced. The reduction of wave energy within the cove will weaken the currents that presently contribute to offshore sand loss. The structure was designed to provide sufficient local circulation to maintain water quality within the cove. Water that may occasionally overtop the breakwater will flow back offshore along the inside flank of the breakwater. The breakwater is located sufficiently far from the beach to ensure minimum impact from this return current. The permeability of the breakwater will also allow a certain amount of water to pass through the structure.

4. Traffic

There will be a temporary increase of heavy vehicle traffic on Farrington Highway as sand and stone are brought to the project site. The contractor will be required to comply with City and County and State traffic regulations.

5. Air Quality

Fugitive dust from hauling and sand deployment activities, exhaust emissions from vehicles, and possible traffic disruptions may temporarily degrade air quality at the project site. Dust is anticipated to be minimal. The contractor will be required to comply with City and County of Honolulu and State Department of Health regulations for dust concentrations during the construction period.

6. Noise

During the nourishment process, noise is not expected to cause any significant impacts to neighboring residents. During sand deployment, trucks and sand moving equipment will generate higher than normal noise levels. Mitigation of vehicle noise to inaudible levels is not possible. However, construction hours will be restricted to daytime hours only.

7. Runoff

No impact on existing drainage is expected from the proposed action.

8. Archaeology

Since no excavation is proposed for this project, impacts on archaeological resources are not anticipated. At this time, access to the project site is anticipated to be from the north. Consequently, equipment and materials will need to be brought across the bank above the existing sandbag revetment. This will require stabilization of the banks in the vicinity of the project area (see Figure 2 in Appendix C).

Construction plans and specifications require the contractor to submit a site access and erosion control plan for approval by the project engineer. The purpose of the plan is to ensure that archaeological and historical sites are not damaged or disturbed. The State of Hawaii Historic Preservation Office has also requested a qualified archaeologist to conduct on-site monitoring of the installation of protective fencing and ground protection. Refer to Appendix C for more details on the archaeological monitoring requirements.

9. Beach Use

Beach use will be curtailed during the construction period. This disruption will be temporary. The completed project will enhance beach use in the area.

10. Hurricane/Storm Events

The proposed breakwater is not designed to prevent overtopping of waves from hurricanes, tsunamis, or exceptionally large swells. A structure capable of such protection would be unreasonably large and expensive to construct. Some degree of repair to the breakwater and beach may be required after severe storms such as Hurricane Iwa or Iniki. Proposed monitoring for the project includes monitoring the structure and beach immediately after a hurricane or severe storm.

11. Erosion

The breakwater and beach nourishment will reduce erosion within the project area. The breakwater structure orientation was chosen to minimize any erosion impacts on surrounding beaches. Specifically, the tip of the structure was oriented towards hardened shoreline in order to prevent adverse impacts to surrounding sand coastlines that might be caused by wave energy reflecting from the structure tip.

Because the structure is oriented almost parallel to the shoreline and is located almost entirely within the existing cove, it is not anticipated to trap any sand from the littoral drift in either direction. Furthermore, continuous erosion at the site indicates that there is no net sand transport into the area from beaches on either side.

Monitoring of the structure and surrounding beaches is also being required by the permitting agencies. This monitoring will help verify the performance of the structure and determine if additional beach nourishment will be required to provide continued protection against erosion.

B. *INDIRECT AND CUMULATIVE IMPACTS*

1. Nearshore Marine Life

Water currents and turbulence along the base of a breakwater can produce a scouring action that may limit the utilization of those areas by benthic organisms. This is primarily confined to the bottom immediately adjacent to the breakwater perimeter.

However, breakwater surfaces above the scour zone will provide habitat for algae, coral and invertebrate settlement. Benthic algae inside the breakwater may increase due to a portion of destructive wave energy being blocked. Greater algae densities inside the breakwater and new algae substrate along the edges of the breakwater are likely to attract herbivorous fish and sea turtles to the area.

2. Water Quality

The breakwater and renourished sand beach will prevent erosion of backshore soil and clay, which should help reduce turbidity related to erosion.

3. Visual and Open Space

As noted in Section C of this chapter, the public beach area adjacent to Mauna Lahilahi Point contains significant stationary visual resources. While the project site is located approximately ¾ miles from Mauna Lahilahi Point, the visual features in this shoreline area should respect the visual characteristics of the general area.

As noted in the Coastal View Study (Department of Land Utilization, 1987), coastal views are already "severely" impacted by mid-rise apartments adjacent to Mauna Lahilahi. The Makaha Surfside Apartment buildings block significant coastal roadway views of the ocean. The proposed plan would have impacts on pedestrian views from the ocean as the 250 foot long breakwater would rise approximately 4 feet above mean sea level. The proposed breakwater is several feet lower than the coral shelves and land surrounding the project site (6 to 10 feet MSL) and so will be partially blocked when viewed from surrounding areas.

The sand in the sandbags will be used along with an additional 5,000 cubic yards of clean sand to create a sandy beach within the cove. Sand nourishment is ancillary to recreational uses in the surrounding park areas as designated by the City and County of Honolulu. The sand nourishment will not visually intrude on the regional park open space and will improve the aesthetics and increase recreational usage of the beach.

Shoreline vegetation will be planted in the backshore area as a part of general park improvements being proposed as a separate project (AM Partner, Inc. and Environmental Communications, Inc). Visual impacts from the proposed breakwater need to be weighed against the visual improvements to the area from beach nourishment, shoreline re-vegetation, and removal of emergency protection schemes such as sandbags – all of which would not be feasible alone if an alternative such as the proposed breakwater was not available to keep the sand in place.

4. Surf

A 1971 surfing site inventory does not show a surfing site at the project location. The nearest surfing site(s) are at Mauna Lahilahi Point. Impacts to surfing are not anticipated.

5. Beach Use and Water Safety

The breakwater and beach nourishment will improve the recreational use of the beach and may increase beach park use. Breakwaters are also popular fishing locations, which may further increase use of the beach park.

During periods of high surf, waves could pose a danger to anyone standing on the breakwater. Warning signs informing people of potential hazards should be posted at appropriate locations.

6. Noise and Air Quality

Long-term noise and air quality will not be impacted by the proposed action.

7. Traffic

There are no anticipated long term impacts to traffic and parking.

8. Archaeology

The breakwater and renourished sand beach will prevent erosion of backshore soil, which should protect burials and other archaeological sites in the vicinity of the project.

C. ALTERNATIVES

The following alternative erosion control methods were considered before selecting the proposed attached breakwater / beach nourishment solution to the erosion problem.

1. No Action

The current bank is within 10 feet of the condominium property, and without protection the ongoing erosion and wave inundation will continue. Evidence of continued erosion can be seen in the wear and tear of the sandbag revetment – repairs and maintenance of the revetment are necessary to provide continued protection. Further erosion could eliminate access between the north end and south end of the beach park, and would also begin to threaten structures on the Makaha Surfside property. Flooding of the backshore area would continue during periods of high surf.

2. Beach Nourishment Alone

Beach nourishment involves placement of sand along the beach to replace material lost to erosion. Nourishment is directed at increasing the width and height of the beach to restore its protective function as a buffer between land and sea. An added incidental benefit would be the increased beach area available for recreational use.

The continuing erosion at the project site indicates an insufficient sediment supply. Therefore, any sand placed on the beach would likely continue to erode. Without the protection of a breakwater it is unlikely that any sand placed on the beach would remain for an extended amount of time.

3. Revetment

A revetment is a structure constructed along the shoreline to protect the land behind it from erosion. The existing sandbags constitute a temporary revetment. Although a revetment prevents erosion of the land behind it, it does not prevent erosion of the beach in front of it (and in fact may accelerate erosion or material fronting the structure). Therefore, while it would provide good protection against further landward erosion, it is unlikely that any usable beach would form in front of the structure.

Wave runup and overtopping were other factors considered in the evaluation of the revetment alternative. Because the area is subjected to large winter swells, a structure that would completely prevent overtopping would be prohibitively large and expensive. Instead, adequate drainage behind the revetment would need to be incorporated into the design. This would require that the revetment be located farther from the condominium property than the existing sandbag revetment. Fill material would need to be placed behind the revetment to create additional area for drainage and site access (with acceptable slope of revetment face, the toe of structure could be 30 – 50 feet seaward of existing shoreline). Flooding of the park area and Makaha Surfside Apartments could continue to be a problem.

Construction of a revetment would also require significant excavation to key the structure into the shoreline, which could potentially disrupt archaeological sites. Furthermore, a revetment would be a much larger structure than the breakwater as it would rise approximately 10 feet above sea level (to the height of the existing bank) whereas the proposed breakwater rises only 4 feet above sea level.

The breakwater solution has a greater effect in reducing wave runup and overtopping as it reduces the wave energy before reaching the shoreline. In combination with beach nourishment, the breakwater solution will provide a greater level of protection against backshore flooding. It will also result in a protected, usable beach area that would not necessarily exist if a revetment were to be constructed.

4. Enclose and Fill Cove

Since much of the surrounding coastline between Mauna Lahilahi Beach and the Waianae Boat Harbor is hard beach/reef rock backed by relatively large sand deposits, an alternative that would offer maximum protection to inshore property is to close the mouth of the cove and fill the cove with rock, gravel, and/or sand. This is essentially a variation of the revetment alternative described above, with the revetment being constructed across the mouth of the cove. This alternative would give more land area for park use but would limit access to the water by swimmers. As with the revetment alternative, it is possible that no usable beach would form in front of the structure. All marine life in the cove would be covered by fill, which is environmentally unacceptable. Construction cost would be the highest of all the alternatives.

5. Detached Breakwater

A detached breakwater serves a similar purpose as an attached breakwater but allows circulation and wave penetration around both ends of the structure. Detached breakwater alternatives considered included both single-segment as well as multiple-segment

structures. The choice between a detached breakwater and an attached breakwater was based on the design wave direction and the calculated beach shapes for a variety of configurations. The attached breakwater was chosen because it provides the greatest protection along the south end of the beach. This is the area hardest hit by erosion and most prone to wave overtopping. The attached breakwater is also more likely to retain the sand placed for beach nourishment. Lastly, the attached breakwater is less costly to construct and maintain than a detached structure.

6. Attached Breakwater

An attached breakwater is the solution proposed to address the ongoing erosion of the Mauna Lahilahi Beach Park. Such a breakwater could be attached to either of the flanking headlands and is intended to intercept a portion of the incident wave energy and reduce shoreline erosion and backshore flooding. The choice to attach the breakwater to the southern headline was based on calculated beach shapes for a variety of configurations. As shown in Figure 6, the stable beach configuration behind a breakwater attached at the southern end provides the greatest protection to the area most severely impacted by erosion and flooding.

Because of the significant erosion that has already occurred at the site, the attached breakwater is being proposed in combination with beach nourishment. This combination is thought to provide the greatest possible protection against further erosion, while providing and maintaining a usable beach and park area.

D. MITIGATION

A monitoring/mitigation program has been requested by various permitting agencies reviewing this project. The proposed program has been divided into four areas: 1) shoreline monitoring; 2) structure monitoring; 3) biological monitoring; and 4) water quality monitoring.

The primary objectives of the monitoring plan are as follows: to document and assess project performance to determine how well it fulfills the protection requirements for which it was designed; to identify maintenance and renourishment requirements; and to evaluate project impacts.

The monitoring plan is still being finalized, but is likely to consist of the following components:

- Shoreline Monitoring – beach profiles and sediment samples will be taken within the project area and along the main Mauna Lahilahi beach to the north of the project site. The purpose of the shoreline monitoring is to evaluate the effectiveness of the structure in retaining the beach nourishment sand and to determine the impacts, if any, to surrounding beaches.
- Structure Monitoring – inspections of the breakwater will be made to determine its condition, adequacy to serve its intended purpose, and rehabilitation work required, if any.
- Biological Monitoring – coral and algae populations will be assessed by surveys of permanent quadrants located inside and outside the cove and on the breakwater structure. Algae samples from the site will also be examined for the presence of ciguatera.
- Water Quality Monitoring – water quality samples will be collected before, during and after construction as required by Dept. of Health 401 WQC Best Management Practices/Water Quality Monitoring Plan.

