Draft Environmental Assessment

Mauna Lahilahi Beach Park Shore Protection

Wai'anae, O'ahu, Hawai'i

Prepared for:

City & County of Honolulu

Dept. of Design and Construction
650 S King St.
Honolulu, HI 96813

Prepared by:

oceanit

828 Fort Street Mall
Suite 600
Honolulu, HI 96813

August 2010

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Contract F-73950

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Contact:
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I Introduction

1.1 General Information

This Draft Environmental Assessment (DEA) is prepared in accordance with Chapter 343 of the Hawai'i Revised Statues (HRS § 343) for a proposed inner breakwater at Mauna Lahilahi Beach Park in Wai`anae on the island of O`ahu, Hawai'i. An existing outer breakwater was constructed in June and July of 2003 (referred to as the "existing breakwater" herein) at Mauna Lahilahi Beach Park, and the proposed new breakwater would be built inside this existing structure. The environmental assessment for the outer breakwater, the *Final Environmental Assessment for Proposed Shore Protection at Mauna Lahilahi Beach Park* (Oceanit 2001), is incorporated herein by extensive reference for those data and analyses that remain unchanged. References from the 2001 EA are also made to illustrate the baseline for data and analyses that require significant updating.

Project Name:	**Mauna Lahilahi Beach Park Shore Protection**
Location:	Wai`anae, O`ahu, Hawai`i
Tax Map Key (TMK):	8-5-017:005 (and portions of parcels 4, 6, and 7)
Applicant:	Department of Design and Construction City and County of Honolulu 650 South King Street Honolulu, HI 96813
Consultant:	Oceanit Laboratories, Inc.
Landowner:	State of Hawai`i Department of Land and Natural Resources (submerged lands)
Land Area:	Approximately 8,000 square feet from the certified shoreline to the Mākaha Surfside property line
State Land Use District:	*Conservation* for submerged lands
Conservation Subzone:	*Limited*
County Development Plan:	*Park* along shoreline area. No designation for submerged lands.
City and County of Honolulu Zoning:	*Preservation General (P-2)* along shoreline. No designation for submerged lands.
Special Management Area:	This project's shoreline area is in the Special Management Area (SMA).

Permits/Approvals Requested:	• Department of the Army Section 10/404 permit • State of Hawai`i Department of Health, Section 401, Water Quality Certification • Department of Business, Economic Development and Tourism, Office of Planning, Coastal Zone Management (CZM) Federal Consistency • Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands, Conservation District Use Permit • DLNR State Historic Preservation Review
Approving Agency:	City and County of Honolulu, Department of Design and Construction
Anticipated Determination:	Finding of No Significant Impact (FONSI)

1.2 Location

The proposed construction site is in a small cove off Mauna Lahilahi Beach Park in Wai`anae, O`ahu, Hawai`i (Figure 1-1). The project site address is 85-101 C Farrington Highway, Wai`anae 96792. The TMK for the site is 8-5-017:005.

1.3 Land Ownership

Mauna Lahilahi Beach Park land at the project site is managed by the Department of Parks and Recreation of the City and County of Honolulu under Executive Order 3452.[1] The land use designations for the project area are shown in Figure 1-2. A small pocket beach located at the southeast end of the park and protected by the existing breakwater fronts the Mākaha Surfside Apartments (TMK: 8-5-017:008). The submerged lands where the breakwater will be installed are owned by the State Department of Land and Natural Resources.

[1] Executive Order 3452 may be found online at http://hawaii.gov/gov/news/executive-orders

Figure 1-1 Location Map

Figure 1-2 State Land Use Designation

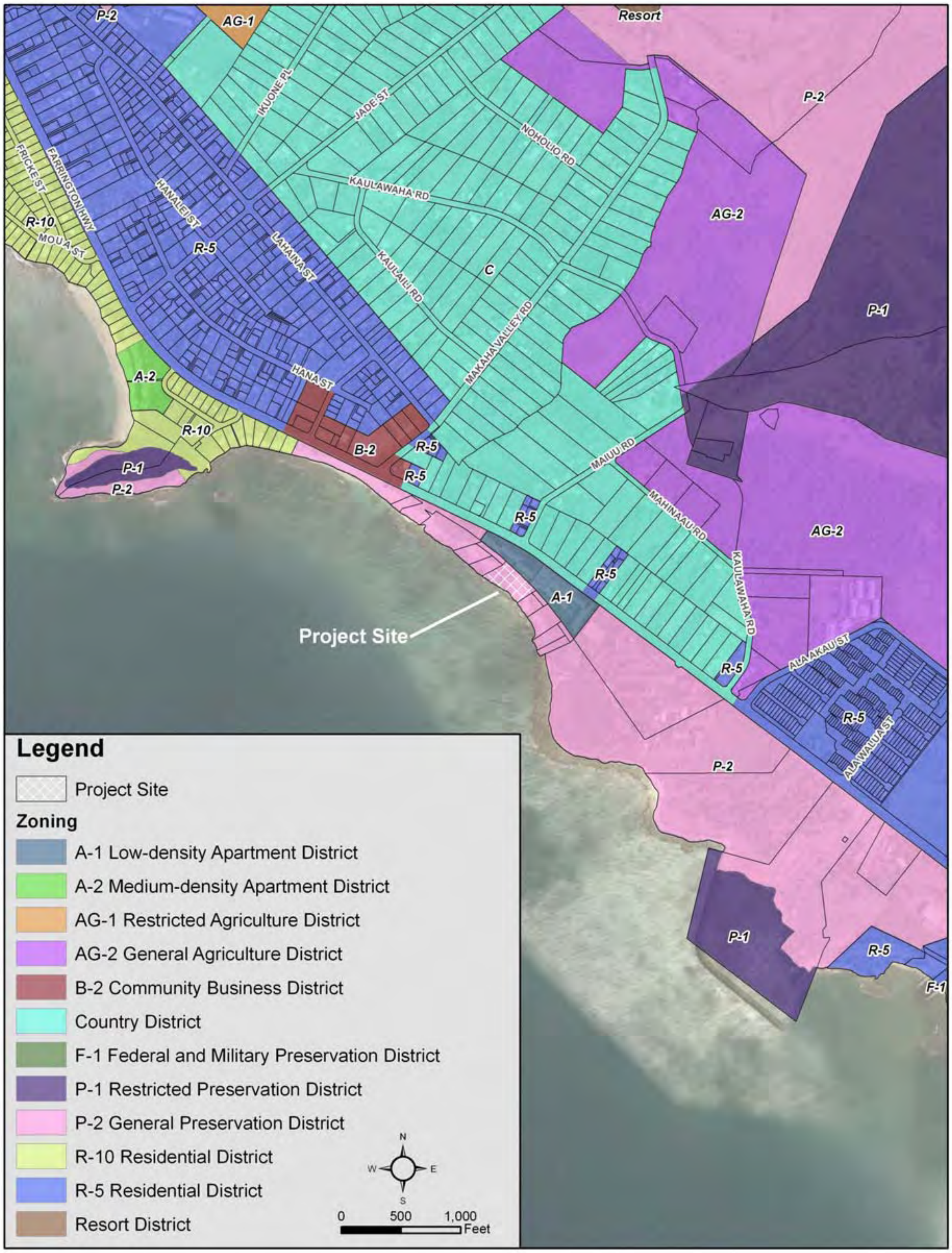

Figure 1-3 Zoning

1.4 Identification of Applicant

The City and County of Honolulu, Department of Design and Construction is the project applicant.

Contact: Mr. Clifford Lau, Chief
Facilities Division
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai`i 96813
Phone: (808) 768-8483

1.5 Identification of Environmental Consultant

The environmental consultant is Oceanit Laboratories, Inc.

Contact: Warren E. Bucher, Ph.D., P.E.
Senior Engineer, Project Manager
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, HI 96813
Phone: (808) 531-3017
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1.6 Identification of Approving Agency

The City and County of Honolulu Department of Design and Construction is the approving agency.

Contact: Mr. Clifford Lau, Chief
Facilities Division
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai`i 96813
Phone: (808) 768-8483

1.7 Compliance with Applicable Environmental Laws

This Environmental Assessment (EA) is prepared in accordance with the provisions of Chapter 343, Hawai`i Revised Statues (HRS §343). "Triggers" established in Section 343-5, HRS require preparation either an EA or an Environmental Impact Statement. The triggers for this EA are the following:

- use of state or county lands or funds;
- use of any land classified as Conservation District by state law (see Figure 1-3); and
- use of land within the Shoreline Setback Area

1.8 Identification of Agencies Consulted

Agencies and agency documents consulted in the preparation of this EA and the previous EA in 2001 are as follows:

<u>Federal</u>

Department of the Army, Corps of Engineers Pacific Ocean Division

<u>State Agencies</u>

Department of Land & Natural Resources

Office of Conservation and Coastal Lands

State Historic Preservation Office

Department of Health

Clean Water Branch

Department of Business, Economic Development, and Tourism

Coastal Zone Management Program

<u>City and County of Honolulu</u>

Department of Parks and Recreation

Department of Design and Construction

Department of Planning and Permitting

<u>Community Groups or Members:</u>

Mākaha Surfside Association of Apartment Owners (AOAO)

Wai`anae Coast Neighborhood Board No. 24

Mr. Alika Silva

2 Alternatives

2.1 Description of Alternatives

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

2.2 No Action Alternative

The eroded embankment is within 10 feet of the Mākaha Surfside property, and without protection the ongoing erosion and wave inundation at the north end of the property will continue. Without the existing sandbag revetment, erosion would reach into the Mākaha Surfside property as it has several times previously. The sandbag revetment requires periodic repairs and maintenance to provide continued protection. Further erosion could eliminate lateral access between the north end and south end of the beach park. Flooding of the backshore area would continue during periods of high surf.

2.3 Shoreline Revetment

There is a temporary sandbag revetment built along the shoreline to minimize erosion of the lateral access path and the Mākaha Surfside property. An alternative is to replace the sandbag revetment with a properly designed rock revetment. To be effective, a rock revetment would have to be moved seaward and built higher. Otherwise waves would overtop the revetment and run into the private property causing erosion and flooding. Another risk from this alternative is that a usable recreational beach would not stay on the seaward side of a revetment because of wave reflection and turbulence from incoming waves.

2.4 Enclose and Fill Cove

An alternative that would stop the erosion and protect the inland area is to build a rock structure across the mouth of the cove and fill the cove with rock or sand. This alternative is environmentally unacceptable because marine life including benthic flora and fauna live in the cove.

2.5 Inner Breakwater

The selected alternative is a second short breakwater that will run inside of and parallel to the existing breakwater. It is feasible to place the breakwater outside the existing breakwater, but this area contains much more marine life than the inside location. The new breakwater will partially intercept the waves that are entering the area on the north end of the cove. The new breakwater will be placed to allow free flow of water in and out of the protected area. Additional sand will be placed along the shoreline inside the new breakwater. Based on model studies, some of the sand will move to the north inside the new breakwater where waves previously prevented sand accumulation.

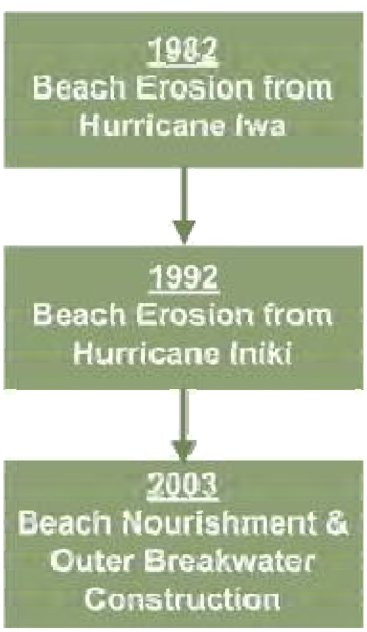
3 Project Description

3.1 Summary Description

The proposed project is to construct an inner breakwater to reduce wave energy and shoreline erosion of Mauna Lahilahi Beach Park fronting the Mākaha Surfside Apartments. The proposed breakwater will be shore-connected and constructed inside the existing breakwater that was evaluated in the *Final Environmental Assessment for Proposed Shore Protection at Mauna Lahilahi Beach Park* (Oceanit 2001).

3.2 History of Project Area

The project area is in a small cove or pocket beach fronting the Mākaha Surfside Apartments. Park area between the Surfside property line and the shoreline was placed under the control of the City and County of Honolulu Department of Parks and Recreation via State Executive Order 3452. Located on the leeward coast of O`ahu, Mauna Lahilahi Beach Park is subject to waves from Kona storms, southern swells, and North Pacific swells. The site is exposed to waves from the west-northwest (WNW) to the south-southeast (SSE). A large area of City and County park land and beach has been lost to shoreline erosion. Currently, the cove 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 outer breakwater constructed in 2003 shelters a sand-nourished pocket beach (Oceanit 2001). The shoreline on either side of the cove is a relatively level limestone bench raised several feet above sea level. The substrate at the sides and bottom of the cove is hard limestone covered with sand and rubble. Both flanking sides of the cove are steep rocky areas with little sand cover.



The cove at Mauna Lahilahi Beach was relatively stables until some time after 1949 when the beach toe began receding shoreward. The beach was still relatively wide in 1970 as shown in Figure 3-1, which provides a photo and topographic map of the beach area. However, the beach continued to erode in the 1970s. Hurricanes Iwa in 1982 and Iniki in 1992 caused nearly $2 million in damage to the Mākaha Surfside Apartments and eroded much of the shoreline fronting the property (Figures 3-2, 3-3, and 3-4). Overall, the shoreline within the pocket beach project area receded nearly 200 feet between 1949 and 1996 as can be seen in Figure 3-5. Aerial photos (Figures 3-6, 3-7, and 3-8) show progressive shoreline changes. An estimated 48,900 square feet of City & County park land presently valued at approximately $248,700 was lost to shoreline erosion between the early 1970s and 1996. The commercial value of the lost land is about $2 million. The top of the bank eroded through the fence into the Mākaha Surfside property before a sandbag revetment was constructed during the late 1990s. The existing breakwater was constructed and 10,000 cubic yards of beach sand were placed in 2003 (Figures 3-8, 3-9, and 3-10). The sandbag revetment was removed when the beach was nourished. Since 2003, the nourished sand has been pushed to the south between the breakwater and the shoreline embankment leaving the backshore at the cove's northeast corner exposed to further erosion by waves moving through the gap between the existing breakwater and rocky shoreline. An access road that formerly ran along the edge of the park property was entirely lost to erosion, and the sandbag revetment had to be rebuilt. From 2003 through 2008, high winter waves damaged the sandbag revetment requiring extensive repairs several times (see Figures 3-10i and 3-10j). Some of the sand at the south end migrated through the porous rock breakwater and moved offshore or onto the shoreline farther south.

From 2003 through 2008, the beach and breakwater were monitored and surveyed periodically to record transformation and condition. The final monitoring run was in October 2008. Surveyed transects through the beach and breakwater showing depth measurements are shown in Figure 3-11.

3.3 Purpose and Need for Proposed Project

The purpose for the proposed project is to minimize beach erosion and reduce property damage caused by waves that enter the cove at the south end of Mauna Lahilahi Beach Park. The City and County of Honolulu (CCH) proposes to construct a new short breakwater on the north side of the cove across the gap in the existing breakwater. The proposed breakwater is discussed in Section 3.4. Alternatives to this breakwater are given in Section 2. Since the existing breakwater is porous and wave action washes sand through the structure where it is lost to the beach, CCH is also proposing a method of sealing the breakwater to minimize sand loss.

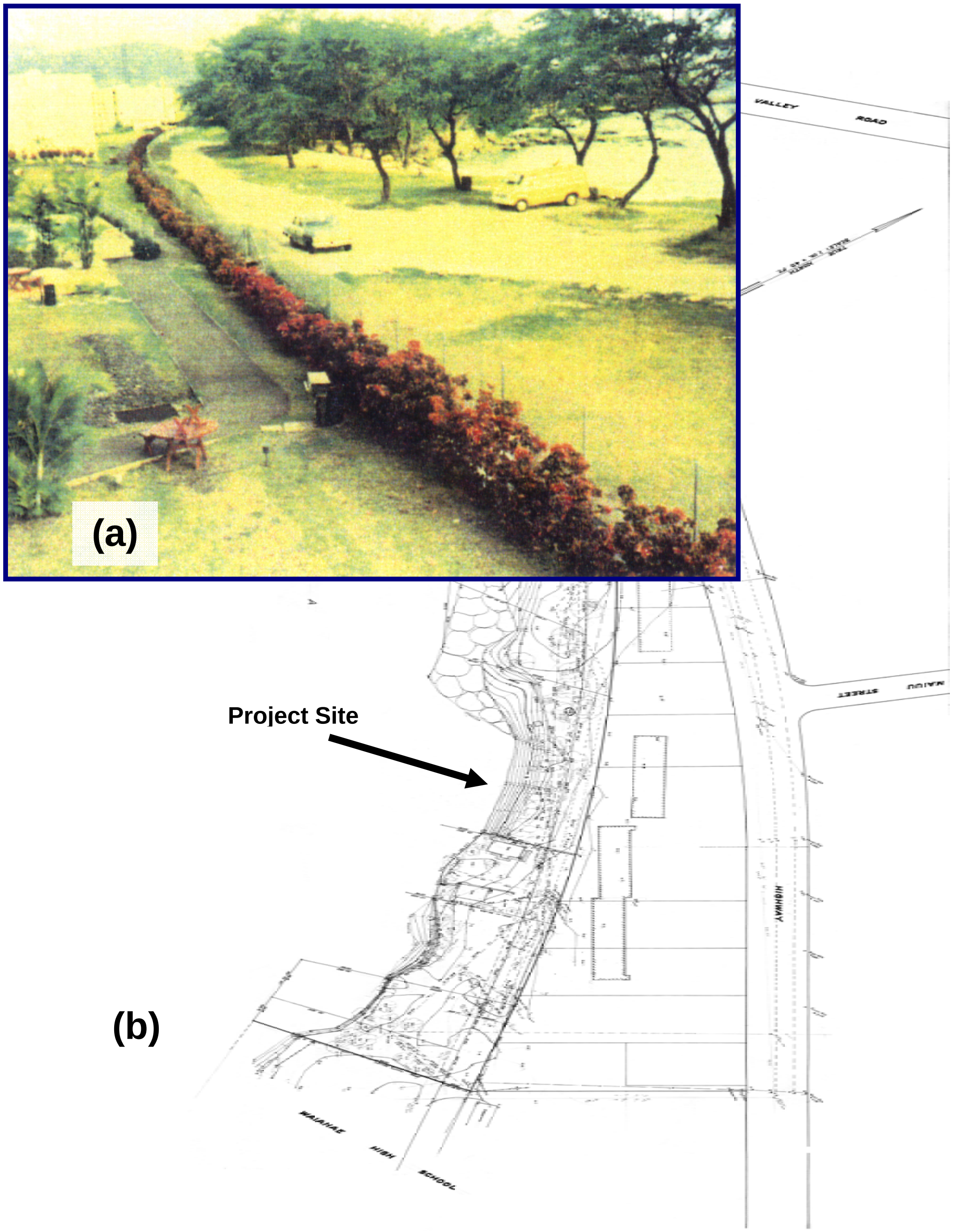


Figure 3-1 (a) Beach View of Mauna Lahilahi Cove in 1970. (b) Topographic Map of Mauna Lahilahi Cove, 1972 (Division of Land Survey & Acquisition); Oriented WNW Along Shoreline

Figure 3-2 Photo of Mauna Lahilahi Project Area in November 27, 1982 Following Hurricane Iwa; Oriented NW Along Shoreline.

Figure 3-3 Photo of Mauna Lahilahi Project Area in 1998; Oriented SE along Shoreline

Figure 3-4 Photo of Mauna Lahilahi Project Area with Sandbags in 2000

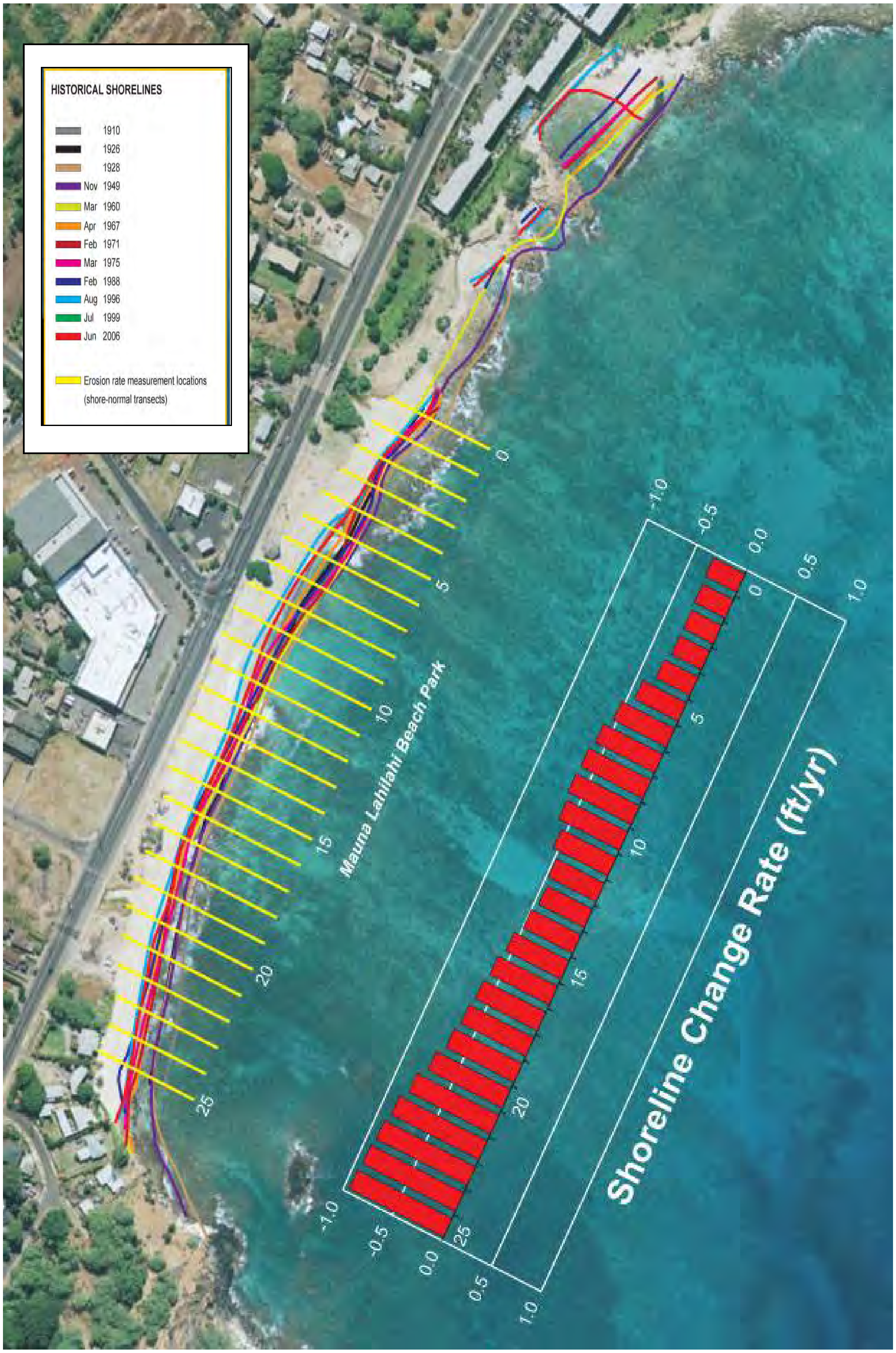


Figure 3-5 Shoreline Erosion Rates

Figure 3-6 Aerial Photo of Mauna Lahilahi Beach Area Following Hurricane Iniki in 1992