V. DETERMINATION, FINDINGS, AND REASONS FOR SUPPORTING DETERMINATION

Based on the information contained in this document, the determination for the proposed action is a Finding of No Significant Impact (FONSI). When a FONSI is issued, a project may proceed without further study. In making a FONSI determination certain "significance criteria" has been established. An action shall be determined to have a significant effect to the environment if it meets any of the following criteria:

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

The proposed breakwater will cover a portion of the underwater habitat. While a portion of this habitat will be lost, the boulders and rocks used for construction of the breakwater will actually increase marine biodiversity by creating additional habitat in the flat and barren reef surface areas. Cultural or historic resources are not anticipated to be significantly impacted by the proposed project.

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

The existing shoreline is rocky and dangerous for swimmers and beachgoers. The creation of a sandy beach and partially sheltered cove will create recreational opportunities for swimmers and beach users. Fishing activities may also be enhanced.

(3) Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;

The proposed project is consistent with Hawaii's State Environmental Policy as established in Chapter 344, Hawaii Revised Statutes (HRS) to encourage conservation of natural resources and the quality of life. The proposed project is consistent with the goals of HRS 344-4(4) to preserve and maintain park and recreation areas for public recreational uses.

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

The proposed project will have a positive impact on the economic and social welfare of the community and state by improving the beach at Mauna Lahilahi. In addition to improving and preserving the beach for recreational use, the project will reduce the threat to property damage by wave-induced flooding.

(5) Substantially affects public health;

As noted in Chapter IV, Sections A and B of this report, the project will have some impacts on air, noise, and water quality. However, these impacts will be limited to the construction period of the project and are not anticipated to substantially affect public health.

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

The proposed improvements at Mauna Lahilahi beach are anticipated to increase park usage, which is consistent with the goals of HRS 344-4. These changes are not anticipated to have a significant impact on existing public facilities.

(7) Involves a substantial degradation of environmental quality;

The proposed project is not anticipated to have any significant negative direct, indirect, or cumulative impacts to environmental quality. The anticipated environmental impacts of the proposed project are described in more detail in Section IV of this report.

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

The project is not anticipated to have cumulative negative impacts or involve a commitment for significant larger actions. Periodic inspection and maintenance are recommended for all breakwaters, particularly after hurricanes or large storms.

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

No rare, threatened, or endangered species or habitats exist in the project area. It is likely that green sea turtles (*chelonia mydas*) and rarely Hawaiian Monk Seals forage within the cove. During construction, the contractor should be aware of the presence of any monk seals or turtles in the area. If protected species are seen then any potentially dangerous construction activities should be halted.

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

As noted in Chapter IV Section A, impacts on air, water quality, and noise are not anticipated to be significant and will be limited to the construction period.

(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 proposed scheme is not designed to reduce damage caused to existing structures during a rare event such as a tsunami or hurricane. As the purpose of the structure is to absorb wave energy, the breakwater itself could possibly sustain damage during an extreme event (hurricane or tsunami). Designing the breakwater to sustain no damage during such rare and extreme events is not practical.

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

The project will have no significant negative impacts on scenic vistas and view planes identified in county or state plans or studies. Visual impacts are addressed in more detail in Chapter IV Section B of this report.

(13) Requires substantial energy consumption.

Construction of the proposed project will not require substantial energy consumption

relative to other similar projects.

(14) Consistency with the General Plan of the City and County of Honolulu, 1992 Edition.

Chapter III: Natural Environment, Objective B, Policy 4; Provide opportunities for recreational and educational use and physical contact with Oahu's natural environment.

Chapter X: Culture and Recreation, Objective D, Policy 6; Provide convenient access to all beaches and inland recreation areas.

Chapter X: Culture and Recreation, Objective D, Policy 12; Provide for safe and secure use of public parks, beaches, and recreation facilities.

The existing eroded shoreline is rocky and dangerous for swimmers and beachgoers. Furthermore, the ongoing erosion is threatening to cut off access between the northern and southern portions of the beach park. The proposed breakwater project will provide a sheltered, usable beach area in addition to providing the necessary protection against erosion. This will provide safer and more convenient access to the beach and public park land in this area.

VI. AGENCIES, ORGANIZATIONS AND INDIVIDUALS CONSULTED IN THE PREPARATION OF THE FINAL EA

As part of the preparation of the Draft Environmental Assessment the following agencies, organizations, and individuals were consulted.

Federal

- Department of the Army - Pacific Ocean Division
- United States Fish and Wildlife Service
- United States National Marine Fisheries Service
- United States Environmental Protection Agency

State Agencies

- Department of Land & Natural Resources
  - Land Division
  - State Historic Preservations Office
  - Division of Aquatic Resources
- Department of Health
  - Clean Water Branch
- State of Hawaii Department of Business, Economic Development, and Tourism
  - Coastal Zone Management Program

City and County of Honolulu

- Department of Parks and Recreation
- Department of Planning and Permitting
- Department of Design and Construction

Others

- Makaha Surfside AOAO
- Waianae Neighborhood Board No. 24
- Mr. Lucio Badayos
- Mr. Alika Silva
- Mr. Glen Kila
- Mr. Clarence De Lude

VII. REFERENCES

AM Partner, Inc. and Environmental Communications, Inc. Draft Environmental Assessment for Mauna Lahilahi Beach Park Improvements. Prepared for City and County of Honolulu, Dept. of Parks & Recreation, June 2000.

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Sea Engineering. Measurement of Coastal Currents, Waianae, Oahu. Prepared for M&E Pacific, Inc. May 1980.

Wilson Okamoto & Associates. Conservation District Use Application Namahana Farms Water Systems Improvements. Prepared for Namahana Farms, Inc. February 1991.

APPENDIX A: Miscellaneous Maps and Figures

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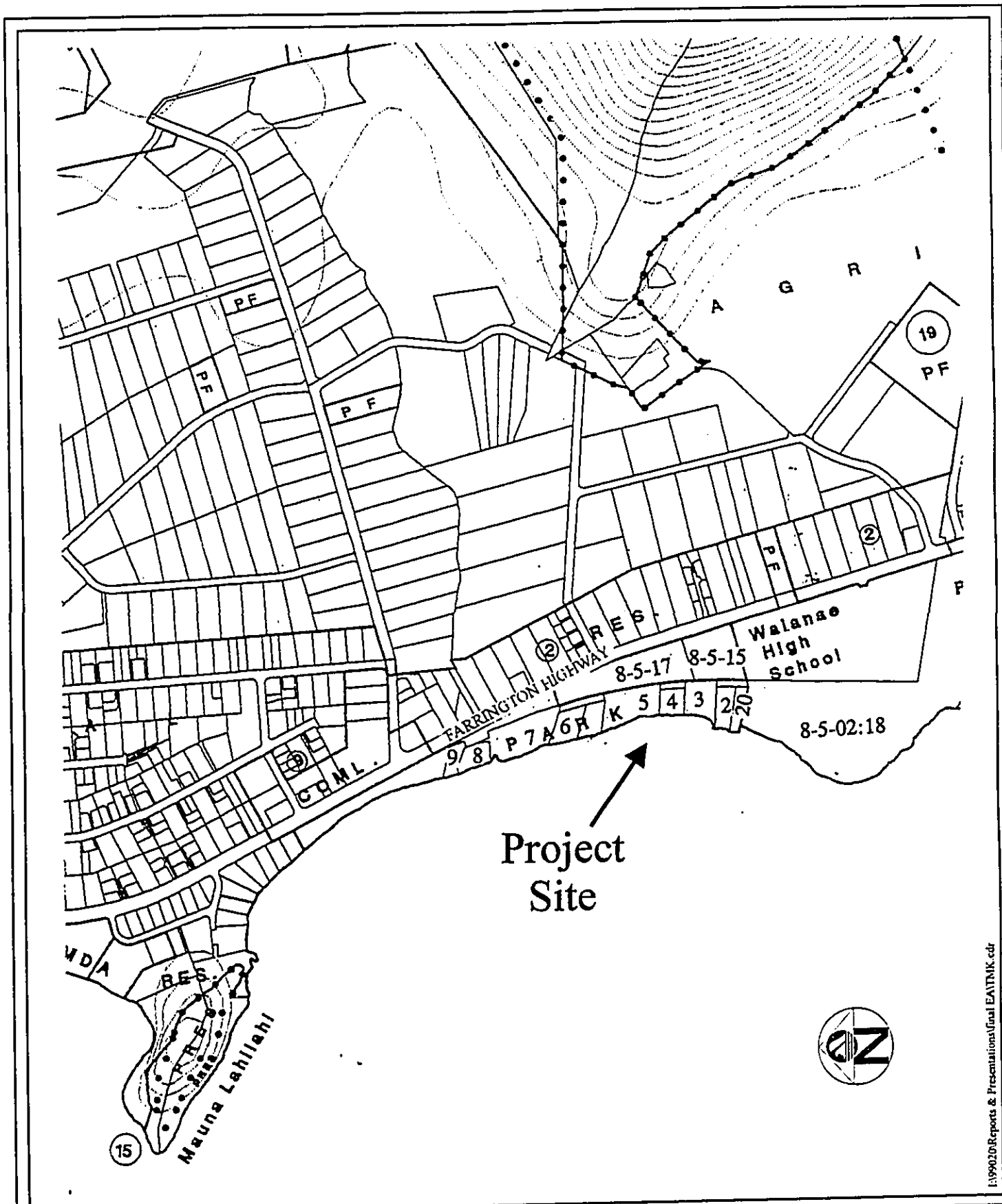

TAX MAP KEY/DEVELOPEMENT PLAN MAP

MAUNA LAHILAHI BEACH PARK

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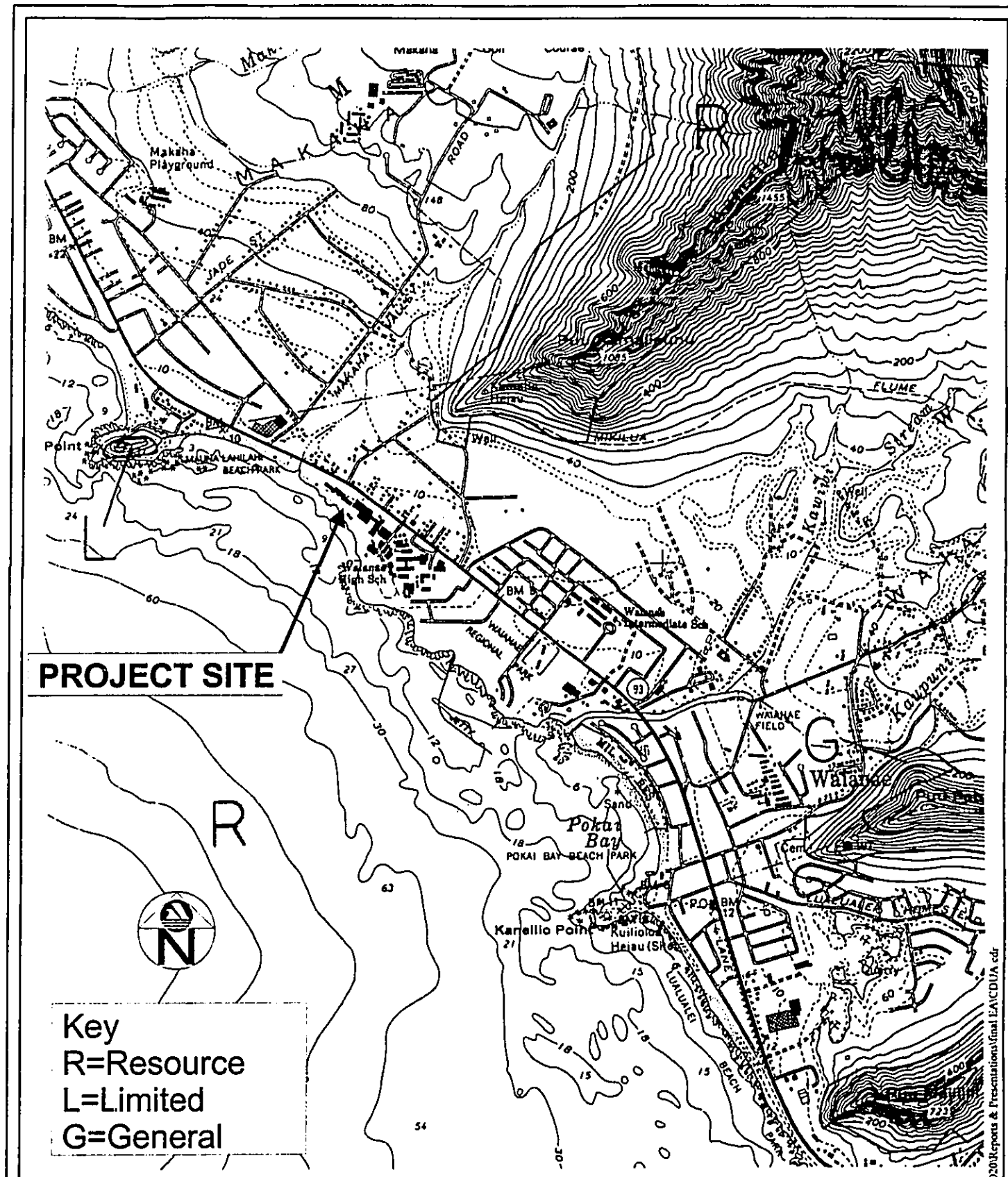