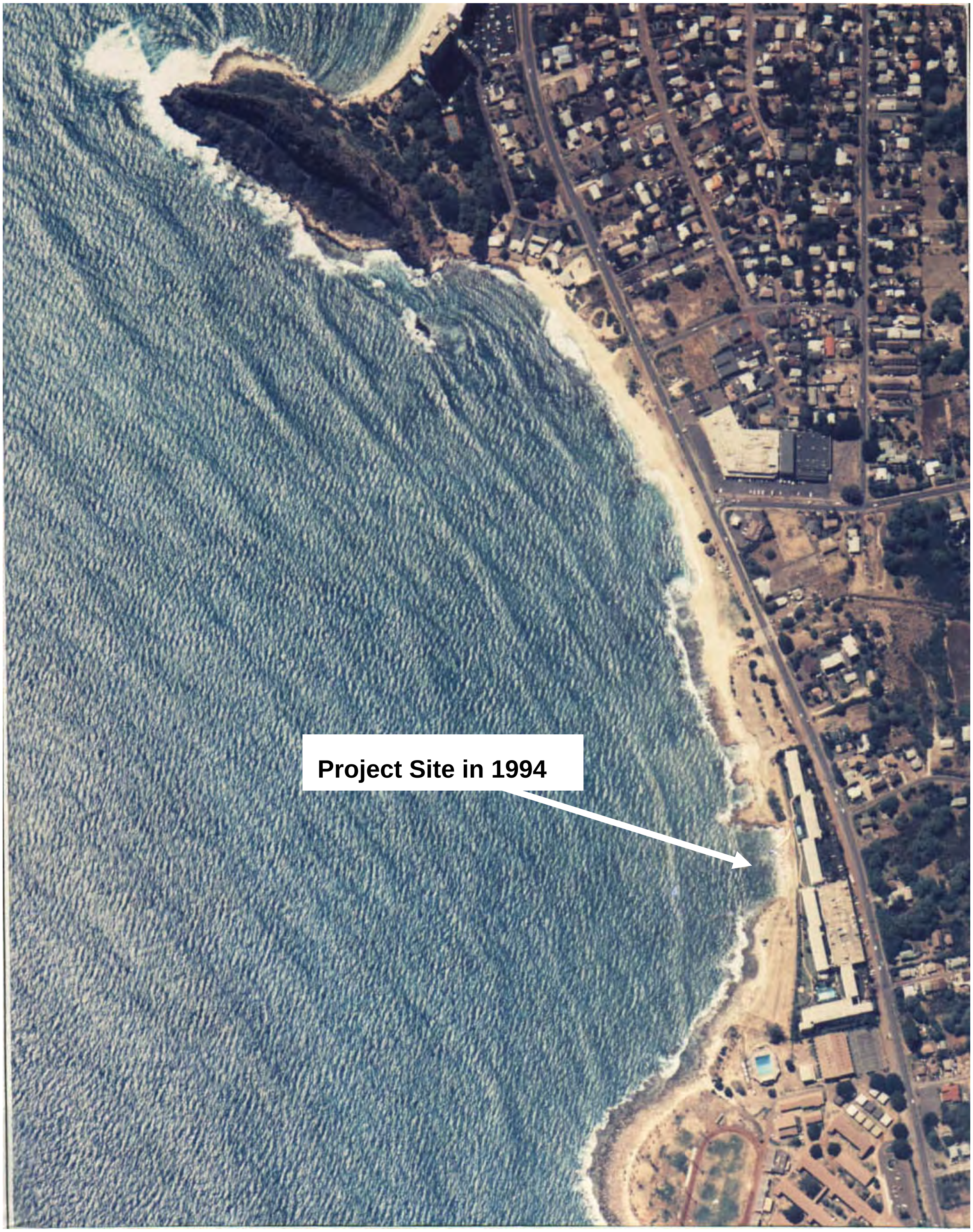


Figure 3-7 Aerial Photo of Mauna Lahilahi Beach Area from 1994

Figure 3-8 Aerial Photo of Mauna Lahilahi Beach Area in 2005 after Outer Breakwater Construction (University of Hawai`i, 2005); Oriented NNW, Along Shoreline

Figure 3-9 Aerial Photo from 2005 showing Beach Transformation in the Lee of the Breakwater

Figure 3-10a. View from North End in 2006; Sandbag Revetment

Figure 3-10b. View from North End in 2006; Sandbag Revetment

Figure 3-10c. View from North End in 2006; Migrated Beach Nourishment

Figure 3-10d. View from North End in 2006; Breakwater Connection

Figure 3-10e. View from North End in 2006; Existing Rock Breakwater

Figure 3-10f. View from North End in 2006; Breakwater Gap

Figure 3-10g. Placement of Beach Nourishment in 2003

Figure 3-10h. Beach Nourishment Shortly after Placement

 Figure 3-10i. Beach Erosion & Sandbag Revetment at North End in November 2005 (Courtesy of Jeanne Marx)	 Figure 3-10j. Beach Erosion & Sandbag Revetment at North End in January 2006

Figure 3-10 Various Views of Protected Shoreline

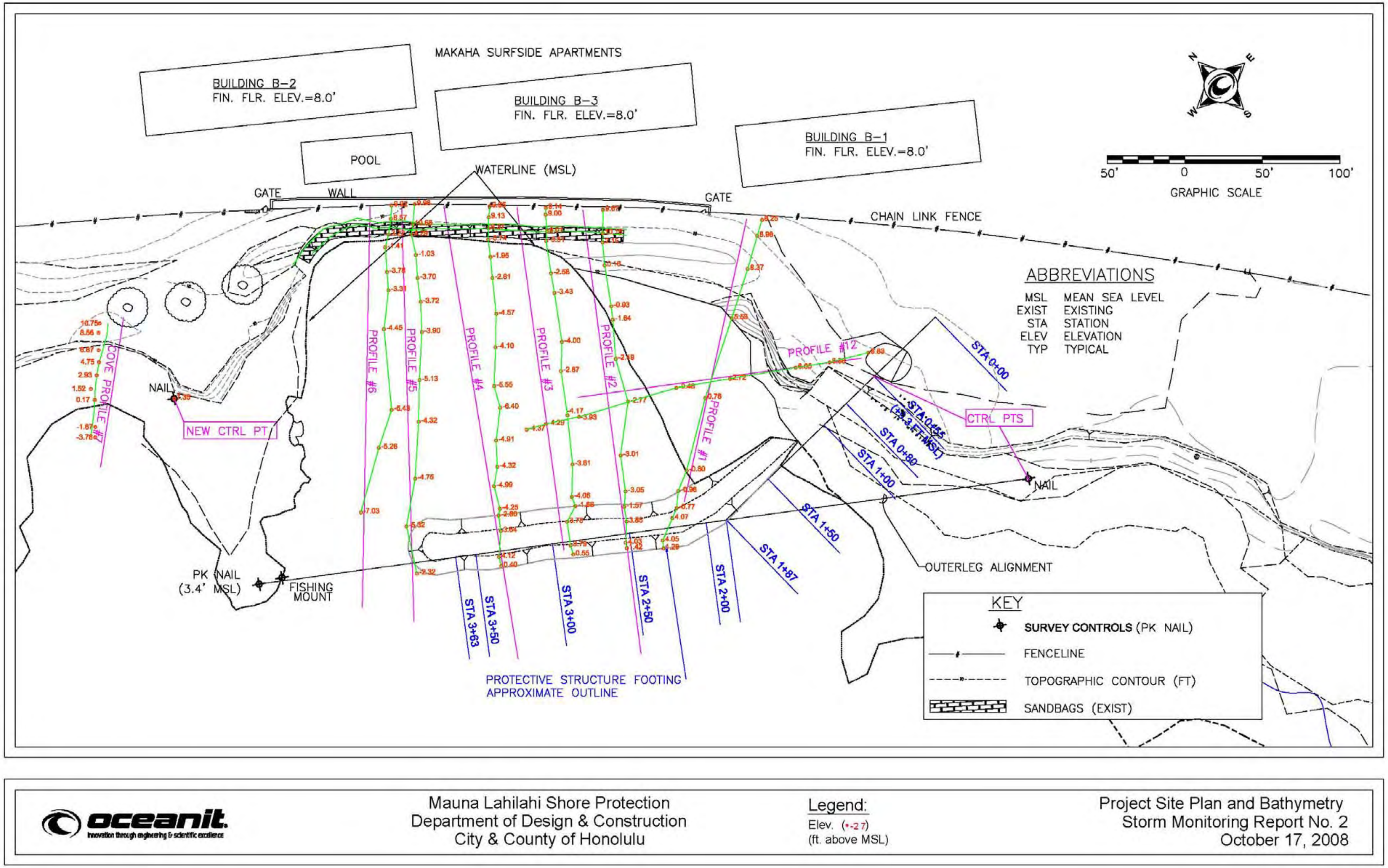


Figure 3-11 Project Site Plan and Bathymetry

3.4 Description of Proposed Project

3.4.1 New Breakwater

Several breakwater alternatives were evaluated with the coastal computer model, CEDAS. The selected alternative is a 90-foot rock breakwater that will run parallel to and inside the existing breakwater across the gap where waves currently enter the cove. The breakwater will be oriented perpendicular to the dominant nearshore wave direction. Figure 3-12 provides a graphic rendering of the proposed breakwater.

Figure 3-12 Rendering of New Breakwater

3.4.2 Reduce Sand Migration through Existing Breakwater

Wave action flushes sand through the voids in the rock structure and over the landward end of the existing breakwater. Some of this sand accumulates on the sea bottom and is washed up onto the beach to the south. Some is lost to the ocean. To reduce the sand migration through the existing breakwater, the sand pathways will be sealed with rock, gravel, and a geotextile filter.

3.5 Design of Proposed Project

3.5.1 New Breakwater Design

Design objectives for the proposed inner breakwater are to: 1) reduce wave energy within the cove, resulting beach erosion; 2) retain sand in a stable beach configuration; 3) maintain adequate water circulation; and 4) minimize impacts to the environment. Design parameters include wave height, period, and direction; currents and sediment transport; and structure size and location. The new structure is located inside (landward) of the existing breakwater to minimize any damage to the coral that grows seaward from the existing breakwater.

Mauna Lahilahi Beach Park is located on the leeward coast of O`ahu where the beach is subject to waves from Kona storms, hurricanes, southern swells, and North Pacific swells. The site is exposed to waves from the west-northwest to the south-southeast. Deep-water wave data within the exposure window were analyzed. 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 3 feet.

As waves approach the shore and enter shallow water, they will encounter bottom friction and refract (bend). Wave analysis indicates that waves from all directions within the site's exposure window align approximately with the shoreline (southwest) as they approach the project site. Wave refraction patterns can be seen in an aerial photograph (Figure 3-7).

Water depth at the opening of the cove is approximately 6 feet below mean sea level (MSL). Design water level for the structure was determined to be 2.9 feet MSL. This water level was calculated by adding the highest anticipated tide (1.9 feet MSL), potential wave setup (0.5 feet), and estimated sea level rise over the 50 year design life of the structure (0.5 feet). These conditions were used to calculate a design wave height of 7.0 feet, which is the maximum non-breaking wave that would reach the structure. This wave height was used to calculate breakwater rock size.

Breakwater length and orientation were determined by modeling wave transformation into the cove with the CEDAS coastal model. The model showed wave height and direction as waves move around the two breakwaters. The modeling objective was to find a configuration that minimizes wave height and consequently sand movement. Initially the CEDAS model was run with a unit wave height (1 foot wave), 7 second wave period, and the existing breakwater configuration. Results are shown in Figures 3-13 and 3-14. The wave height contours inside the breakwater vary from 0.5 feet to 0.1 feet. The wave direction vectors show that waves spread out around the shoreline and push sand to the south where it forms a beach. The waves also move directly into the north inner corner of the cove eroding the backshore.

The model was run again with an inside breakwater of various lengths to determine which configuration would reduce wave height the most and also change wave direction to spread sand more evenly along the shoreline. Results for the selected breakwater alternative are shown in Figures 3-15 and 3-16. In this case, wave heights inside both breakwaters vary from 0.3 to 0.1 feet near each structure. Much of the area inside has wave heights less than 10 percent of the offshore wave height. The wave direction vectors show that waves move around the new breakwater and into the sheltered area behind it. These results indicate that the double breakwater system will significantly attenuate outside waves and cause a more favorable beach shape behind the structures. With the existing breakwater, the north corner has suffered wave run-up, overtopping, and erosion damage; which the new breakwater should reduce.

The new structure is connected to the north shoreline and extends parallel to the existing breakwater as shown in Figure 3-17. Armor stone sizing was determined using methods in the Army Corps of Engineers Coastal Engineering Manual. The base of the breakwater will rest on a hard, consolidated bottom in approximately 4-6 feet of water. The breakwater core will be 100-pound stones about 1.0-1.5 feet in diameter. A geotextile filter layer will cover the core. The breakwater slopes will be constructed of armor stones, each about 2.5 tons (roughly 3.5 feet in diameter).

Plan view and a cross section of the proposed breakwater are shown in Figure 3-17. The breakwater crest is approximately 6 feet above MSL and has a width of approximately 16.5 feet. The face of the breakwater has a slope of 1:1.5. The maximum footprint of the structure is approximately 40 feet wide at a depth of 6 feet. The breakwater's seaward rock toe will extend 7 feet from the face and be 3.5 feet above the existing bottom. The total volume of rock fill for the breakwater is approximately 1,475 cubic yards.

About 2,000 cubic yards of beach sand will be placed along the shoreline inside the new breakwater as shown in Figure 3-17. The new beach will be monitored to observe the sand movement and beach shape.

3.6 Sand Filter for Existing Breakwater

Waves now wash sand through the existing breakwater to the outside bottom. Some of this sand is then carried up onto the rock shoreline to form a new beach to the south. Sand also passes around the landward end of the existing breakwater and moves south. To minimize sand loss, a rock and fabric filter system will be constructed along the inner face of the existing breakwater as shown in Figure 3-18. Approximately 81 cubic yards of graded rock will be placed for the sand filter.

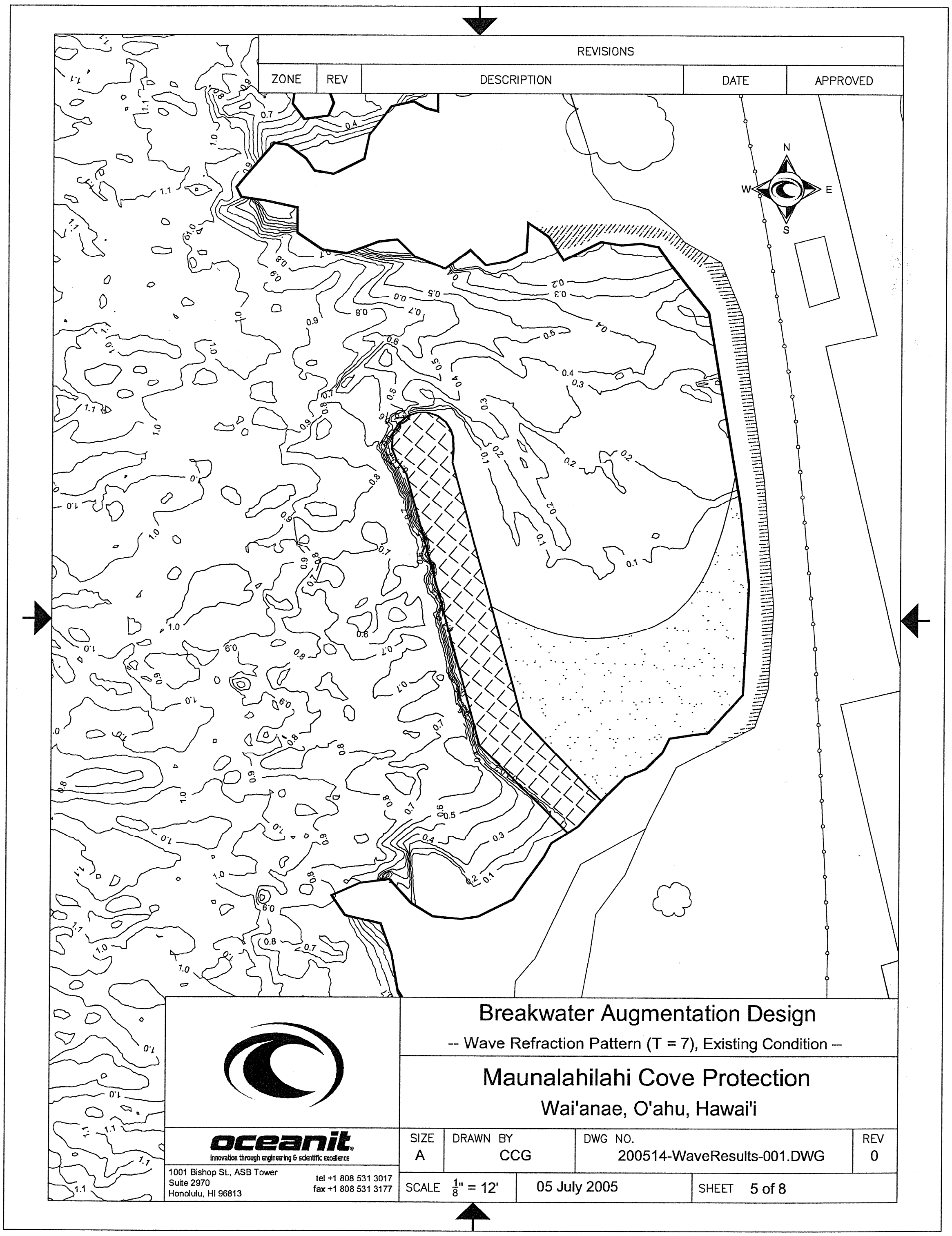


Figure 3-13 Unit Height Wave Transformation Contours around Existing Breakwater

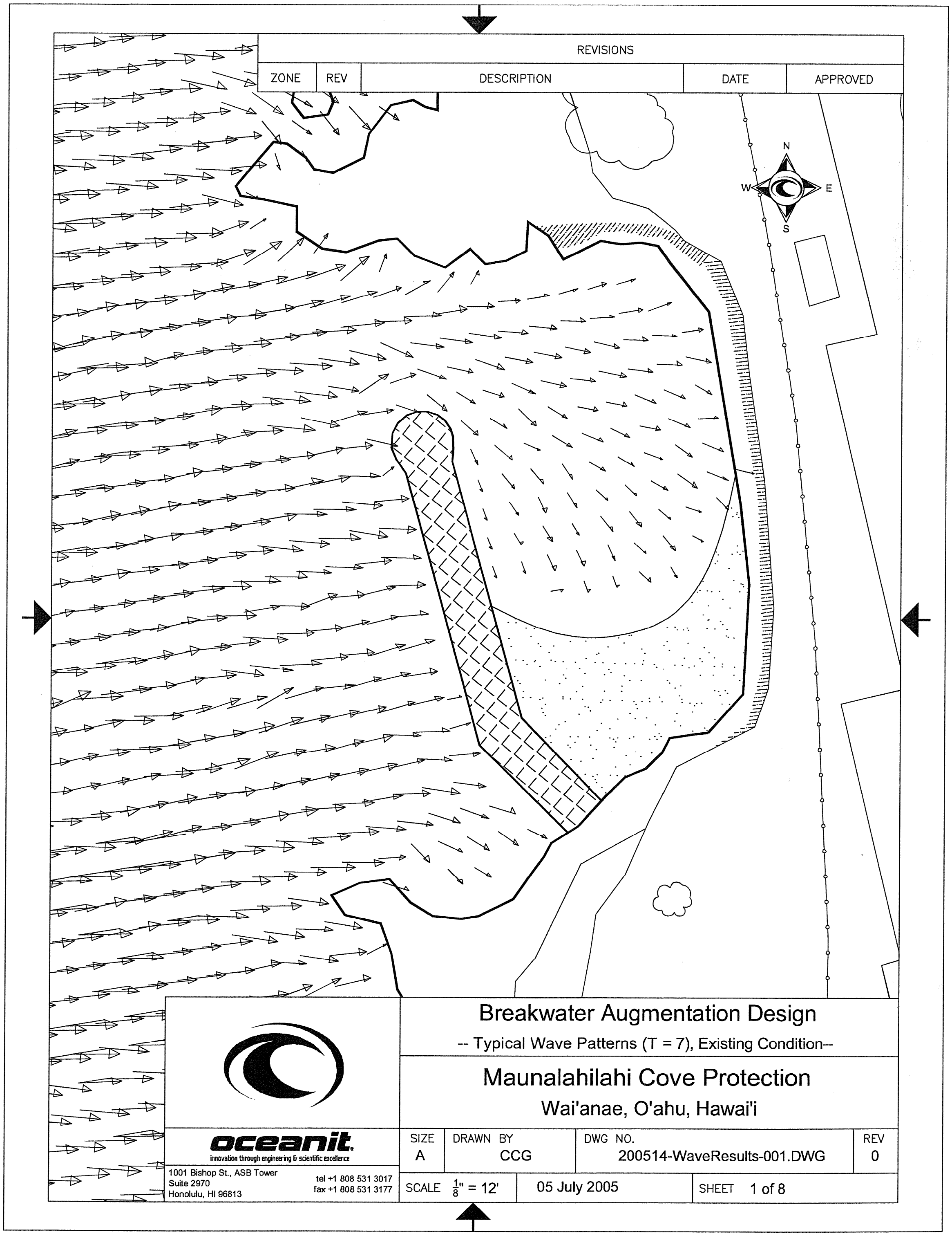


Figure 3-14 Unit Height Wave Transformation Direction Vectors for Existing Conditions

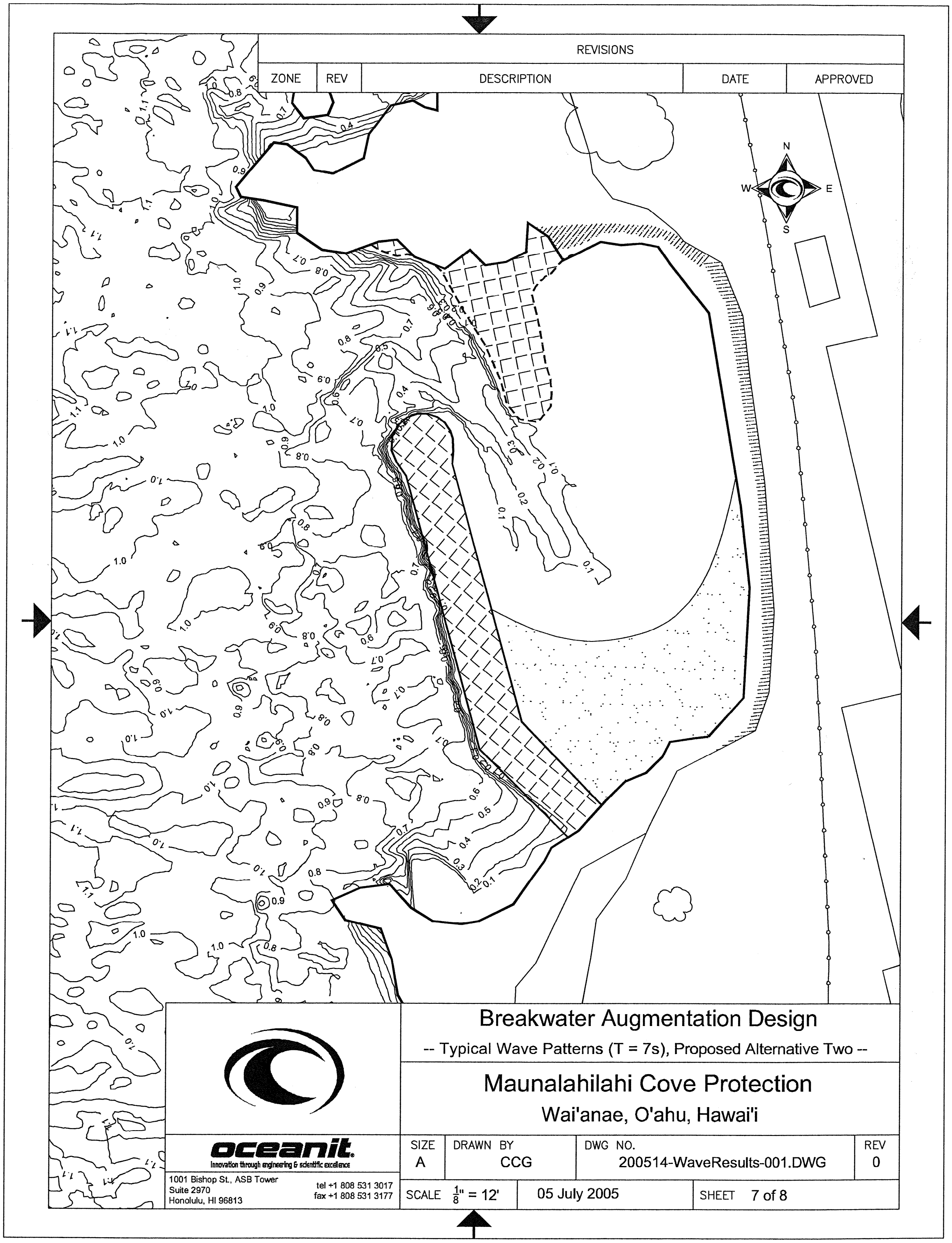


Figure 3-15 Unit Height Wave Transformation Contours with Proposed Inner Breakwater