CONSERVATION DISTRICT USE MAP

MAUNA LAHILAHI BEACH PARK

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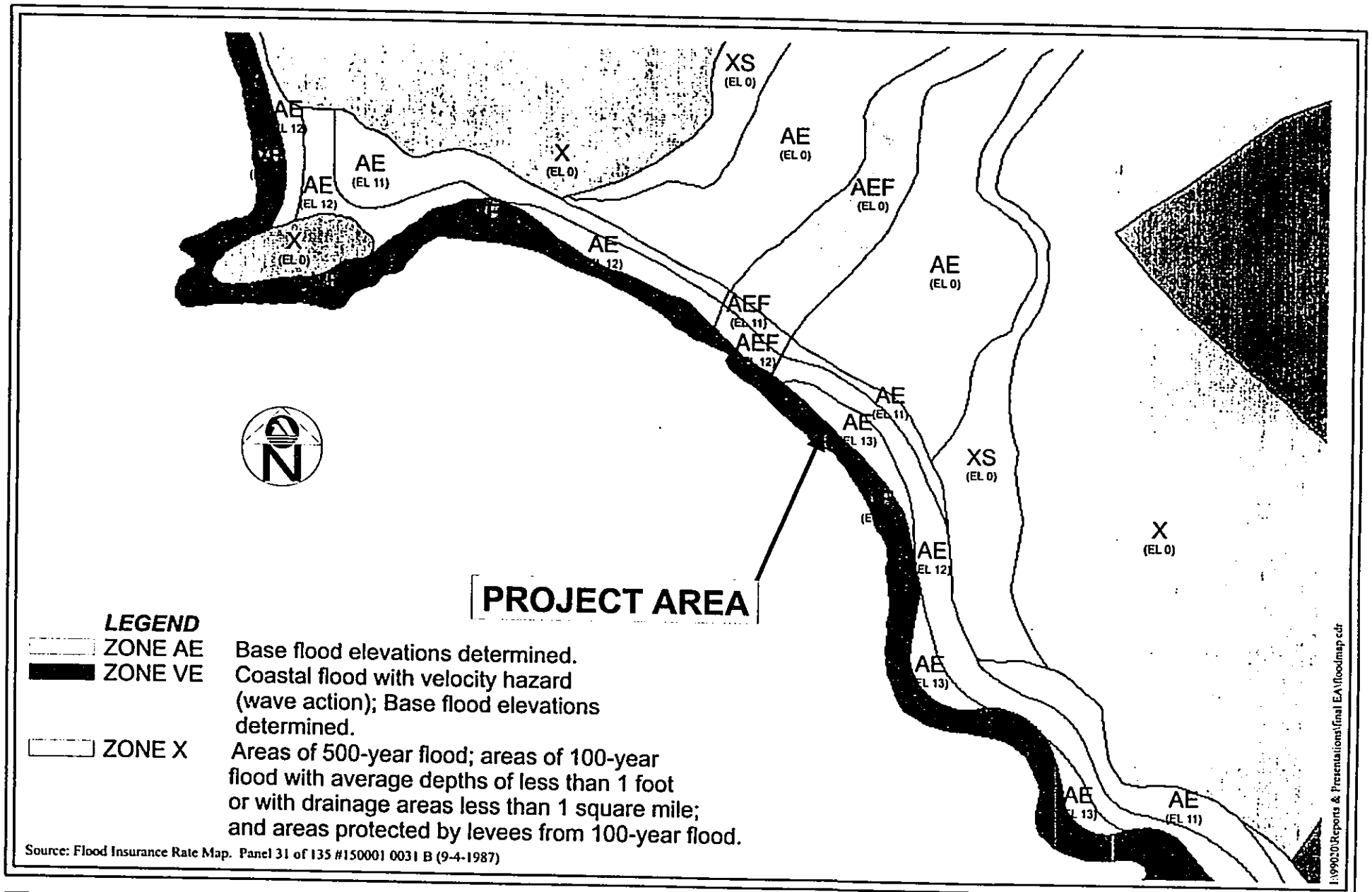

FLOOD INSURANCE RATE MAP

MAUNA LAHILAHI BEACH PARK

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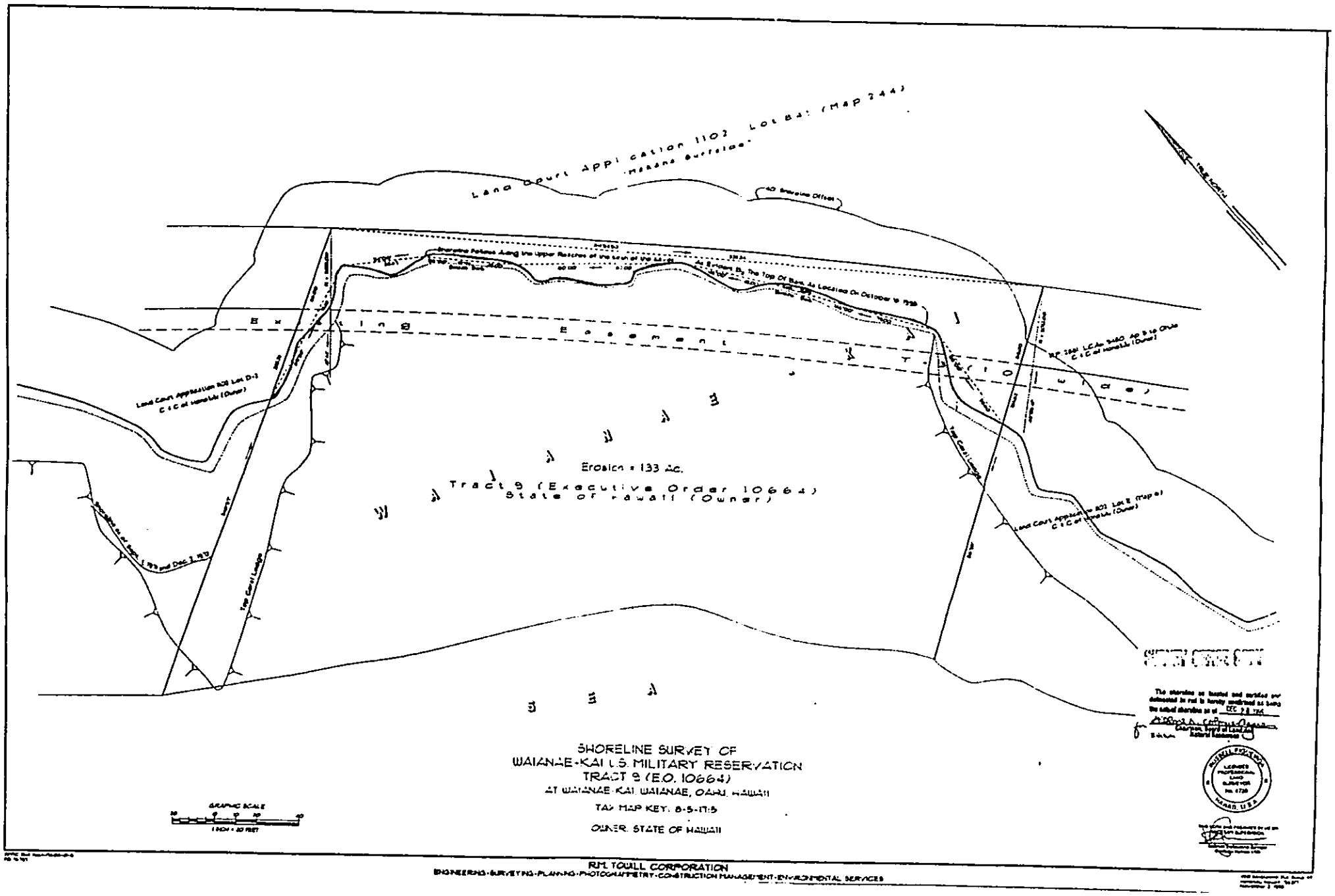


SHORELINE SURVEY OF
WAIANAE-KAI U.S. MILITARY RESERVATION
TRACT 9 (E.O. 10664)
AT WAIANAE-KAI, WAIANAE, OAHU, HAWAII

TAX MAP KEY: 8-5-17:5

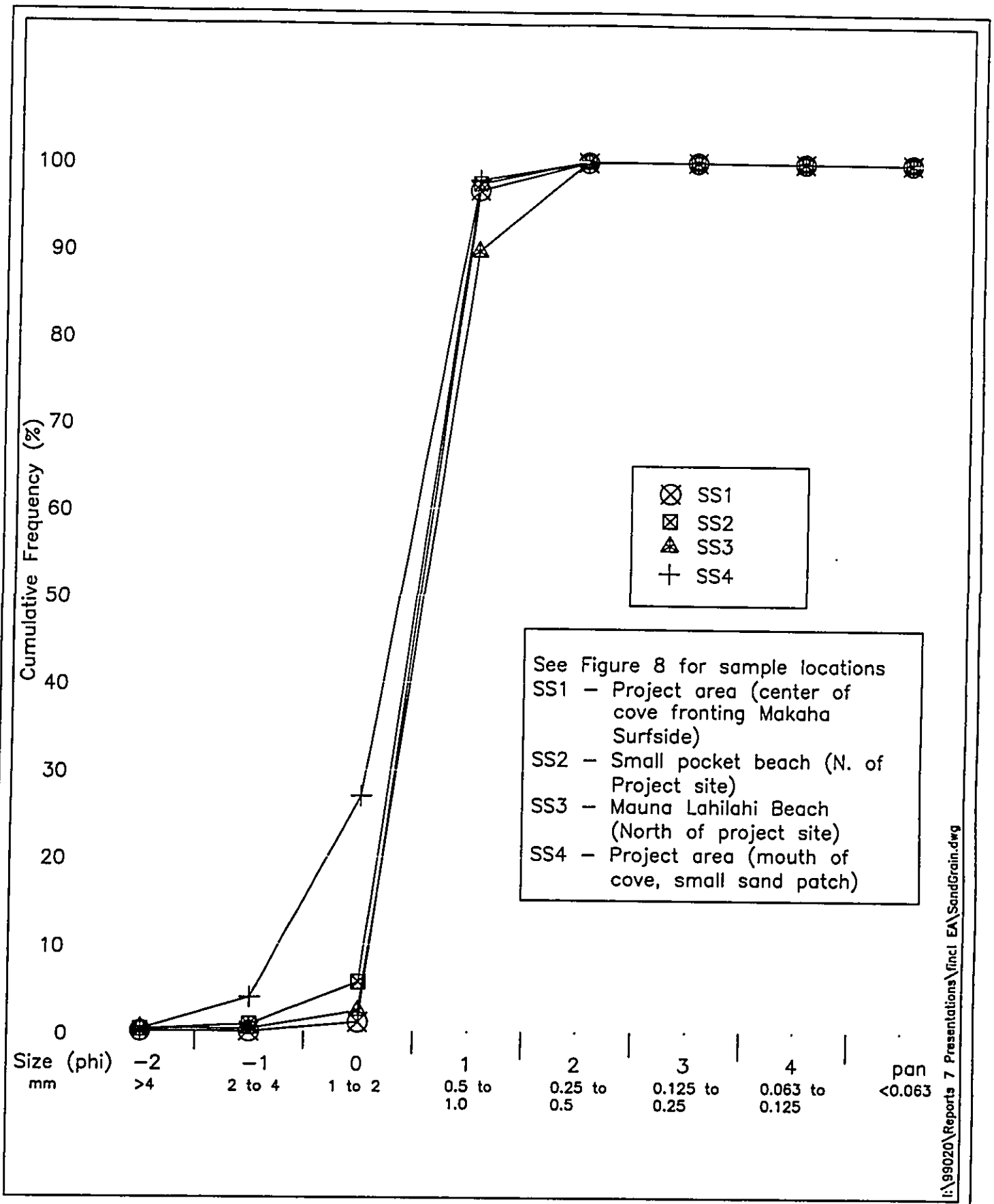
OWNER: STATE OF HAWAII

The shoreline as located and verified and delineated in red is hereby confirmed as being the actual shoreline as of DEC 2 8 1984

Chairman, Board of Land and Natural Resources

STATE OF HAWAII
LICENSED PROFESSIONAL LAND SURVEYOR
No. 4736

RM TOUILL CORPORATION
ENGINEERING · SURVEYING · PLANNING · PHOTOGRAMMETRY · CONSTRUCTION MANAGEMENT · ENVIRONMENTAL SERVICES



GRAIN SIZE ANALYSIS

MAUNA LAHILAHI BEACH PARK

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APPENDIX B: Draft EA Comments and Responses

Oceanit.
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DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET • HONOLULU, HAWAII 96813
TELEPHONE: (808) 523-4414 • FAX (808) 527-6743 • INTERNET: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

LORETTA K.C CHEE
DEPUTY DIRECTOR

(RY)

September 15, 2000

Mr. Ian Wasnich
Oceanit Laboratory
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Wasnich:

Subject: *Draft Environmental Assessment* for Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu
Tax Map Key 8-5-17: 4, 6, and 7

Thank you for the opportunity to comment on the subject Draft Environmental Assessment (DEA). We provide the following:

1. The final EA should include a copy of the certified shoreline survey.

2. Work and structures that are located within the 40-foot shoreline setback area is subject to the requirements of Chapter 23, Revised Ordinances of Honolulu and will likely require a shoreline setback variance.

3. Work and structures, if any, that are landward of the shoreline are within the Special Management Area are subject to the requirements of Chapter 25, ROH. A Special Management Area Use Permit may be required.

4. Page 28 of the DEA states that salt tolerant vegetation will be planted at the top of the beach to help minimize further erosion. The final EA should discuss how these plants will be established. Will an irrigation system be provided?

5. The final EA should provide a discussion of construction activities. This section should elaborate on truck deliveries and construction equipment access, stockpiling/staging for construction material.

6. The applicant should provide a short discussion in Section V (Determination, Findings and Reasons for Supporting Determination), of how this project is consistent with the General Plan of the City and County of Honolulu, 1992 Edition, specifically Policy 4 ("Provide opportunities for recreational ... use...Oahu's natural environment) of Objective B of the Natural Environment Chapter III and Policies 6 ("Provide convenient access to all beaches ...) and 12 ("Provide for safe and secure use of public parks, beaches ...") of Objective D of the Culture and Recreation Chapter X.

7. Upon completion, the expanded beach will not be easily visible or accessible since it is located directly behind the Makaha Surfside Apartments. The breakwater will provide protected shoreside conditions that may be more desirable for small children. To provide better public access, we suggest that signage be erected and a paved path be constructed from the nearest public parking area.

If you have any questions, please contact Raymond Young at 527-5839.

Sincerely yours,

RANDALL K. FUJIKI, AIA
Director of Planning and Permitting

RKF:lh

50128

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 523-4564 Fax: (808) 523-4567
Website: www.co.honolulu.hi.us

JEREMY HARRIS
MAYOR

RAE M. LOUI, P. E.
DIRECTOR

GEORGE T. TAMASHIRO, P. E.
DEPUTY DIRECTOR

ERIC G. CRISPIN, AIA
ASSISTANT DIRECTOR

May 31, 2001

TO: RANDALL K. FUJIKI, AIA, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: RAE M. LOUI, P. E., DIRECTOR

SUBJECT: RESPONSE TO COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED SHORE PROTECTION AT MAUNA LAHILAHI BEACH PARK, WAIANAE, OAHU
TAX MAP KEY 8-5-17: 4, 6, & 7

Thank you for your comments of September 15, 2000 on the subject draft environmental assessment (EA). The following are responses to your comments:

The December 28, 1995 certified shoreline is included in Appendix A (page 40) of the draft EA. This map was digitized from a certified shoreline map with the State Survey Office's seal of approval. The final EA will include a copy of the original certified shoreline map. A new certified shoreline has not been surveyed because the proposed project is seaward of the 1995 shoreline and does not extend into the setback area.

Construction activities, including stockpiling and staging, will only involve temporary use of lands within the 40-foot shoreline setback area, and therefore, do not constitute development. A letter from the Department of Planning and Permitting dated December 13, 2000 verifies that a Shoreline Setback Variance will not be required

The proposed breakwater and sand nourishment will not be placed within the SMA. A letter from the Department of Planning and Permitting dated December 13, 2000 verifies that a Special Management Area Use Permit will not be required.

Currently, *Naupaka* grows along portions of the fence bordering the Makaha Surfside Apartments. Another project, the Mauna Lahilahi Beach Park Improvements, proposes new landscaping for the entire park, a new comfort station, and new parking facilities. A draft EA for this work was prepared by AM Partners, Inc. and Environmental Communications, Inc., and it

describes in greater detail the proposed landscape improvements for the entire Mauna Lahilahi Beach Park. References to vegetation in the final EA will be modified to clarify the distinction between the shoreline protection project and the proposed park improvements project.

The construction plans and specifications specifically require the contractor to submit a plan for site access, erosion control, and protection of archaeological resources. The plan will need to be approved by the officer-in-charge and the State Historic Preservation Division, Department of Land and Natural Resources. To the extent that they have been determined at the time of publication, the final EA will provide a discussion of construction activities, including truck deliveries, construction equipment access, and stockpiling and staging for construction material.

The final EA will include a discussion of how this project is consistent with the General Plan of the City and County of Honolulu, 1972 Edition, specifically Policy 4 of Objective B and Policies 6 and 12 of Objective D.

Signage and paved pathways are not a portion of this erosion control project. The above referenced draft EA for Mauna Lahilahi Beach Park Improvements proposes new footpaths in the vicinity of the project and may at least partially address your concerns.

Please contact Mr. Donald Griffin at extension 6324 if you have any questions.

RML:ei

✓ cc: Mr. Ian Wasnich, Oceanit Laboratories, Inc.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

August 25, 2000

LD-NAV

Ref.: DEALAHILAHIBP.RCM

Honorable Gary Q. L. Yee, Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Yee:

SUBJECT: Draft Environmental Assessment for Mauna Lahilahi Beach Park, Waianae, Island of Oahu, Hawaii

Thank you for the opportunity to review and comment on the subject matter.

Attached herewith is a copy of our Land Division Planning and Technical Services comment related to delivery and placement of sand for the proposed project, Conservation District Use Permit (CDUP) and easement for the breakwater. Our contact person for the CDUP and easement application is Mr. Sam Lemmo at 587-0377 and Ms. Charlene Unoki at 587-0433, respectively.

The Department has no other comment to offer on the subject matter at this time. Should you have any questions, please feel free to contact Nicholas Vaccaro of the Land Division's Support Services Branch at 808-587-0438.

Very truly yours,

DEAN Y. UCHIDA
Administrator

C: Oahu District Land Office

8/29
15

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND DIVISION
STATE PARKS
WATER RESOURCE MANAGEMENT

AUG 25 2000

MEMORANDUM:

TO: Nick Vaccaro, Land Agent
Land Division

FROM: Sam Lemmo, Senior Staff Planner
Land Division

SUBJECT: Draft Environmental Assessment for Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu

I have reviewed the draft environmental assessment (DEA) for the above-mentioned project and have the following comments.

In terms of coastal processes, there was a study done for the Army Corps, by Sea Engineering, Inc. in the 1990s. This report was done to assess the impact, if any, on shoreline erosion at the North end of Lahilahi Beach due to the presence of the Waianae Small Boat Harbor. That report derives some conclusions about sand transport in the vicinity of Mauna Lahilahi Beach. The DEA does not reference this report. This report should be included and analyzed in the EA.

In terms of sand, the silt content threshold is too high (15percent). We are looking at 6 to 9 percent as an acceptable standard for Hawaii's beaches. Also, potential sand sources are mentioned. The two are crushed coral from Barber's Point and sand obtained from Glover. The Department would probably object to the use of crushed coral for sand nourishment based on our knowledge of its use in other areas such as Fort DeRussy.

An approved sand source needs to be identified for the project. Prices and delivery methods need to be negotiated during the planning phase. In too many cases, the sand nourishment component of projects is an after thought. As the extraction, delivery and placement of sand can be complicated, it is vital that logistics/prices are dealt with up front. Failure to do so can result in project delays, change orders, etc. These issues must be resolved prior to the issuance of design and construction contracts.

The Department is in general agreement with the proposed breakwater solution. Our main concerns are 1) potential down drift impacts as a result of a new coastal structure, 2) having a viable sand source at the earliest stage possible, and 3) the configuration of the breakwater. As such, we recommend 1) that the aforementioned Sea Engineering report is reviewed by the project consultant, 2) that a high quality sand source is found as early as possible and 3) that people understand that the breakwater configuration illustrated in the DEA is subject to further modification/refinement based on further project review.

Finally, we note that while the Department of Land and Natural resources is not the accepting authority for the EA, the applicant must still file a Conservation District Use Application and easement request for the breakwater. This will allow for additional expect review and community input when the time comes.

Cc: Chairperson
Oahu District Board Member
Oahu District Land Agent
Dean Uchida

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
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GEORGE T. TAMASHIRO, P. E.
DEPUTY DIRECTOR

ERIC G. CRISPIN, AIA
ASSISTANT DIRECTOR

May 31, 2000

Mr. Dean Y. Uchida, Administrator
Land Division
Department of Land and Natural Resources
State of Hawaii
Post Office Box 621
Honolulu, Hawaii 96809

Dear Mr. Uchida:

Subject: Response to Comments on the Draft Environmental Assessment for the Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu
Tax Map Key 8-5-17: 4, 6, and 7

Thank you for your comments of August 25, 2000 on the subject draft environmental assessment (EA). The following are responses to your comments:

The Lahilahi Beach Shoreline Erosion Study for the U.S. Army Corps of Engineers prepared by Sea Engineering in December 1997 has been reviewed and will be referenced in the final EA.

Your comment requiring an approved sand source of acceptable silt content is noted and is also a key issue in the approval of the Conservation District Use Permit for the project. A sample of sand available from Jas W. Glover, Ltd. on Kauai was previously sent to Mr. Sam Lemmo. This sand was approved for use on Brennecke Beach on Kauai. The Glover sand contains approximately 1 percent silt (.074 mm). Should the selected construction contractor propose to use a different sand source, a sample will be provided to the Department of Land and Natural Resources for approval.

The potential impact to surrounding beaches was a key factor in the design and configuration of the proposed breakwater (along with impacts to archaeological, historical, and marine resources). Specifically, the orientation of the tip of the structure was selected to minimize impacts to the stretch of sandy beach just north of the project site. All shoreline south of the project site to the Waianae Boat Harbor is hardened by natural rock. Our consultant does

not expect littoral and offshore currents in the project area to be affected due to the relatively small size of the structure as well as its location within the eroded cove. A more detailed discussion of these issues will be incorporated into the final EA.

If you have any questions, please contact Mr. Donald Griffin 527-6324.