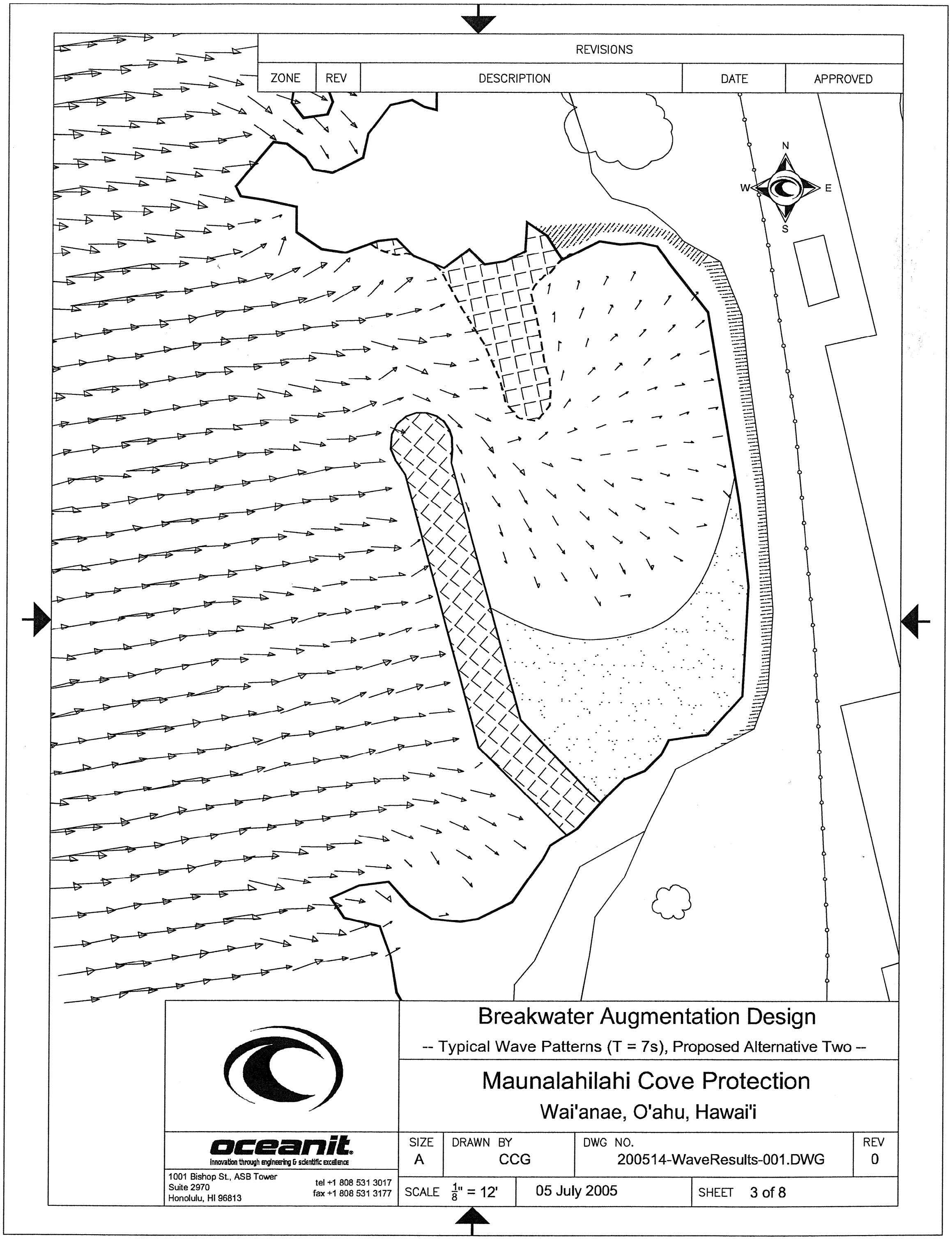


Figure 3-16 Unit Height Wave Transformation Direction Vectors for Selected Alternative

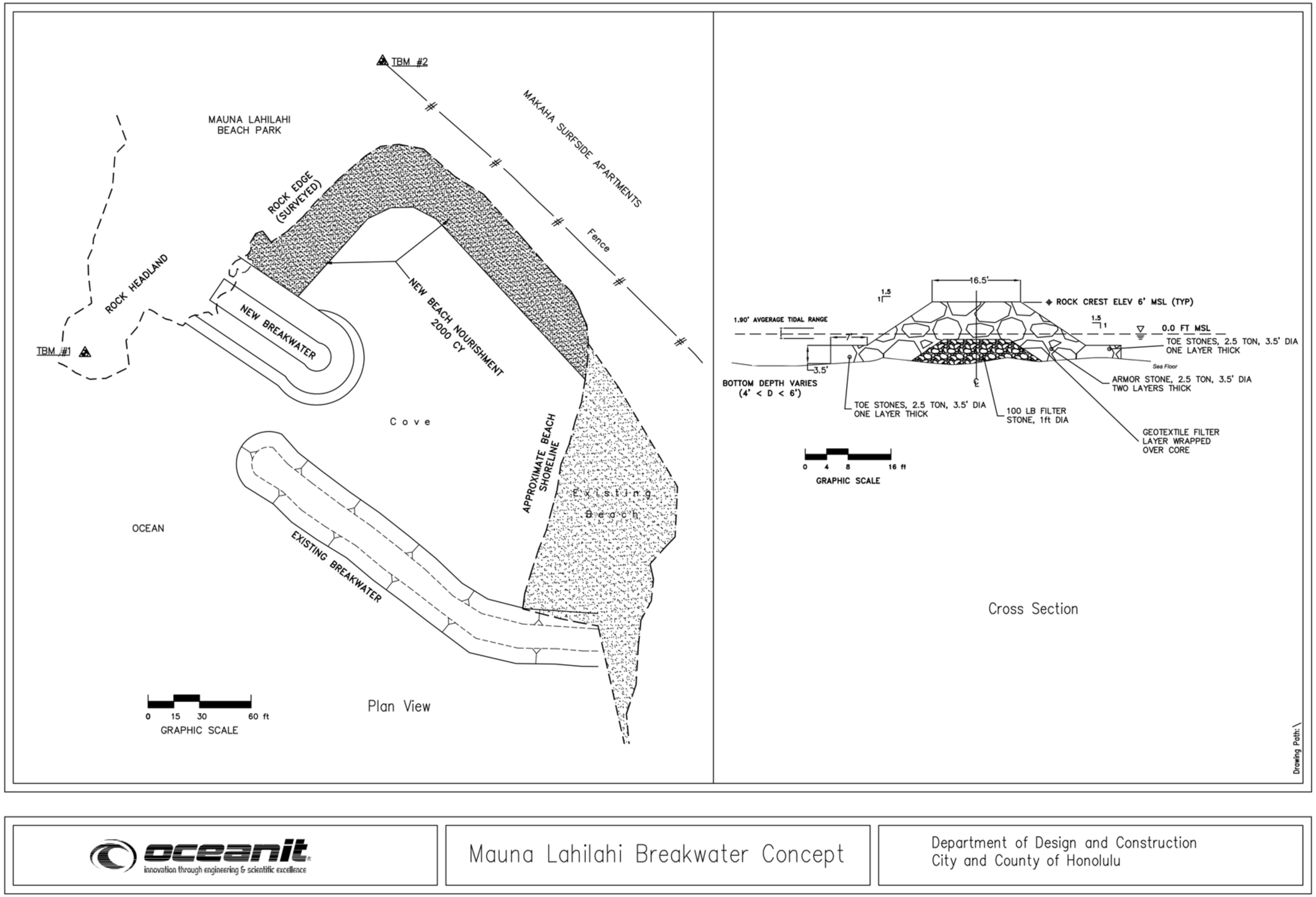


Figure 3-17 Proposed Inner Breakwater Plan, Cross Section, and Beach Nourishment

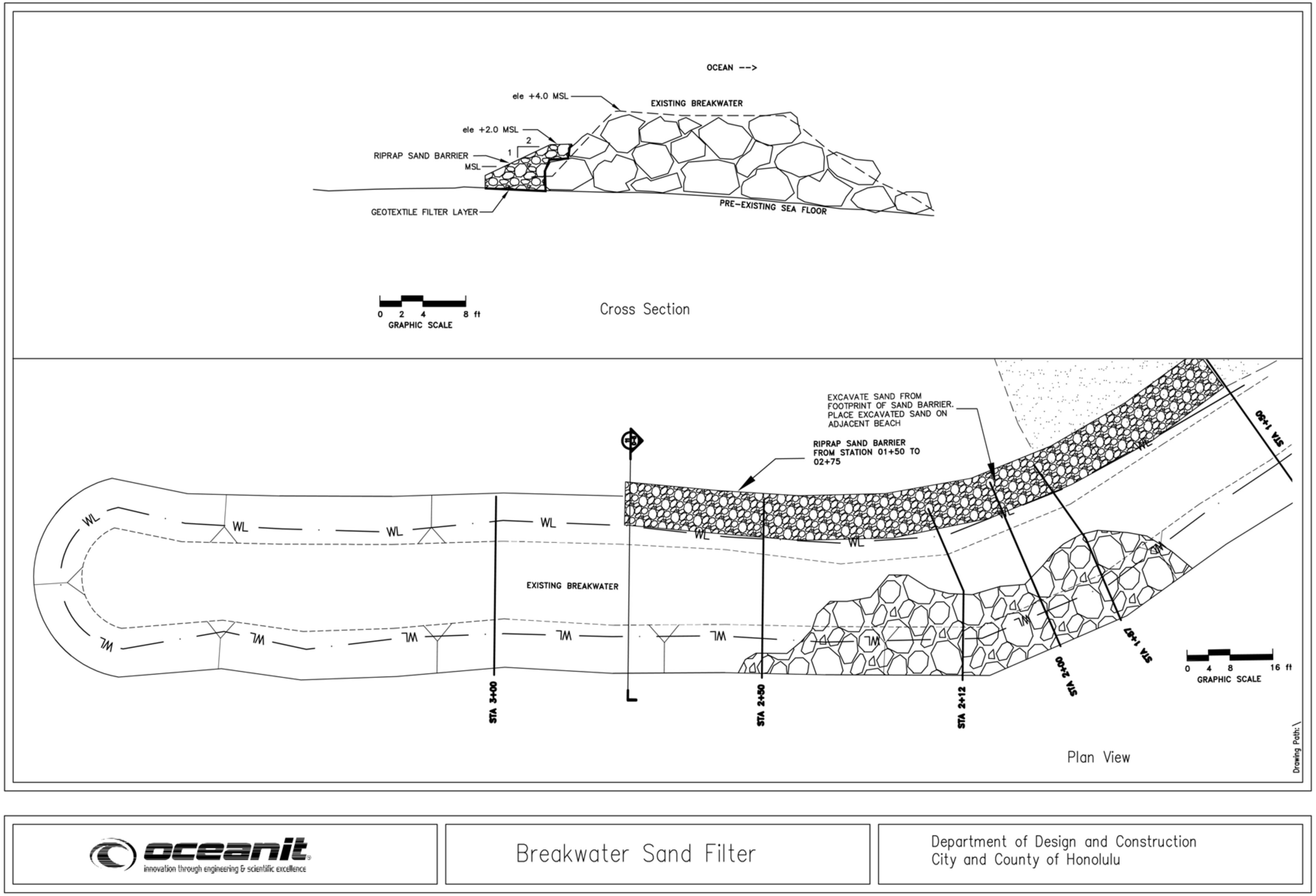


Figure 3-18 Proposed Sand Filter on Existing Breakwater

3.6.1 Construction

Construction is expected to take 2-3 months. The following is the proposed construction sequence: 1) construct new breakwater; 2) install sand filter on existing breakwater, and 3) place more nourishment sand on the beach. Site access will be both from Wai`anae High School and from the north of the Mākaha Surfside and will be shown on construction plans. Plans and specifications will indicate that no grading or grubbing is allowed and that all ground surfaces beneath stockpiles and operating equipment shall be protected. The contractor shall halt work in the vicinity of any burial or archaeological sites discovered during construction until cleared by the officer-in-charge or the State Historic Preservation Division.

The contactor will also be required to prepare and follow a Site Specific 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 Hawai`i Department of Health 401 Water Quality Certification.