Very truly yours,

RAE M. LOUI, P. E.
Director

RML:ei

cc: Mr. Ian Wasnich, Oceanit Laboratories, Inc.

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
2550 Campus Road • Crawford 317 • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

September 7, 2000
EA: 1207

Mr. Don Griffin
City and County of Honolulu
Department of Design and Construction
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Griffin:

Mauna Lahi Lahi Beach Park Shoreline Protection
Draft Environmental Assessment
Waianae, Oahu

The Department of Design and Construction proposes construction of an offshore connected breakwater coupled with beach nourishment of 5,000 cubic yards of sand at the southern end of Mauna Lahi Lahi Beach Park, fronting the Makaha Surfside Apartments. The purpose of the project is to protect the shoreline from erosion. Specifically, the breakwater is designed to reduce wave energy and resulting landward erosion, to retain sand in a stable beach configuration, and to maintain adequate water circulation. The beach nourishment is intended to restore the beach. This review was conducted with the assistance of Charles Fletcher, Geology and Geophysics; and Sherri Hiraoka, Environmental Center.

General Comments

The project serves a useful purpose in attempting to reduce/prevent erosion of the shoreline at a beach park. We would note, however, that the primary reason for the project is not to provide an increased beach area for Mauna Lahi Lahi Beach Park users, but to protect the private property of the Makaha Surfside Apartments, and question the paying for such a project with public funds.

We acknowledge the attempts of the consultant to include such additional information as wave mechanics and past shoreline conditions in the Environmental Assessment (EA). This is very helpful in allowing the public to appropriately assess the conditions in the area, as well as the merits of the proposed project.

Breakwater

Our reviewers suggest that the proposed offshore breakwater is not the optimal choice of alternatives. It represents the majority of the $800,000 construction expense as well as it opens the City up to potential liability.

The United States Federal Emergency Management Agency and the United Stated Army Corps of Engineers both report much damage caused by large boulders suspended in the water that act as battering rams into coastal dwellings during hurricane storm surges. This suggests the possibility off the proposed breakwater turning into such "battering rams" with the next hurricane that hits that coastline. With this possibility, the City is opening itself up to tremendous liability by permitting and paying for an offshore breakwater immediately makai of a multi-unit, multi-story apartment complex.

The statement on page 28 that "The breakwater will reduce erosion within the project area. Because the project includes beach nourishment, it is not anticipated to exacerbate erosion on adjacent shorelines." This statement seems to imply that the breakwater will create water circulation that differs from the current patterns. Erosion at adjacent shoreline areas seems to be promoted by this breakwater in the absence of beach sand at the Makaha Surfside site. What are these altered circulation patterns and how are the adjacent sites expected to be impacted? Why will the nourished beach prevent adjacent erosion? If sand is eroded away from the nourished site, at what point would it affect the neighboring shorelines?

Beach Nourishment

Instead of the proposed breakwater/beach nourishment plan, we would suggest consideration of a larger beach nourishment alternative. A new state program is in place that offers general permits for a maximum amount of 10,000 cubic yards of sand. If the sand quantities were maximized, it would provide the benefits of a lower cost from hundreds of thousands of dollars to tens of thousands, allow for a wider beach for users, be simpler, be more benign, and an environmentally compatible.

Stabilizing the shoreline with sand will at least temporarily stop erosion. It is likely that the sand will continue to erode and that renourishment will be necessary at a later date but it is not certain. If the beach is used to counter erosion trends, we may learn about the rate of erosion and the processes acting on the beach through monitoring of the response of the beach sand over the next few months and years. This encourages long-term maintenance of the beach infrastructure of the park and removes the City of the liability of the breakwater breaking apart during a hurricane.

Fragmentation and Cumulative Impacts

The project in included within the Mauna Lahi Lahi Beach Park, where the Department of Design and Construction has submitted a separate EA on a Beach Park Improvement Project. No references to this improvement project are made in this EA.

The Hawaii Administrative Rules, § 11-200-7 state that a group of actions proposed by an agency or an applicant shall be treated as a single action when: (1) The component actions are phases or increments of a larger total undertaking." The shoreline protection project easily qualifies as a phase of the larger project of improving the safety and recreational quality of the Mauna Lahi Lahi Beach Park. Therefore, the shoreline protection project should be included with the Mauna Lahi Lahi Beach Park Master Plan, in one comprehensive document.

Conclusion

The project site at Mauna Lahi Lahi Beach Park is in need of some effort to stabilize the beach from erosive forces. Instead of the proposed breakwater and nourishment option, we recommend examination of an alternative that consists of beach nourishment with 10,000 cubic yards of sand, along with a monitoring program. This alternative will cost less, increase the beach area for users, provide opportunities to learn about the coastal processes in the area, promote long-term stewardship of the beach, and remove the City from the potential liability from damage caused by the breakwater boulders. Additionally, this project should be included with the Mauna Lahi Lahi Beach Park Improvement project in a comprehensive document that covers all proposed actions to Mauna Lahi Lahi Beach Park in their entirety.

Thank you for the opportunity to comment on this Draft Environmental Assessment.

Sincerely,

Peter Rappa
Environmental Review Coordinator

cc: Jan Wasnich, Oceanit
OEQC
James Moncur, Water Resources Research Center
Charles Fletcher, Geology and Geophysics
Sherri Hiraoka, Environmental Center

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DIRECTOR

GEORGE T. TAMASHIRO, P. E.
DEPUTY DIRECTOR

ERIC G. CRISPIN, AIA
ASSISTANT DIRECTOR

May 31, 2001

Mr. Peter Rappa
Environmental Review Coordinator
Environmental Center
University of Hawaii at Manoa
2550 Campus Road, Crawford 917
Honolulu, Hawaii 96822

Dear Mr. Rappa:

Subject: Response to Comments on the Draft Environmental Assessment for the Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu Tax Map Key 8-5-17: 4, 6, and 7

Thank you for your comments of September 7, 2000 on the subject draft environmental assessment (EA). The following are responses to your comments:

General Comments: The comment letter is correct in noting that the purpose of the proposed project is to reduce erosion along the southeastern shoreline of Mauna Lahilahi Beach Park. The comment letter also correctly notes that the project will help protect the private property of the Makaha Surfside Apartments. However, the project will also serve an equally important task of preserving public shoreline access along Mauna Lahilahi Beach Park. If no action is taken, shoreline access to the southeastern end of the park will be restricted due to erosion. Access along the shoreline corridor is utilized primarily by fishermen, Waianae High School students, and residents of the area. If erosion is allowed to continue, public shoreline access along this corridor would become very dangerous as it would require climbing up and down a 5- to 10-foot escarpment and crossing a shoreline area exposed to sharp coral outcroppings, slippery rocks, and high wave energy.

Breakwater: The design of the structure follows the U.S. Army Corps of Engineers' accepted methods, and the armor rock sizing was chosen specifically to create a stable structure. While the structure is not designed to prevent shoreline flooding during a hurricane, our consultant (Oceanit Laboratories, Inc.) feels that the lack of any protective structure would be an even more undesirable alternative. A visit to the site will reveal that the currently eroding

limestone bench is being broken into rocks of various sizes that litter the project area. Without protection against wave energy, our consultant feels that these natural rocks and debris would be a more likely threat to the apartments during an extreme storm or hurricane event.

The Makaha Surfside Apartments suffered extensive wave and flood damage during both Hurricanes Iwa and Iniki at a cost of nearly $1 million each time. However, in discussions with our consultant, none of the residents have mentioned any damage from stones being washed in by the waves even though the shoreline contains large numbers of stones from gravel size to boulders. It is our consultant's opinion that a hurricane large enough to throw 2.5-ton armor stones at the apartments would destroy the building by wind and wave action alone.

The statement on page 28, "Because the project includes beach nourishment, it is not anticipated to exacerbate erosion on adjacent shorelines" will be removed from the final EA. The potential impact to surrounding beaches was a key factor in the design and configuration of the proposed breakwater (along with impacts to archaeological, historical, and marine resources). Specifically, the orientation of the tip of the structure was selected to minimize impacts to the stretch of sandy beach to the north of the project site. All shoreline south of the project site to the Waianae Boat Harbor is hardened limestone. Our consultant does not expect littoral and offshore currents in the project area to be affected due to the relatively small size of the structure and its location within the eroded cove. A more detailed discussion of these issues will be incorporated into the final EA.

Beach Nourishment: It is our understanding that the general permit referred to in your letter (for placement of up to 10,000 cubic yards of sand) is still in the preliminary stages and is not in place.

Beach nourishment was seriously considered as a solution for erosion within the project area. However, the placement of sand is not necessarily a low-cost option. Sand sources must be approved by the Department of Land and Natural Resources (DLNR). The only approved source considered to date is on Kauai, and sand from this source is estimated to cost about $70 a ton, delivered. The planned sand quantity of 5,000 cubic yards (~6,300 tons) may, therefore, cost in the vicinity of $440,000. It is the opinion of our consultant that the nourishment sand will be lost without the protection of the breakwater structure and that the nourishment option would only make economical and technical sense if sand of larger grain size and much lower cost was readily available.

Fragmentation and Cumulative Impacts: The proposed shoreline protection project was initiated and evolved completely independent from the Mauna Lahilahi Beach Park Improvements Project (parking lot, landscaping, etc.). The proposed shoreline protection project evolved from an erosion control program financed by the Makaha Surfside AOAO for several years starting in 1996. The AOAO received a State permit to nourish the beach and purchased a small quantity of sand. Since the erosion was on a City and County beach park, the City Council decided that erosion control was the City's responsibility and appropriated funds for a long-term solution that would benefit the park. The initial City project to temporarily protect the eroding

shoreline with sandbags was performed in 1999. The proposed breakwater and beach nourishment will be done in 2001. Neither the AOAO's project nor the planned City shore protection projects are related to the City's master plan or beach park improvement project.

Please call Mr. Donald Griffin at 527-6324 if you have any questions.

Very truly yours,

RAE M. LOUI, P. E.
Director

RML:ei

✓ cc: Mr. Ian Wasnich, Oceanit Laboratories, Inc.

cc: DT
FHO

BENJAMIN J. CAYETANO
GOVERNOR

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

September 8, 2000

Mr. Don Griffin
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813

Dear Mr. Griffin:

We submit the following comments on the July 2000, draft environmental assessment for proposed shore protection at Mauna Lahilahi Beach Park in Makaha, Wai'anae, O'ahu, prepared by Oceanit for the City and County of Honolulu.

1. CUMULATIVE IMPACTS ANALYSIS: The project is one of two projects our Office has received with respect to Mauna Lahilahi Beach park. The other project submitted by the Department of Parks and Recreation is for Mauna Lahilahi Beach Park Improvements (parking lot, etc.). Section 11-200-7 of the Hawai'i Administrative Rules requires that "a group of actions proposed by an agency or an applicant shall be treated as a single action when: (1) [t]he component actions are phases or increments of a larger total undertaking; (2) [a]n individual project is a necessary precedent for a larger project; (3) [a]n individual project represents a commitment to a larger project; or (4) [t]he actions in question are essentially identical and a single statement will adequately address the impacts of each individual action and those of the group of actions as a whole." (Underscoring supplied). While these two projects may have been segmented for budgetary reasons, an analysis of the cumulative effects of the overall project needs to be addressed. Please consult with the Department of Parks and Recreation and include in the final environmental assessment for this project a discussion of the relationship between the park improvements and your proposed shoreline protection scheme, including an analysis of cumulative effects to water quality, air, ground water, historic/cultural resources, flora, fauna, etc., which may arise when both projects are implemented.
2. LANDSCAPING: The environmental assessment for the park improvements prepared by AM Partners Inc., and Environmental Communications Inc., discusses landscaping. We are concerned as to the timing of the landscaping - will this take place after the shoreline protection regime is implemented? Please coordinate with the Department of Parks and Recreation on the phasing and timing of this project.
3. ARCHAEOLOGICAL INVENTORY SURVEY: The environmental assessment for the park improvments prepared by AM Partners Inc., and Environmental Communications Inc., mentions that an archaeological inventory survey will be completed before construction. Because of potential cumulative and indirect effects, this survey must be completed before the submission of the final environmental assessment and notice of determination for this project.
4. CONSULTANTS TO CONTACT: Please consult with Mr. Taeyong Kim, Environmental Communications, telephone (808) 528-4661.