4 Characteristics of Action

4.1 Socio-Economic Characteristics

The project affects primarily the value and use of the beach park and the property of the Mākaha Surfside Apartments. A portion of the beach park and a sand beach would not be usable without the existing breakwater and nourished sand beach. The Mākaha 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.

The threatened park area is about 1.5 acres with a value of approximately $450,000. The Mākaha Surfside land has an assessed value of over $10 million. The proposed new structure will better preserve the park area and better protect the Mākaha Surfside from erosion and wave damage.

The project is not expected to provide a large economic boost to the local community. Project construction may offer some economic benefits. Some construction materials may be purchased in the local area. A protected beach may be attractive to tourists or local families.

Oceanit attended community neighborhood board meetings on August 31, October 16, and November 14, 2000 prior to construction of the existing breakwater. While the neighborhood board park's subcommittee agreed to support the existing breakwater, not enough votes were obtained in the full board meeting to support the subcommittee's recommendation. The neighborhood board did not approve or disapprove the project.

At the 2000 neighborhood board meeting, members expressed concern that the existing breakwater might affect lobster and octopus fishing grounds. The location of the new planned breakwater and the area it will affect is not conducive to permanent habitation by octopus or lobster due to the turbulent nature of this shallow wave impacted zone. Lobster and octopus habitat exists beyond the existing and new breakwaters and will remain unaffected.

On December 13, 2000 the State of Hawai`i Department of Land and Natural Resources held a public informational meeting in Wai`anae for the construction of the original breakwater and beach nourishment. While most community members supported the project, certain individuals expressed concerns about the project including impacts on fishing and gathering. Construction of the new breakwater will probably not cause changes in the abundance of marine species at the site. The breakwater rocks will provide surfaces for settlement of benthic organisms; however, wave action will be continuous. Spaces between the armor stones will provide limited cover for some marine life. Even though the new breakwater will reduce wave energy into the cove, it is not likely that there will be a significant change in the size or amount of seaweed in the cove area.

4.2 Cultural and Archaeological Characteristics

The area of Mauna Lahilahi Beach Park near the project site contains human burials and locations where burials have been exposed by waves and removed. There is a cultural soil layer that can be seen where the coastal embankment is eroded.

Since the July 2001 environmental assessment, additional cultural/archaeological studies have been made near the erosion control site. Cultural Surveys Hawai'i Inc. has published seven reports on the culture and archaeology of area. These reports document artifacts and burials and review the history of the area. These are referenced in Section 11.

Information to assess cultural impacts was obtained through review of archaeological studies conducted in the area, community meetings, and ethnographic interviews. Planners initially contacted key individuals and groups in the community who were known to be knowledgeable about traditional cultural practices, properties or other types of historic sites.

Prior to the 2001 EA, Oceanit met with Mr. Lucio Badayos, a *kupuna* whose family formerly lived at the project site and who was recognized as the most appropriate person to contact regarding cultural issues. Oceanit also met with members of Mr. Badayos' family and representatives of the Burial Council. Mr. Badayos did not object to the plans for the existing breakwater.

The meeting with Mr. Badayos yielded some very important information. He 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.

Other Individuals and groups included: *Hui Malama I Na Kupuna `O Hawai`i Nei*, Mr. William Aila, Mr. Glenn Kila, Mr. Alika Silva, and Mr. Clarence De Lude.

During construction of the existing breakwater in June and July of 2003, a burial re-interment site that Mr. Badayos identified was fenced off to prevent construction equipment from damaging the site. A similar plan will be used for any additional sites near new construction areas. The nourished beach now protects the re-interment site.

An archeological study conducted by Cultural Surveys Hawai`i in 2003 documented the presence of burials in the vicinity of the project site. Earlier erosion associated with long periods of high surf has exposed remains. This project would reduce some of the shoreline erosion.

The State Historic Preservation Division has been consulted for guidance on minimal impact construction of the new breakwater. Oceanit is currently (2010) working with the City and County on a new project to design protection for cultural and archaeological sites found near the breakwater work site. This cultural protection project involves coordination and work with cultural experts and some of the same community members contacted earlier.

5 Description of Affected Environment

5.1 Ocean/Coastal Environment

5.1.1 General

The coastal shoreline of Wai`anae 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 intermittent due to low annual rainfall. The generally calm and clear adjacent coastal waters are excellent for fishing, diving, surfing, and other water sports.

Wai`anae'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. Offshore water depths are shallow. The 10-fathom (60-feet) contour is about 900 yards offshore from the project site.

5.1.2 Erosion

The beaches of the Wai`anae coast generally consist of light-colored coralline sand (Oceanic Institute, 1976). The subject property lost most of its beach since 1949 when the shoreline was approximately in the same location as the existing breakwater (see Figure 3-5). Prior to building the existing breakwater, waves entered along the southern shoreline of the cove and return currents exited out the center and north side of the cove. Outside the cove, currents move along the coast in both directions depending on the tide. This wave action and resulting currents likely caused the beach erosion. However, it is not known what caused the initial erosion after 1949. Hurricane Iwa in 1982 and Hurricane Iniki in 1992 both had a very obvious effect on the beach, and waves washed through the first floor of the Mākaha Surfside. During initial project inspections, no shoreline debris or trash was found at the site indicating that materials including sand are moved offshore or along shore. After the existing breakwater was constructed, waves moving through the breakwater regularly transport sand to the bottom outside the breakwater. Waves also push sand over the root of the breakwater and along the limestone bench to the south.

The construction of the additional breakwater will reduce wave activity directed at the affected shoreline, and also modify currents that move beach sand offshore, contributing to long-term beach stabilization.

5.1.3 Waves

A wave exposure window is shown in Figure 5-1. The most frequent wave directions are from the SSW (southern swell) and from the NW (north swell). The most frequent wave period is 12 to 14 seconds and the most frequent wave height is 3 feet. The design wave is discussed in Section 3.5.1.

5.1.4 Currents and Circulation

Currents on the Wai`anae coast are weak and dominated by the tides. Figure 5-2 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 caused by eddies that form down-current from Lahilahi point. Measured current speeds were typically near 0.25 knots (Wai`anae Boat Harbor Final EIS, 1976).

5.1.5 Tides

In Hawai`i, 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 1.9 feet above Mean Lower Low Water (MLLW). Mean High Water (MHW) is 1.44 feet above MLLW. The extreme low water is –1.41 foot below MLLW. Mean Sea Level (MSL) is 0.82 feet above MLLW (NOAA Tides and Currents web site).

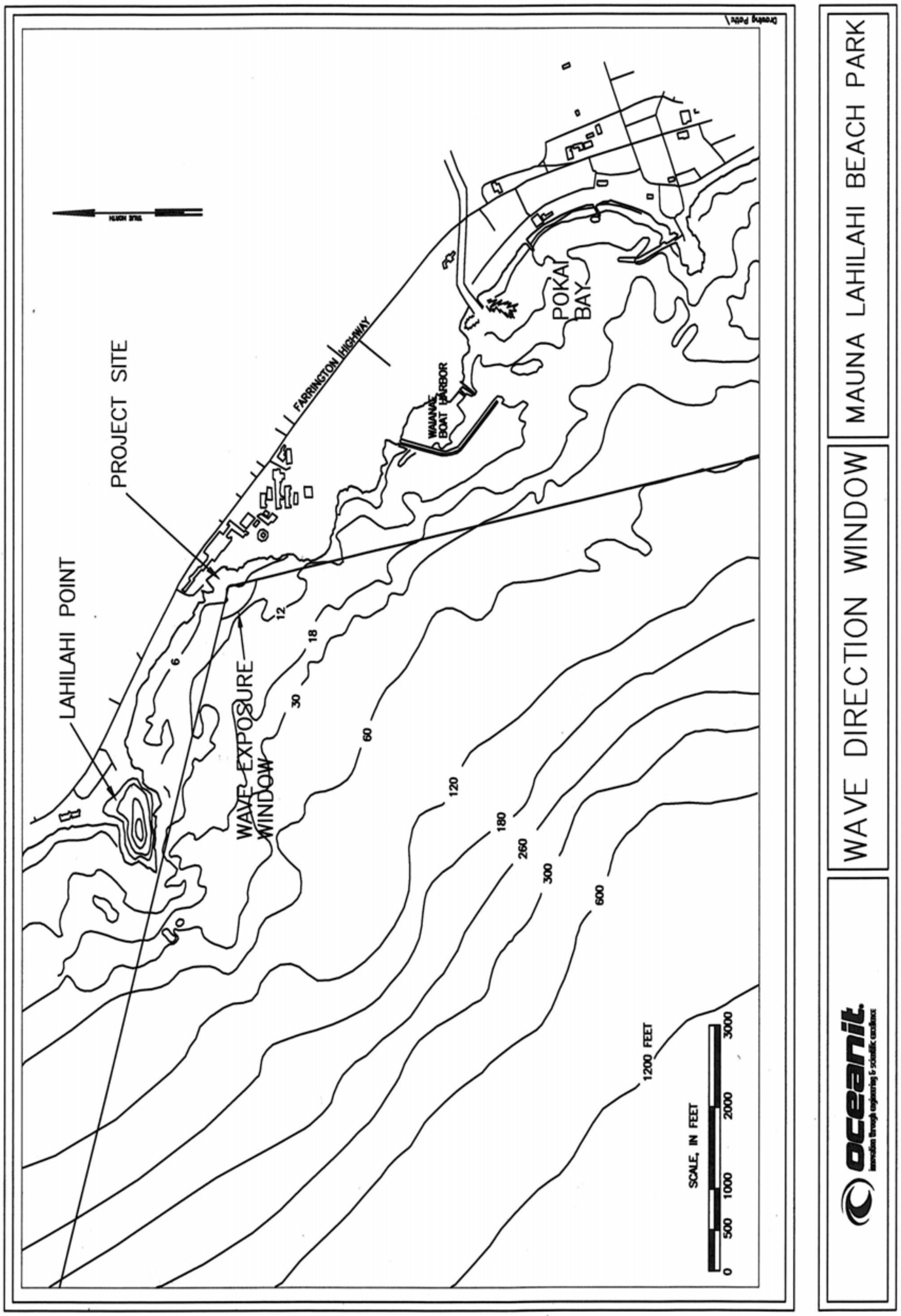
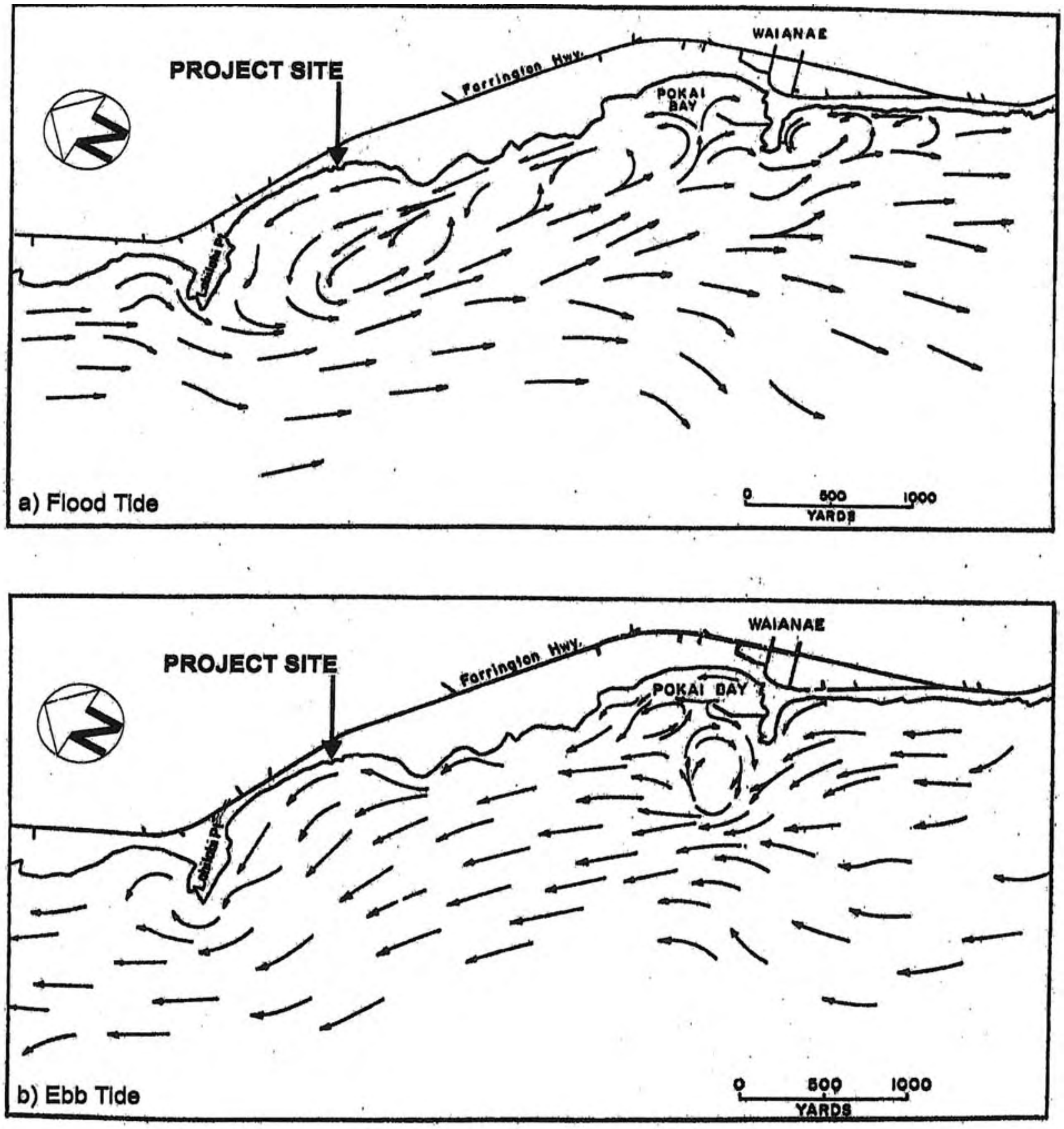