Thank you for the opportunity to comment. If there are any questions, please call Leslie Segundo at (808) 586-4185.

Sincerely,

GENEVIEVE SALMONSON
Director

c: ✓Mr. Ian Wasnich, Oceanit
Mr. Taeyong Kim, Environmental Communications Inc.

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GEORGE T. TAMASHIRO, P. E.
DEPUTY DIRECTOR

ERIC G. CRISPIN, AIA
ASSISTANT DIRECTOR

May 31, 2001

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

Dear Ms. Salmonson:

Subject: Response to Comments on the Draft Environmental Assessment for the Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu
Tax Map Key 8-5-17: 4, 6, and 7

Thank you for your comments of September 8, 2000 on the subject draft environmental assessment (EA). The following are responses to your comments:

The proposed shoreline protection project was initiated and evolved completely independent from the Mauna Lahilahi Beach Park Improvements Project (parking lot, landscaping, etc.). The shore protection project evolved from an erosion control program financed by the Makaha Surfside AOAO for several years starting in 1996. The AOAO received a State permit to nourish the beach and purchased a small quantity of sand.

Since the erosion was on a City and County beach park, the City Council decided that erosion control was the City's responsibility and appropriated funds for a long-term solution that would benefit the park. The initial City project to temporarily protect the eroding shoreline with sandbags was performed in 1999. The proposed breakwater and beach nourishment will be done in 2001.

Neither the AOAO's project nor the planned City shore protection projects are related to the City's master plan and beach park improvement project. Referring specifically to Section 11-200-7 of the Hawaii Administrative Rules, we feel that 1) the project is not a phase or increment of a larger total undertaking; 2) while it would be logical to construct the shoreline protection prior to any landscape improvements to avoid unnecessary damage to vegetation, the shoreline protection is not a necessary precedent for the construction of the park improvements; 3) neither project represents a commitment to the other; and 4) the actions of the two projects are clearly dissimilar.

Furthermore, the proposed shoreline improvements are located seaward of the shoreline, whereas the proposed beach park improvements consists of land-based improvements. Therefore, we feel that the separate discussion of impacts from the two projects is suitable and does not overlook any "cumulative" effects to air and water quality, ground water, etc.

Phasing and timing of the projects will be coordinated to ensure that landscaping will not occur until after the shoreline protection is completed.

Our consultant, Oceanit Laboratories, Inc., has been in verbal and written communication with the State Historic Preservation Division (SHPD) and conducted a site visit with Ms. Sara Collins on September 19, 2000. The SHPD's primary concern is the potential damage to burials known to exist throughout the project area. To address their concerns, construction plans and specifications indicated specifically that the contractor is required to submit a site access and erosion control plan for approval by the engineer. The engineer is to consult with the SHPD on the acceptability of the contractor's plan and act to ensure that all of the SHPD's concerns are addressed.

Plans and specifications for this project clearly indicated that grading or grubbing is not permitted. Archaeologically sensitive areas are to be fenced and maintained free of construction equipment and materials. Soil banks within the project area are required to be stabilized. Upon completion, the contractor will be required to clean up the construction area and ensure that the site is clear of construction-related debris.

It is important to note that the breakwater terminates below the soil bank in an area of hardened limestone and rock; therefore, no excavation is required to key the structure into the existing soil bank. No soil disturbance is expected for the removal of the sandbags and placement of additional beach sand. The completed project should provide significant protection against the ongoing erosion that currently threatens burials and historic sites within the project area.

The final EA will provide additional discussion of the cumulative and indirect impacts to archaeological resources. Environmental Communications will be consulted before submittal of the final EA.

Please contact Mr. Donald Griffin at 527-6324 if you have any questions.

Very truly yours,

RAE M. LOUI, P. E.
Director

RML:ei

cc: Mr. Ian Wasnich, Oceanit Laboratories, Inc.

PHONE (808) 594-1888

FAX (808) 594-1865

Cc: DT
ILO

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

August 23, 2000

Oceanit Laboratories, Inc.
Attn: Mr. Ian Wasnich
1001 Bishop Street
Pacific Tower, Suite 2970
Honolulu, Hawai`i 96813

EIS# 406

Subject: Draft Environmental Assessment for Proposed Shore Protection at Mauna Lahilahi Beach Park , Waianae, Oahu
TMK: 8-5-17:5

Dear Mr. Wasnich,

Thank you for the opportunity to review and comment on the above-referenced DEA. As with any project, the Office of Hawaiian Affairs is concerned that subsurface archaeological, historical and cultural remains may be impacted as well as the cultural integrity of the land.

We have the following comments to offer:

- Effective April 26, 2000, Governor Cayetano signed into law Act 50 requiring a cultural impact statement as part of all environmental assessments. Please include one in your Final EA.

- Your draft states that a human burial site was located on the beach and it is not known if other burials exist at the project site. We would like to see an archaeological survey done for the project site.

- The draft makes the following statement: "Cultural or historic resources are not anticipated to be *significantly* impacted by the proposed project." [Italics added] Please include a mitigation plan to address these impacts.

- The Office of Environmental Quality Control had a copy of a DEA for Mauna Lahilahi Beach Park Improvements. Is your DEA tied in with the beach park project? If so, please forward a copy to OHA.

If you have any questions, please contact Ken R. Salva Cruz, Policy Analyst, at 594-1847.

Sincerely,

Colin C. Kippen, Jr.
Deputy Administrator

cc: Board of Trustees
Dept. of Design & Construction
OEQC
File

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CITY AND COUNTY OF HONOLULU
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RAE M. LOUI, P. E.
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GEORGE T. TAMASHIRO, P. E.
DEPUTY DIRECTOR

ERIC G. CRISPIN, AIA
ASSISTANT DIRECTOR

May 31, 2001

Mr. Colin C. Kippen, Jr.
Deputy Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

Dear Mr. Kippen:

Subject: Response to Comments on the Draft Environmental Assessment for the Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu
Tax Map Key 8-5-17: 4, 6, and 7

Thank you for your comments of August 23, 2000 on the subject draft environmental assessment (EA). The following are responses to your comments:

A cultural impact statement will be included as part of the final EA.

Our consultant, Oceanit Laboratories, Inc., has been in consultation with the State of Hawaii, Department of Land and Natural Resources, State Historic Preservation Division (SHPD). Oceanit and the SHPD went on a field visit of the site to determine potential negative impacts resulting from the proposed project. The SHPD has performed recent archaeological studies in the vicinity of the project area. To address the SHPD's concerns, the construction plans and specifications were modified to specifically require the contractor to submit a plan for site access, erosion control, and protection of archaeological resources. The SHPD will be consulted on the suitability of the contractor's plan, and if necessary, the plan will be modified to satisfy the SHPD.

Furthermore, there is no excavation required for the construction of the shoreline protection, as most of the construction is the in-water placement of rock and sand. Consequently, we feel that impacts to archaeological and historical resources in the area can be avoided.

In addition to the consultation with the SHPD, Oceanit spoke with various groups and individuals including, the Oahu Island Burial Council, Hui Malama I Na Kupuna O Hawaii Nei, Mr. William Aila, Mr. Alika Silva, and Mr. Lucio Badayos. These groups and individuals have been consulted to receive input regarding the location of the burials and the appropriateness of

the project given its physical proximity to sacred lands. As mentioned above, the contractor is required to submit a plan for site access, erosion control, and protection of archaeological resources. We feel this plan will address impacts to cultural and historical resources, if any.

The final EA will also note the need to bless the site prior to any construction activities.

Our shoreline protection project is not directly tied to the beach park improvements project that proposes new landscaping, a comfort station, and parking facilities. The draft EA for that project was prepared by AM Partners, Inc. and Environmental Communications, Inc., and any comments regarding that project would be best addressed by these parties.

Please contact Mr. Donald Griffin at 527-6324 if you have any questions.

Very truly yours,

RAE M. LOUI, P. E.
Director

RML:ei

✓ cc: Mr. Ian Wasnich, Oceanit Laboratories, Inc.

CC: DT
IW

WAIANAE COAST NEIGHBORHOOD BOARD NO. 24

c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

September 7, 2000

City & County of Honolulu
Dept. of Design and Construction
650 South King Street
Honolulu, Hawaii 96813
Attn: Don Griffin

Re: Mauna Lahilahi Beach Park Breakwater

Dear Mr. Griffin:

The Wai'anae Coast Neighborhood Board No. 24 (WCNB24) reviewed the aforementioned Draft Environmental Assessment (DEA) at its' Parks and Recreation Committee meeting, in August, and then at its' regularly scheduled board meeting for September. At the regularly scheduled board meeting, the board *did not* take a position on whether to support the intent of the project or not.

The board unanimously did support a motion to request a public hearing be conducted by the US Army Corps of Engineers to solicit information from the community on this project. You will find attached a copy of that request.

If you have any questions, please contact me at 696-0131.

Sincerely,

Cynthia K. L. Rezentes, Chair
Wai'anae Coast Neighborhood Board No. 24

cc: Neighborhood Commission
Councilmember John DeSoto
Representative Mike Kahikina
Representative Emily Auwae
Senator Colleen Hanabusa

wcnb24ch0007

WAIANAE COAST NEIGHBORHOOD BOARD NO. 24

c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

September 7, 2000

District Engineer
U.S. Army Corps of Engineers
Building 230
Fort Shafter, Hawaii 96858-5440
Attn: Ms. Lolly Silva

Re: Mauna Lahilahi Beach Park Breakwater

Dear Ms. Silva:

The Wai`anae Coast Neighborhood Board No. 24 (WCNB24) reviewed the aforementioned Draft Environmental Assessment (DEA) at its' Parks and Recreation Committee meeting, in August, and then at its' regularly scheduled board meeting for September. At the regularly scheduled board meeting, the board did not take a position on whether to support the intent of the project or not.

The board unanimously (13 ayes - 0 nays - 0 abstentions) did support a motion to request a public hearing be conducted by the US Army Corps of Engineers to solicit information from the community on this project. The Wai`anae Neighborhood Board heard comments from the public regarding its opposition to the breakwater and also had questions regarding other issues, such as who is responsible for this breakwater since the State of Hawaii is the "owner" of submerged lands (managed by the Department of Land and Natural Resources), who will maintain the structure, who has the liability for damage from the structure to any facilities (the beach or the Makaha Surfside Apartments from severe wave/current activity, etc.)?

Therefore, we are requesting a public hearing be conducted regarding this project for these questions to be answered and for a more detailed discussion as to why, when we have heard over the last few years to the contrary, this structure will impede the beach erosion conditions now occurring at this location, without affecting other locations in the near vicinity.

If you have any questions, please contact me at 696-0131.

Sincerely,

Cynthia K. L. Rezentes, Chair
Wai`anae Coast Neighborhood Board No. 24

cc: Neighborhood Commission
Councilmember John DeSoto
Representative Mike Kahikina
Representative Emily Auwae
Senator Colleen Hanabusa
C&C of Honolulu, Dept. of Design and Construction

wcnb24ch0007

DEPARTMENT OF DESIGN AND CONSTRUCTION
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ASSISTANT DIRECTOR

May 31, 2001

Ms. Cynthia K. L. Rezentes, Chair
Waianae Coast Neighborhood Board No. 24
c/o Neighborhood Commission
City Hall, Room 400
Honolulu, Hawaii 96813

Dear Ms. Rezentes:

Subject: Response to Comments on the Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu, Tax Map Key 8-5-17: 4, 6, & 7

Thank you for your comments of September 2, 2000 on the proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu.

Your request for a public hearing by the U.S. Army Corps of Engineers is noted. Should the Corps decide to conduct such a hearing, we will be present to respond to any comments and requests from the community.

Please contact Mr. Donald Griffin at 527-6324 if you have any questions.

Very truly yours,

RAE M. LOUI, P. E.
Director

RML:ei

cc: Mr. Ian Wasnich, Oceanit Laboratories, Inc.