Figure 5-1 Wave Direction at Project Site



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

Figure 5-2 Current Patterns Mauna Lahilahi Beach Park

5.1.6 Water Quality

Wai`anae 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, including `Eku Stream to the north, and drainage ditches do discharge into coastal water; however, their influence on water quality is limited to periods of heavy rainfall. Water quality samples were taken at the locations shown in Figure 5-3. Results are summarized in Table 5-1. 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].

Table 5-1. Water Quality Results

		SAMPLE #			
Parameter	Units	1	2	3	4
PO4	(µg/l)	4.34	5.27	7.13	4.34
Nitrates + Nitrites	(µg/l)	1.96	4.06	6.30	6.30
NH4	(µg/l)	2.52	3.08	5.32	3.78
Tot. Phosphorus	(µg/l)	12.09	11.47	13.33	11.16
Tot. Nitrogen	(µg/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	(µg/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

Figure 5-3 Water Quality Sample Locations

5.1.7 Marine Biology

A marine biology investigation was made and a report was written and included in the environmental assessment for the existing breakwater (Oceanit Laboratories, Inc., 2001). Additional information on the marine environment can be found in the Final Environmental Impact Statement, Wai`anae Boat Harbor, Wai`anae, O`ahu, Hawai`i (1976).

The physical and biological environment was monitored for five years after the existing breakwater was constructed. Fourteen monitoring reports were provided to the Department of Design and Construction, The Army Corps of Engineers, Department of Health, and the Coastal Zone Management. Two of these reports were written after high wave events. Each report included surveyed bathymetric profiles from the inner shoreline to the new breakwater, analysis of sand sampled at some of the profiles, an assessment of breakwater and beach condition, a biological assessment of marine life on the breakwater, and analysis of algae samples for ciguatera.

The last progress report "Post Storm Monitoring #2" surveyed October 17, 2008, and submitted in December 2008 details the last post-construction observation of the existing breakwater. According to the report, as no significant changes in benthic conditions were observed, the benthic sand plume outside the breakwater extends 50-60 feet seaward and all fish observed were less than 6 inches in length. Extremely sparse coral establishment was noted on the breakwater boulders. Typical of a high wave energy environment, crustose coralline algae was found covering the rocks inside the breakwater nearest the beach, inside the breakwater 50 feet from the end, at the tip of the breakwater, outside the breakwater 50 feet from the tip, and at the outside breakwater 50 feet past the bend. Other algae observed include: turf algae on boulder faces inside the breakwater 50 feet from the end, and macro algae growth on boulders in the upper intertidal outside the breakwater, 50 feet from the tip.

Inside the breakwater 50 feet from the end, the coral heads facing away from the breakwater and on rocks above the sand level remain healthy. Off the breakwater tip, in the deeper waters of the breakwater channel, numerous coral colonies were observed, many of the smaller ones with bleaching at their leading edges. Outside the breakwater, 50 feet from the tip, a coral colony growing on one of the boulders, continues to expand laterally.

5.2 Land Environment

5.2.1 Climate

The climate at the project area and surrounding area is warm, sunny and dry, which is characteristic of the leeward shores of O`ahu. Average temperatures (Fahrenheit) in Wai`anae range from the high 60s to low 80s 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).

5.2.2 Existing Land Use

The project site is bounded on the southeast by Wai`anae High School and on the west by the Pacific Ocean. Abutting the project site to the northeast (*mauka*) are the Mākaha Surfside Apartments. Further northwest along the coast is Lahilahi Point with its adjacent beach park and urban/resort developments. Further southeast are the Wai`anae Boat Harbor and Pōka`i Bay. *Mauka* lands of the Wai`anae Valley are used for dairy, diversified agriculture and low-density residential areas with more densely populated neighborhoods closer to the coastline. Residential uses (single-family dwellings) predominate near the ocean around Wai`anae 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. 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 O`ahu.

5.2.3 Visual and Open Space

The project area as viewed from the Mākaha Surfside Apartments includes the Pacific Ocean to the south and west and Kamaile`unu Ridge of the Wai`anae 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 has a rocky shoreline with an escarpment and cannot be seen from Farrington Highway, the main coastal roadway.

5.2.4 Surface Hydrology and Drainage

Storm runoff from the upland areas during wet weather is directed to two drainage channels. One exits a few hundred feet north of the site under a highway bridge and the other exits south of the Wai`anae 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.

5.2.5 Flood Hazard/Tsunami/Hurricane

The Mākaha 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. Figure 5-4 is the Flood Insurance Rate Map for the project area.

Although hurricanes occur infrequently in Hawai`i, they occasionally hit the islands. Hurricane Iwa in 1982 and Hurricane Iniki in 1992 resulted in significant damage on Kaua`i. Both hurricanes also caused coastal flooding and damage on the leeward coast of O`ahu, including the Mākaha area. During Hurricane Iwa, wave run-up and inundation reached as far as 500 feet inland. Hurricane Iniki also resulted in extensive flooding as 15-foot waves inundated the shore and damaged seawalls and coastal structures (Sea Engineering, 1997).

5.2.6 Soils

According to a soil survey by the United States Soil Conservation Service (SCS, 1972), soils *mauka* of the shoreline at the Mākaha 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 Wai`anae High School, are listed as coral outcroppings (CR).

5.2.7 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 kōlea]), and shore crabs (*Graspus tenuicrustatuts*). The open shoreline area does not offer much 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.

5.2.8 Archaeology

There are a number of known burial sites in the park on either side of the project site. There is also a buried cultural layer that can be seen in the eroded embankment. The Cultural References Section of this Environmental Assessment lists reports and plans that have been written based on studies of the area. The City and County of Honolulu is determining if shore protection can be used to protect the cultural sites. Correspondence with the State Historic Preservation Office is included in Appendix A.

5.2.9 Noise

The major source of noise in the area is Farrington Highway, located approximately 300 feet *mauka* (inland) of the project site. The Mākaha 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 Mākaha area.

5.2.10 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.

5.2.11 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 O`ahu. Farrington Highway serves local traffic within the Wai`anae area and acts as a commuter highway for trips outside of Wai`anae. The highway can become congested during peak traffic hours. Peak traffic periods are between 5-7 a.m. for morning commuters to Honolulu.

5.2.12 Utilities

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

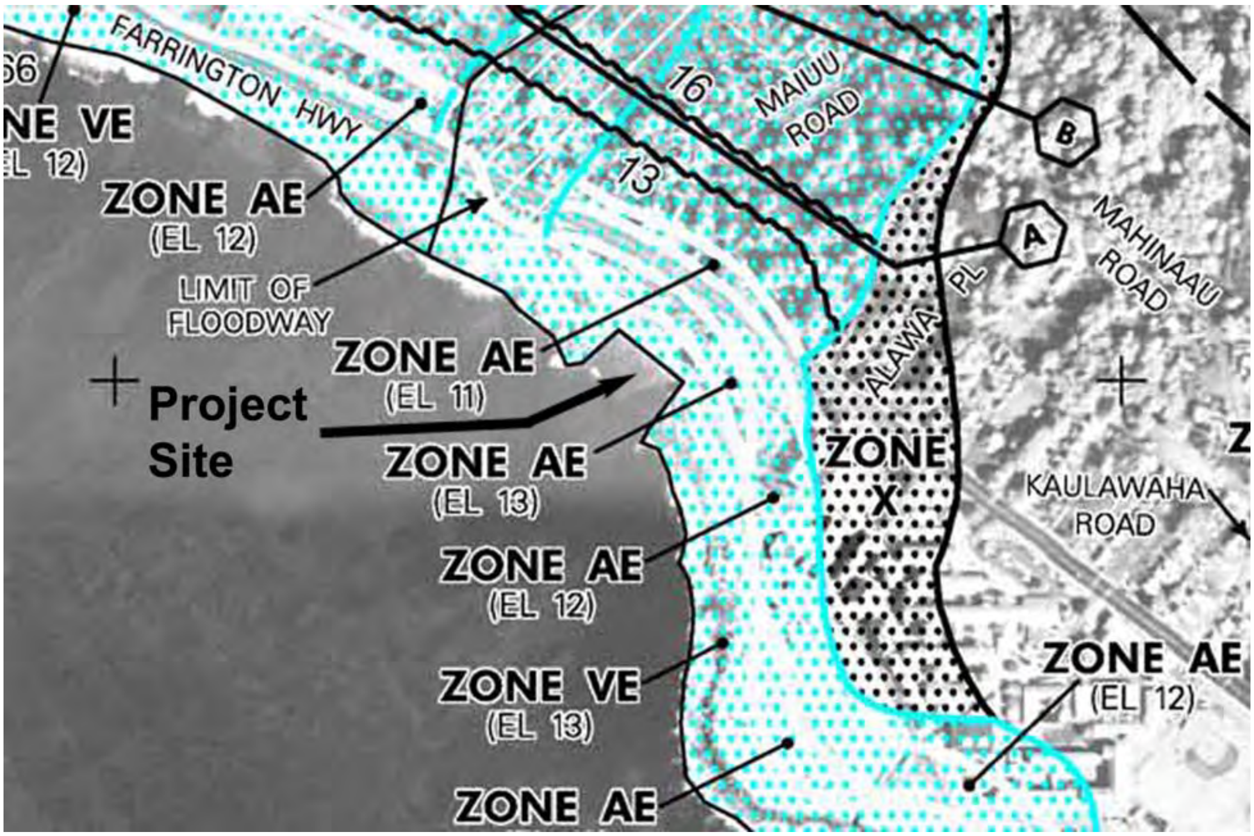


Figure 5-4 FEMA Flood Map

6 Conformance with Plans and Policies

6.1 Hawai`i State Plan and Functional Plans

6.1.1 Background

The Hawaiʻi State Plan was developed to serve as a guide for future development of the State of Hawaiʻi in areas of population growth, economic benefits, enhancement and preservation of the physical environment, facility systems maintenance and development, and socio-cultural advancement. The Plan identifies, in general, the goals, objectives, policies and priorities for the development and growth of the State. The Plan has not been revised since 1990-91.

Twelve Functional Plans were also developed to further define the goals and objectives of the Hawaiʻi State Plan. The twelve functional plans include: 1) Agriculture; 2) Conservation Lands; 3) Employment; 4) Energy; 5) Health; 6) Higher Education; 7) Historic Preservation; 8) Housing; 9) Recreation; 10) Tourism; 11) Transportation; and 12) Water Resources Development.

Functional plans that have a positive or adverse impact from the proposed breakwater and beach nourishment are Historic Preservation, Recreation, and Housing.

6.1.2 Historic Preservation

The Historic Preservation Functional Plan includes the following activities:

1. The preservation of historic properties;
2. The collection and preservation of historic records, artifacts and oral histories;
3. The provision of public information and education on the ethnic and cultural heritages and history of Hawai`i.

The area around the Mauna Lahilahi project contains burials and a sub-surface cultural layer. The area is well documented as listed in the Cultural References of Section 11. Most of the project is in the water and will not affect burials or the cultural layer. However, construction equipment will have to transit some of the potentially sensitive areas. Project plans include access maps for equipment. A cultural monitor will be employed during construction to advise the contractor and the County on any inadvertent finds.

6.1.3 Recreation

The objectives of the Recreation Functional Plan are to:

1. Assess present and potential supply of and demand for outdoor recreation resources,
2. Guide State and County agencies in acquiring or protecting land of recreational value,
3. Provide adequate recreation facilities and programs, and
4. Assure public access to recreation areas.

This is a City and County of Honolulu project. The purpose of the project is to preserve a recreational beach in Wai`anae's Mauna Lahilahi Beach Park by constructing a rock breakwater to minimize sand loss and to add sand to the eroded beach. By preserving the beach, lateral access along the shoreline will also be preserved. Without the existing and planned breakwaters and beach nourishment, there most likely would not be any lateral access today and probably no beach.

6.1.4 Housing

The Housing Functional Plan focuses on six areas. Two of these areas are affected by the project.

2. Expanding rental housing opportunities;
3. Expanding rental opportunities for the elderly and other special need groups.

The eroding beach is immediately in front of the Mākaha Surfside Apartments. Some of these apartments are for low income families. Also, historically these apartments have been less expensive than others in the area. On several occasions waves and erosion have extended from park land into the private property causing damage and flooding. The new breakwater will help reduce the risk of future damage.

6.2 General Plan of the City and County of Honolulu, 2006 Edition

6.2.1 Background

The General Plan of the City and County of Honolulu is a requirement of the City Charter. The General Plan is a guide for all levels of government, private enterprise, neighborhood and citizen groups, organizations, and individual citizens in eleven areas of concern:

1. Population;
2. Economic activity;
3. The natural environment;
4. Housing,
5. Transportation and utilities;
6. Energy;
7. Physical development and urban design;
8. Public safety;
9. Health and education;
10. Culture and recreation; and
11. Government operations and fiscal management.

Of these, two are most affected by the project: the natural environment, and culture and recreation.

6.2.2 The Natural Environment,

Objective A, Policy 2 is to: *Seek the restoration of environmentally damaged areas and natural resources.* The purpose of the project is to restore a lost beach and protect the beach and back shore area from erosion.

Objective B, Policy 1 is to: *Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.* The project will protect a section of the shoreline from wave erosion.

Objective B, Policy 4 is to P*rovide opportunities for recreational and educational use and physical contact with O`ahu's natural environment.* The project will provide a restored beach that is sheltered and is safe for swimming. Families already use the beach that was constructed in 2003. However, the existing beach could be larger with the proposed changes.

6.2.3 Culture and Recreation

Objective D, Policy 1: *Develop and maintain community-based parks to meet the needs of the different communities on O`ahu.* Mauna Lahilahi Beach Park is a major beach park in Wai`anae. The wave erosion at the project site has already caused major damage to the park. An improved beach will be used primarily by local residents.

Objective D, Policy 6: *Provide convenient access to all beaches and inland recreation areas.* If erosion of the beach park continues there will be no easy access to the south end of the park near Wai`anae High School. The Department of Parks and Recreation has planted numerous coconut trees in this area and there are also burial sites in the area.

Objective D, Policy 12: *Provide for safe and secure use of public parks, beaches, and recreation facilities.* When the shoreline was unprotected, it was 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 more sheltered, usable beach area in addition to providing the necessary protection against erosion. This will allow safer and more convenient access to the beach and public park land in this area.

7 Impacts and Mitigation

7.1 Direct Impacts

7.1.1 Marine Flora/Fauna

The proposed rock breakwater will cover an area approximately 90 feet long and 45-55 feet wide on the bottom. The bottom in this area is wave washed and scoured. It consists of hard substrate and rubble with little marine life. Some algae may be found, but there is little if any coral in the footprint of the proposed breakwater. Corals in this zone are likely subject to periodic destruction from large 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, which are located primarily seaward of the existing breakwater.

The loss of benthic habitat and associated organisms is partially mitigated by the new habitat represented by the structure itself. Coastal rubble structures provide substrata for new marine growth. 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 may permit colonization by coral species and provide increased habitat for crevice dwelling species such as crabs and habitat for algae. Since no sea turtles were sighted during monitoring (2003-2008), no negative impacts to sea turtle populations are expected.

Mitigation for the existing breakwater included a marine education program for students of Wai`anae High School. This program and donations of equipment and books were completed. No further mitigation is recommended.

7.1.2 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 equipment.

7.1.3 Water Quality

During construction of the breakwater and addition of beach sand, 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 including a water quality monitoring plan will also be submitted to the State of Hawai`i Department of Health (DOH) Clean Water Branch.

7.1.4 Currents and Circulation

Currents and overall circulation outside the cove are not expected to be affected since the proposed structure is located inside the existing breakwater. Current patterns are shown in Figure 5-2.

Currents and circulation between the proposed breakwater, the original breakwater, and shoreline will be reduced. The reduction of wave energy within the cove will modify the currents that presently contribute to offshore sand loss. The structure was designed to provide sufficient local circulation to maintain water quality within the lagoon. Water that may occasionally overtop the breakwater will flow back offshore through the gap between the two breakwaters.

7.1.5 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.

7.1.6 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 concentration is anticipated to be low. 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.

7.1.7 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 will be restricted to daytime hours.

7.1.8 Runoff

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

7.1.9 Archaeology

The southern part of the beach park contains a number of burial sites and an exposed cultural layer. These are shown in an archaeological monitoring plan prepared for construction of the existing breakwater (Hammatt, et al, March 2003). The State Historic Preservation Division provided recommendations (see Appendix A), and site visits and consultation with community members have been held. Burial sites have been identified and positions marked with GPS coordinates. Access routes and staging/stockpile locations are planned to avoid burial or other cultural sites during construction. Section 11 below is a list of related reports.

7.1.10 Surf

No surfing has been seen near the project during numerous visits. The nearest surfing site is at Mauna Lahilahi Point. Impacts to surfing are not expected.

7.1.11 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.

7.1.12 Hurricane/Storm Events

The proposed breakwater is not designed to prevent overtopping by waves from hurricanes, tsunami, or exceptionally large swells. A structure capable of such protection would be unreasonably large and expensive to construct and not guaranteed to hold up in a severe hurricane or tsunami event. Some degree of repair to the breakwater and beach may be required after severe storms such as Hurricanes Iwa or Iniki.

7.1.13 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 because the structure is oriented almost parallel to the shoreline and is located entirely within the existing lagoon, 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.

Post construction monitoring of the structure and surrounding beaches may be 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.

7.2 Indirect and Cumulative Impacts

7.2.1 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.

7.2.2 Water Quality

The breakwater and re-nourished sand beach will prevent erosion of backshore soil and clay, which over the long term should help reduce turbidity related to erosion.

7.2.3 Visual and Open Space

As noted in Section 5.2.3, the public beach area adjacent to Mauna Lahilahi Point contains significant stationary visual resources. The project will have very little visual impact on any view of Mauna Lahilahi.

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 Mākaha Surfside Apartment buildings block significant coastal roadway views of the ocean. The proposed breakwater is at or below the elevation of the surrounding coastal area and seaward of the buildings. It cannot be seen from the road and will not block views for apartment owners.

7.2.4 Beach Use and Water Safety

The breakwater and beach nourishment will improve the recreational use and safety of the beach and may increase beach park use. Both breakwaters can be used for fishing. During periods of high surf, waves could pose a danger to anyone standing on the breakwater.

7.2.5 Noise and Air Quality

Long-term noise and air quality will not be impacted by the proposed action. There will be equipment noise during construction. No air quality degradation was observed when the existing breakwater was constructed and no cumulative or indirect negative impacts are anticipated.

7.2.6 Traffic

The project will not impact traffic except temporarily during construction.

7.2.7 Archaeology

The breakwater and nourished sand beach will reduce erosion of backshore soil, which should protect burials and other archaeological sites in the vicinity of the project. Access for construction equipment will be controlled to avoid sensitive areas. The project is not expected to cause any cumulative impact on the cultural resources.

7.2.8 Beach Use

Beach use will be safer with the additional breakwater installed, so the cumulative impact will be positive.

7.2.9 Erosion

The cumulative impact on shoreline erosion will be positive. Erosion will be reduced.

8 Permits

8.1 Permits/Approvals Requested:

- Department of the Army Section 10/404 permit
- State of Hawai`i Department of Health, Section 401, Water Quality Certification
- Department of Business, Economic Development and Tourism, Office of Planning, Coastal Zone Management (CZM) Federal Consistency
- Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands, Conservation District Use Permit
- DLNR State Historic Preservation Review

A Certified Shoreline Survey could result in the project requiring a Special Management Area (SMA) permit or a Shoreline Setback Variance (SV) if breakwater construction is mauka of the shoreline.

The sand nourishment will take place in the water seaward of the existing sandbag wall and shoreline. Nourishment will require State and Federal permits but will not require an SMA Permit or an SV.

9 Significance and Determination

9.1 Significance

Based on the information contained in this document, the recommended 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 significance 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 the covered habitat will be lost or changed, 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. The breakwater may help preserve cultural sites from erosion.

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.

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 Hawai`i's State Environmental Policy which, as established in Chapter 344, Hawai`i Revised Statutes (HRS) is 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 waves and flooding.

5. *Substantially affects public health;*

As noted in Section 7 of this report, the project will have some short term 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 population or existing public facilities.

7. Involves a substantial degradation of environmental quality;

The proposed project is not expected to have any significant negative direct, indirect, or cumulative impact to environmental quality. Water quality should improve from reduced shoreline erosion. The anticipated environmental impacts of the proposed project are described in more detail in Section 7 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. The beach may have to be re-nourished periodically.

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*) may feed in the area. There are various types of sea weed growing on the rocks. If protected species enter the site, construction will be stopped until the animals voluntarily leave the area.

10. Detrimentally affects air or water quality or ambient noise levels;

As noted in Section 7, 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 breakwater is designed to protect a beach and inland buildings from erosion. However, it is not designed to prevent damage during a tsunami or hurricane. The breakwater itself could possibly sustain damage during an extreme event, but a larger rock structure is not recommended because of high cost, size, and esthetics.

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 Section 7 of this report.

13. Requires substantial energy consumption.

Construction of the proposed project will require only the energy necessary to run construction equipment. After construction, no energy will be needed.

9.2 Anticipated Determination

A Finding of No Significant Impact (FONSI) determination is anticipated for the project based on the information provided in this EA. The results of the environmental assessments conducted show that there will be no significant negative impact from constructing a new rock breakwater.

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APPENDIX A: Correspondence with State Historic Preservation Division

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MASUDA
DEPUTY DIRECTOR

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI HAWAI'I 96707

May 11, 2007

Mr. Warren Bucher, Ph.D., P.E.
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

LOG NO: 2007.1388
DOC NO: 0705amj06
Archaeology

Dear Mr. Bucher:

SUBJECT: Chapter 6E-8 Historic Preservation Review – Construction of Additional Shore Protection Breakwater at Mauna Lahilahi Beach Park
Wai'anae Ahupua'a, Wai'anae District, Island of O'ahu
TMK: (1) 8-4 and 8-5:various plats and parcels

Thank you for the opportunity to review the aforementioned document, which we received on April 27, 2007. According to your documents, which include a cover letter, aerial photograph, and project plans, the proposed project consists of constructing a second (inner) breakwater across from the one built in 2003. Our review of this project is based on files and records available at the State Historic Preservation Division. Although no site inspection was conducted, we are very familiar with the project area.

As stated in your cover letter, the new breakwater will be located in the ocean; thus, your main historic-preservation concern is access for construction equipment on the land. We recommend you consult with local community members in Wai'anae, and conduct a site visit of the project area with any concerned parties. In this way, we believe you can design a site access plan that will avoid and minimize potential adverse effects to historically- and culturally-significant resources that may be present.

We recommend consultation with the following individuals: (1) Mr. Alika Silva (Koa Mana), (2) Mr. William Ailā (Wai'anae Harbormaster), and (3) Ms. Alice Greenwood (O'ahu Island Burial Council), as well as the Wai'anae Neighborhood Board.

Please contact SHPD at (808) 692-8015 if you have any concerns regarding this letter.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

AMJ