APPENDIX C: Correspondence with State Historic Preservation Division

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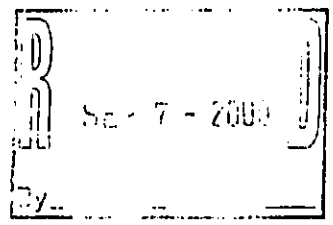
STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

September 1, 2000



Lolly Silva
District Engineer
U. S. Army Corps of Engineer
Building 230
Ft. Shafter, Hawaii 96858-5440

LOG NO: 26121
DOC NO: 0008EJ20

Dear Ms. Silva:

SUBJECT: **National Historic Preservation Act Section 106 Review – City and County of Honolulu, Department of Design and Construction Application for a Department of Army Permit Shore Protection at Mauna Lahilahi Beach Park (File No.200000275)**
Makaha, Wai`anae, O`ahu
TMK: 8-5-17:005

Thank you for the opportunity to comment on the proposed construction of a shore connected breakwater and beach nourishment with approximately 5,000 cubic yards of sand at Mauna Lahilahi Beach Park. Our review is based on historic reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was made of the project areas. We received notification of this undertaking through a public notice from your office on August 23, 2000.

We provided comment on the Environmental Assessment for a CDUA application for the 1999 beach nourishment project. At that time we believed that the beach nourishment actions proposed would have no effect on historic sites and would offer added protection to any burials in the area. We also requested at that time that the EA be corrected to include information that several human burials (Site 50-80-07-4064) have been recovered from the eroding shoreline fronting the Makaha Surfside Apartments. These burials came from two locations – one near the connection of the proposed breakwater to the shore (on the south edge of the Surfside Apartments) and another in front of the north edge of the Surfside Apartments and extending towards Lahilahi along the shore. Since that time, our staff has documented extensive habitation deposits (as well as the earlier known associated burials) along the shore in front of the north side of the Surfside Apartments. These subsurface habitation deposits and associated burials may have once been continuous from the High School towards Mauna Lahilahi. Remnants could even exist in the sand deposits

behind the current sand bagged area. This site (4064) does contain significant information on the history of Wai'anae District and the island of O'ahu, as it fronts the old taro swamp of Kamaile and could have been an early settlement on this side of the island. Thus, it is likely to be significant for its information content (criterion D of the National Register of Historic Places) and for its association with broad patterns of history (criterion A, early settlement of O`ahu's leeward lands), as well as cultural significance associated with the burials (criterion A). Given this information, it is very important to protect this site and the information within it.

The current project proposes that the sand, from the sandbag revetment installed in 1999, be removed from the sandbags and used to nourish the beach and additionally compatible sand be brought in to add to the beach nourishment. We believe that because no new ground disturbance will occur during this activity, this phase of the project will have "no effect" on significant historic sites. (However, as a caution, if the shoreline behind the sandbag revetment is exposed, care must be taken not to damage it or cut it back, as subsurface archaeological deposits might still survive there.)

More importantly, we are concerned that the construction of the breakwater may have an adverse effect on unknown buried archaeological deposits (and associated burials) along the shoreline where the breakwater would attach. We believe that in order to determine the effect the breakwater may have on these sites a qualified archaeologist should be hired to investigate the shoreline in the area proposed for the breakwater connection to the shoreline, to determine whether significant historic sites are in the project area. This would be an archaeological inventory survey of this specific shoreline area. Investigation of existing shoreline exposures for deposits and small test units would be part of this evaluation. This report would document the extent and nature of any archaeological deposit in this area, so the effect of the project on any such deposit can be evaluated. A report of the findings should be submitted to our office, so we can comment on the determination of effect for this phase of the project can be made.

Additionally, we are concerned about access routes for construction equipment, stockpile areas, etc. Again, along the shoreline fronting the north edge of the Surfside Apartments, there is a subsurface habitation deposit with associated burials, which extends an uncertain distance inland. The gate into the beach park enters this area and we have seen construction equipment possibly associated with the sand back revetment project enter through this gate and drive in front of the Surfside Apartments to the revetment area. If this access is to be used by heavy equipment, planning needs to ensure that no adverse effects to the northern habitation deposit occurs. Also, stockpiling of material becomes a very serious concern. Thus, we would need to see access and any stockpiling location plans and effect evaluations.

Thus, at this time, we believe that the effect of this project on historic properties eligible for inclusion on the National Register of Historic Places cannot be evaluated and that adverse effects quite possibly could occur. More information is needed for your agency to conduct Section 106 compliance and for our office to review an effect determination.

Should you have any questions, please feel free to call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha,

TIMOTHY E. JOHNS
State Historic Preservation Officer

EJ:jk

c: City and County of Honolulu, Department of Design and Construction
Oceanit Laboratories, Inc. 1001 Bishop Street, Suite 2970, Honolulu, HI 96813
Dean Uchida, Administrator, Land Division
Kai Markell, SHPD Burials Program

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January 9, 2001

COPY

Mr. Timothy E. Johns
Department of Land and Natural Resources
Historic Preservation Division
Kakuhiewa Building
Room 555
601 Kamokila Boulevard
Kapolei, Hawaii 96707

Subject: **Shore Protection Project. Response to Comments on Application for a Department of the Army Permit for Proposed Shore Protection at Mauna Lahilahi Beach Park, Waianae, Oahu. Tax Map Key 8-5-17: 4, 6, and 7 (Log No. 26121, Doc No. 008EJ20)**

Dear Mr. Johns:

Thank you for providing comments on the subject Department of Army Permit for the Shore Protection at Mauna Lahilahi Beach Park (File No. 200000275). This letter is a follow-up response to written comments by the State Historic Preservation Division (SHPD) to the Army Corps of Engineers (COE) dated September 1, 2000 (Doc No. 0008EJ20), telephone conversations between Oceanit and the SHPD, and a site visit to Mauna Lahilahi Beach Park on Tuesday, September 19, 2000 with Oceanit and SHPD.

Mauna Lahilahi Beach Park is located in Waianae, Oahu. The southeast end of the park is a small pocket beach fronting the Makaha Surfside Apartments (TMK: 8-5-17) (see Figure 1). This pocket beach has undergone severe coastal erosion and since the early 1970's an estimated 35,000 square feet of City and County park land has been lost. Erosion has also resulted in the exposure of human burials (50-80-07-4064).

Purpose of Project

By 1999 erosion had come within 10 feet of the Makaha Surfside property line so the City and County of Honolulu (C&C), Department of Design and Construction (DDC) constructed a temporary sandbag revetment to minimize further erosion. The sandbag revetment was designed as a temporary measure to protect the shoreline until a more permanent solution was found. This project by DDC proposes to construct a permanent shore-connected breakwater and to nourish the beach with approximately 5,000 cubic yards of suitable sand. Figure 2 shows the proposed breakwater and beach nourishment plus the construction

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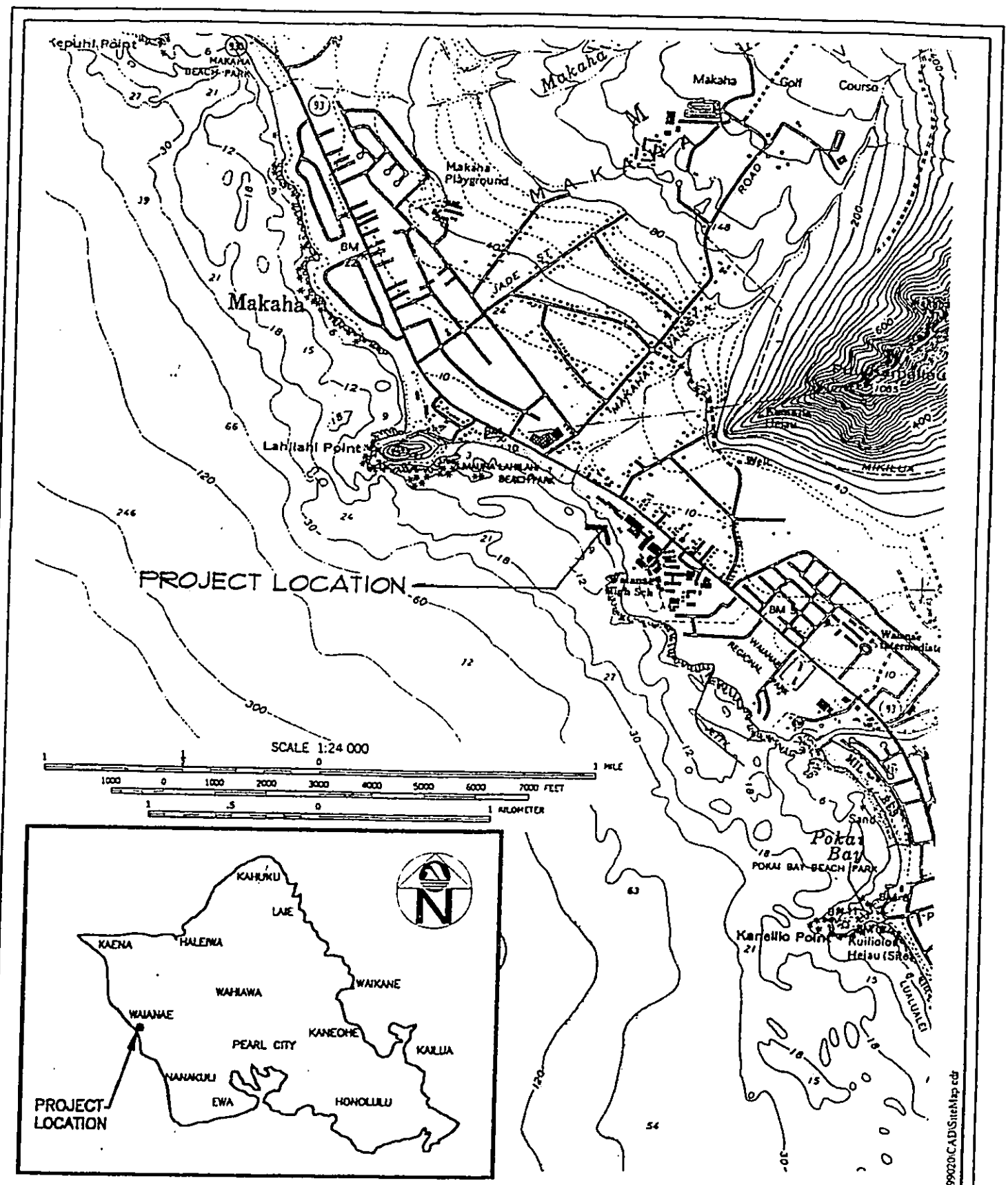

FIGURE 1. SITE LOCATION MAP

MAUNA LAHILAHI BEACH PARK

Oceanit.

mobilization and stockpiling areas. The erosion control scheme will help to stabilize the shoreline and will have a positive impact on cultural/archaeological resources in terms of protecting burials from being unearthed by erosion. The Final Environmental Assessment (FEA) will include information about recent "extensive habitation deposits" along the shore in front of the north side of the Makaha Surfside Apartments. On September 19, 2000, Oceanit met with Ms. Sara Collins of SHPD to discuss the project and potential project impacts to historic or cultural resources.

Ms. Collins requested the identification of potential impacts resulting from construction and proposed mitigation measures. Impacts and mitigation measures from construction are noted below:

Construction Sequence

1. Breakwater Construction

The construction site will be accessed from the northern end of the park and will require passage along the shoreline over the existing temporary sandbag revetment as indicated in Figure 2. Construction plans indicate that the contractor shall stabilize access routes across the sandbags and near the end of the breakwater (see Figure 2). Construction specifications also include the following requirements for the Contractor to submit an overall erosion control plan (Special Provisions, Section 02380-7):

> 3.02 EROSION CONTROL AND PROTECTION OF ARCHAEOLOGICAL/CULTURAL ARTIFACTS
>
> A. Surface Protection
>
> The land area around the breakwater construction site is culturally sensitive. The Contractor shall produce a plan for erosion control and protecting the ground surface during construction operations, site access, stockpiling, or other activities and submit the plan to the Engineer for approval. The protected area includes all ground surface areas and embankments inland from the shoreline rock/coral shelf between Lahilahi Beach and Waianae High School. Existing soil embankments shall not be broken down to provide equipment access. Soil surfaces shall not be graded or grubbed. Fences shall be installed to protect special areas designated on design plans from any disturbance.
>
> B. Discovery of Archaeological/Cultural Artifacts
>
> The Contractor shall notify the Engineer immediately if artifacts or bones are discovered during construction. The Contractor shall stop work in the vicinity of any artifacts until cleared by the Engineer or the State Historic Preservation Office.

Access to the site will be limited to only those vehicles absolutely necessary. Other vehicles shall park in designated parking areas. If permission is obtained, the selected Contractor may also choose to access the site via Waianae High School.

The breakwater will be constructed first and will be built seaward starting from the shoreline. It is important to note that the breakwater terminates below the soil bank in an area of hardened limestone and rock, and therefore no excavation is required to key the structure into the existing soil bank. Consequently, impacts to the soil areas will be limited to those related to stockpiling and construction staging.

Staging areas are confined to the limits of work indicated in Figure 2. As mentioned above, prior to construction, the selected Contractor will submit a plan for erosion control and protection of the ground surface during construction operations, site access, stockpiling, and other activities. The plan will be submitted to the DDC's designated Project Engineer for approval. The Engineer will consult with the State of Hawaii Historic Preservation Division to determine the acceptability of the Contractor's plan. The plan must also address the protection of archaeologically sensitive areas that have also been indicated in the construction plans (see Figure 2). These areas shall be fenced and maintained free of debris and equipment during construction. The Contractor may also be required to utilize mitigation measures such as protective matting over culturally/archaeologically sensitive areas and bank protection mitigation measures.

2. Sandbag Removal

After the breakwater is constructed, the temporary sandbags will be removed and the sand inside of the bags will be left on the beach for beach nourishment. The completed breakwater will provide protection against further wave erosion during the sandbag removal and placement of additional beach nourishment. No ground disturbance is anticipated for this phase of the project.

3. Beach Nourishment

The final step in construction will be the placement of an additional 5,000 cubic yards of clean sand to be used for beach nourishment. No ground disturbance is anticipated during this phase of the project. Upon completion, the breakwater and beach nourishment should provide significant protection against the erosion that currently threatens burials in the project area.

4. Restoration

The contractor will be required to clean up the construction area and ensure that the site is clear of construction-related debris.

The Contractor will be required to comply with the requirements of the permits obtained for the project including the Corps of Engineers 404, State of Hawaii Department of Health 401 Certification, Coastal Zone Management Consistency, and State of Hawaii Department of Land and Natural Resources Conservation District Use Permit.

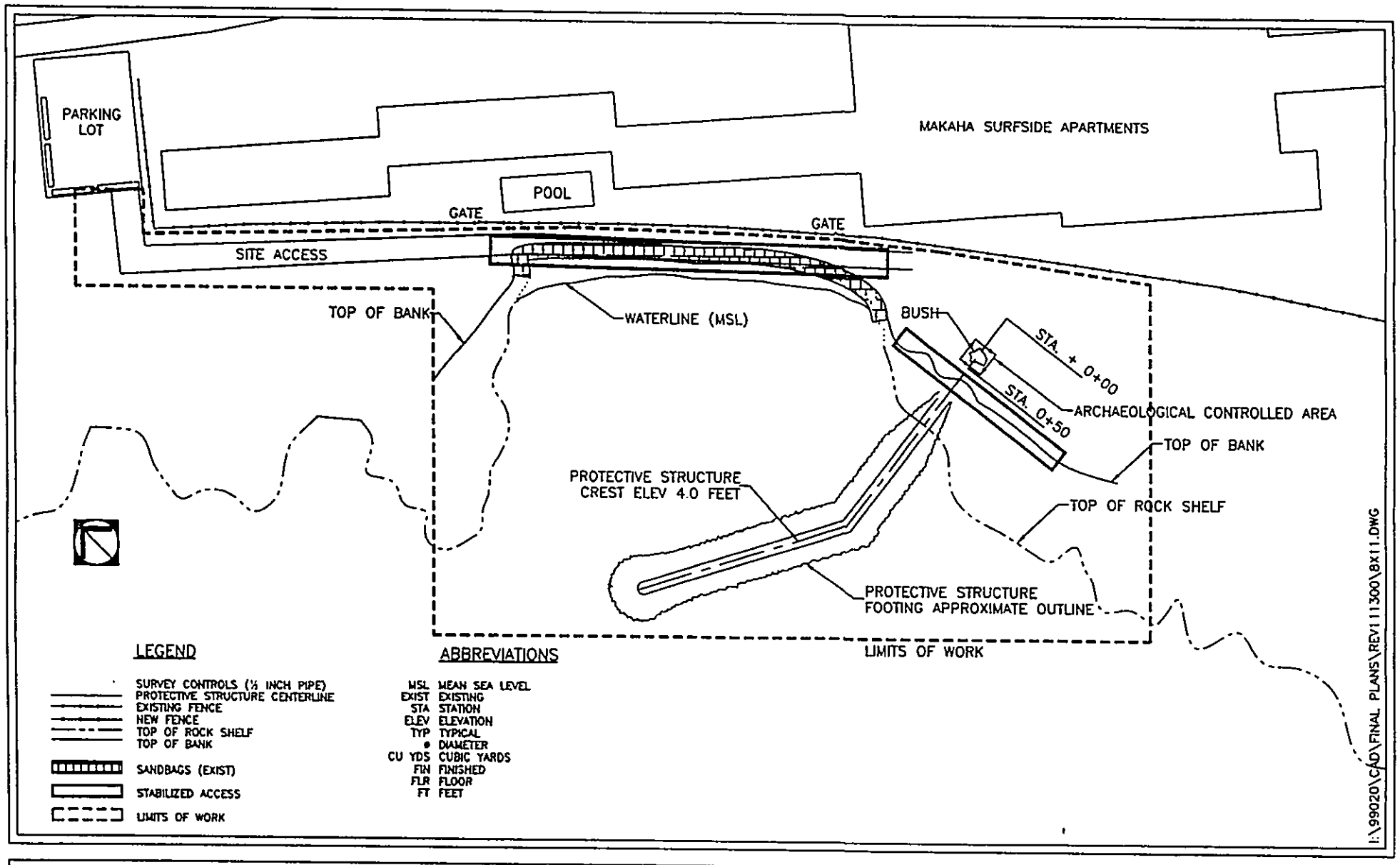

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FIGURE 2. SITE PLAN

SHORELINE PROTECTION AT MAUNALAHILAHI BEACH PARK

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Cultural Impacts

In order to assess impacts on cultural resources, information was obtained through community meetings and ethnographic interviews. We initially contacted key individuals and groups in the community who were known to be active in traditional cultural properties or other types of historic sites. These individuals and groups included: *Hui Malama I Na Kupuna `O Hawai`i Nei*, Mr. William Aila, Mr. Glenn Kila, and Mr. Clarence De Lude. The consensus of the conversations with these community members was that the most appropriate person to contact regarding these issues would be Mr. Lucio Badayos, who is one of the *kupuna*, or elders of this area.

A meeting with Mr. Badayos on site yielded some very important information. According to Badayos, his family owned a home in the project area along the southwestern shoreline of the park. Remnants of a retaining wall can be seen on site. Badayos also noted that his ancestors lived in the Lahilahi area and that the land where the park is located is sacred land and confirmed the existence of burials, noting that he performed a reburial at the site. He also noted that the area was and still is a good fishing area.

When asked his opinion of the project, Badayos noted that he thought the project would be a good idea because he believed that the breakwater would likely act like an artificial reef and would attract fish. He also noted that erosion control would minimize the probability of future shoreline burials being exposed.

Oceanit also attended community neighborhood board meetings on several occasions (August 31 and October 16, 2000 with the Parks Committee; and November 14, 2000 with the full board). While the neighborhood board park's subcommittee agreed to support the project, not enough votes were obtained in the full board meeting to support the subcommittee's recommendation. Some of the neighborhood board members stated that they needed more information before they could make a decision.

On December 13, 2000 the State of Hawaii Department of Land and Natural Resources held a public informational meeting in Waianae. While most community members supported the project, two individuals expressed concerns about the project including impacts on native hunting and gathering. One individual noted that the Draft Environmental Assessment (DEA) did not identify octopus and lobster populations in the vicinity of the project site. Oceanit noted that octopus and lobster populations were not observed during the marine biological field survey, but their presence in the general vicinity of the project site could be noted in the Final Environmental Assessment. Project related impacts to native hunting and gathering in the vicinity of the project site are not considered to be significant considering the small magnitude of this project. In fact, the addition of vertical relief and small crawl spaces from the breakwater is anticipated to increase biodiversity in the project area.

I hope that this letter provides you enough information to make an effect determination. If you have any questions or additional information, please feel free to call Mr. Ian Wasnich or me at 531-3017.

Thank you.

Sincerely,

David Takeyama, M.U.R.P.
Environmental Planner

cc: Lolly Silva, Corps of Engineers
Dean Uchida, Administrator, Land Division
Don Griffin, C&C of Honolulu, DDC

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

GILBERT COLOMA-AGARAN, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
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WATER RESOURCE MANAGEMENT

February 6, 2001

Mr. David Takeyama
Oceanit
1001 Bishop Street, Pacific Tower, Suite 2970
Honolulu, Hawaii 96813

LOG NO: 26936 ✓
DOC NO: 0102SC01

Dear Mr. Takeyama:

SUBJECT: National Historic Preservation Act, Section 106 Compliance – Shoreline Protection Project Proposed for Mauna Lahilahi Beach Park
Makaha, Wai`anae, O`ahu
TMK: 8-5-017: 005

Thank you for the opportunity to comment on revised plans made for the proposed shoreline protection project to be carried out at Mauna Lahilahi Beach Park. Our review is based on historic maps, aerial photographs, reports, and records maintained at the State Historic Preservation Division; in addition, Sara Collins of our office conducted a site inspection in September 2000 with your firm's representatives.

The revised plans call for the following actions:

(1) Access to the project site will occur from the northern end of the park and along the existing temporary sandbag revetment.
(2) Installation of acceptable erosion control measures will be required for all ground surface areas and embankments inland from the shoreline rock/coral shelf between Lahilahi Beach and Waianae High School. Erosion control measures shall be approved by the City and County of Honolulu Department of Design and Construction, in consultation with the State Historic Preservation Division, prior to implementation.

A knowledgeable informant, Mr. Lucio Badayos, has indicated the sensitive areas in and adjacent to the project area, and these locales will be protected from damage or access during construction. In addition, representatives of Koa Mana, Hui Malama I Na Kupuna `O Hawai`i Nei, and other groups were consulted. All referred your organization to Badayos as the most knowledgeable *kupuna* of the area.

It appears that consultation with Native Hawaiian groups and others in the community has been carried out satisfactorily, with important information received. We also agree with the implementation of acceptable erosion control measures, as described above. We would only recommend the additional measure of having a qualified archaeologist conduct on-site monitoring of the installation of protective fencing for sensitive areas, and any protective matting or other materials in the vicinity of archaeologically sensitive areas. An acceptable monitoring plan will need to be submitted for review and approval prior to beginning any construction work. An acceptable plan includes the following components:

> (1) The kinds of remains that are anticipated and where in the construction area the remains are likely to be found; (2) How the remains and deposits will be documented; (3) How the expected types of remains will be treated; (4) The archaeologist conducting the monitoring has the authority to halt construction in the immediate area of a find in order to carry out the plan; (5) A coordination meeting between the archaeologist and construction crew is scheduled, so that the construction team is aware of the plan; (6) What laboratory work will be done on remains that are collected; (7) A schedule for report preparation; and (8) Details concerning the archiving of any collections that are made.

Thus, if the proposed shoreline protection project is carried out as described, and with on-site archaeological monitoring in accordance with an approved place, then we believe that the proposed undertaking will have "no adverse effect" on significant historic sites.

Should you have any questions, please feel free to contact Sara Collins at 692-8026.

Aloha,

Gilbert Coloma-Agaran, Chairperson and
State Historic Preservation Officer

SC:jk

c: Mr. A. Van Horn Diamond, Chair, O`ahu Island Burial Council
Mr. Kala`au Wahilani, Burial Sites Program