DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 768-4567
Web site: www.honolulu.gov

KIRK CALDWELL
MAYOR

CHRIS T. TAKASHIGE, P.E., CCM
DIRECTOR

MARK YONAMINE, P.E.
DEPUTY DIRECTOR

558449

April 16, 2014

Ms. Jessica Wooley, Director Designate
Office of Environmental Quality Control
Department of Health
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

FILE COPY

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Dear Ms. Wooley:

Subject: Mauna Lahilahi Beach Park – Rock Revetment

With this letter, the Department of Design and Construction hereby transmits the final environmental assessment and finding of no significant impact (FEA-FONSI) for the Mauna Lahilahi Beach Park - Rock Revetment situated at TMK 8-5-017:005 in the Waianae District on the island of Oahu for publication in the next available edition of the Environmental Notice.

The Department of Design and Construction has included copies of comments and responses that it received during the 30-day public comment period on the draft environmental assessment and anticipated finding of no significant impact (DEA-AFONSI).

Enclosed is a completed OEQC Publication Form, two copies of the FEA-FONSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

Should there be any questions, please contact Clifford Lau, Chief of the Facilities Division, at 768-8478.

Very truly yours,

Chris T. Takashige, P.E., CCM
Director

CTT:li

Enclosures

AGENCY ACTIONS
SECTION 343-5(B), HRS
PUBLICATION FORM (FEBRUARY 2013 REVISION)

Project Name: Mauna Lahilahi Beach Park Rock Revetment
Island: O`ahu
District: Wai`anae
TMK: 8-5-0017:005
Permits: Department of the Army, Department of Health 401 WQC, Conservation District Use Permit, CZM Federal Consistency, SHPD Ch 6E-8 Historic Preservation Review
Proposing/Determination Agency: Department of Design and Construction, City and County of Honolulu, 650 South King St. Honolulu, HI 96813, Clifford Lau, P.E. 768-8483
Accepting Authority:
(for EIS submittals only)
Consultant: Oceanit, 828 Fort Street Mall, Suite 600, Honolulu, HI 96813, Dayananda Vithanage, P.E., Ph.D., 531-3017
Status (check one only):

__DEA-AFNSI	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.
_X_FEA-FONSI	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
__FEA-EISPN	Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.
__Act 172-12 EISPN	Submit the proposing agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
__DEIS	The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
__FEIS	The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
__Section 11-200-23 Determination	The accepting authority simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the proposing agency. No comment period ensues upon publication in the periodic bulletin.
__Section 11-200-27 Determination	The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.
__Withdrawal (explain)	

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

The beach and shoreline at Mauna Lahilahi Beach Park in Wai`anae on the island of O`ahu have been eroding for more than 50 years. All of the beach sand and some of the backshore substrate were lost along a 350-foot shoreline cove. A temporary sandbag revetment was constructed at the cove in 1999. A rock breakwater and nourished beach were constructed in June and July of 2003. But neither the sandbag revetment nor the breakwater stopped all of the continuing shoreline damage. The proposed action is to construct a shore protection rock revetment along the threatened shoreline. The proposed rock revetment would be built to replace the sandbag revetment to minimize erosion of a lateral access path and beach park property. In addition the revetment will reduce wave overtopping and runup across park property into the adjoining Makaha Surfside Apartments and partially protect Hawai`ian cultural sites and burials in the park.

Final Environmental Assessment
Mauna Lahilahi Beach Park Rock Revetment

Waiʻanae, Oahu, Hawaii

Prepared for:
City and County of Honolulu
Department of Design and Construction

Prepared by:
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

March 2014

oceanit
innovation through engineering & scientific excellence

Mauna Lahilahi Beach Park Rock Revetment

Final Environmental Assessment

Contract F-73950

March 2014

Prepared For:

Department of Design and Construction

650 South King Street

Honolulu, HI 96813

Prepared By:

Oceanit

828 Fort Street Mall, Ste. 600

Honolulu, HI 96813

Contact:

Mr. Clifford Lau, Chief

Facilities Division

Department of Design and Construction
(808) 768-8483

Contact:

Dayananda Vithanage, P.E., Ph.D.

Director of Engineering

Oceanit
(808) 531-3017

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1. 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 rock revetment at Mauna Lahilahi Beach Park in Wai‘anae on the island of O‘ahu, Hawai‘i. The proposed rock revetment would be built to replace the temporary sandbag revetment along the shoreline to minimize erosion of the lateral access path and the Makaha Surfside property. An existing breakwater was constructed in June and July of 2003 (referred to as the "existing breakwater" herein) at Mauna Lahilahi Beach Park. The environmental assessment for the 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 Rock Revetment**
Location:	Wai‘anae, O‘ahu, Hawai‘i
Tax Map Key (TMK):	8-5-017:005 (and portions of parcels 4, 6, and 7)
Proposing Agency:	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) and City and County of Honolulu
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:	*Protected*
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:	The project is seaward of the Certified Shoreline and is not within the Special Management Area.

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
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, Hawai'i 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] A small pocket beach located at the southeast end of the park and protected by the existing breakwater fronts the Makaha Surfside Apartments (TMK: 8-5-017:008). The project area is within the Urban State Land Use District, as shown in Figure 1-2. However, the beach park and the Makaha Surfside Apartments are located in two different zones. As shown in Figure 1-3, the beach park is located within the General Preservation (P-2) zone. The formerly dry land area is mostly in the water. Makaha Surfside Apartments, adjacent to the beach park, is zoned as Low-density Apartment (A-1). The submerged lands where the toe of the rock revetment will be constructed are under the jurisdiction of 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

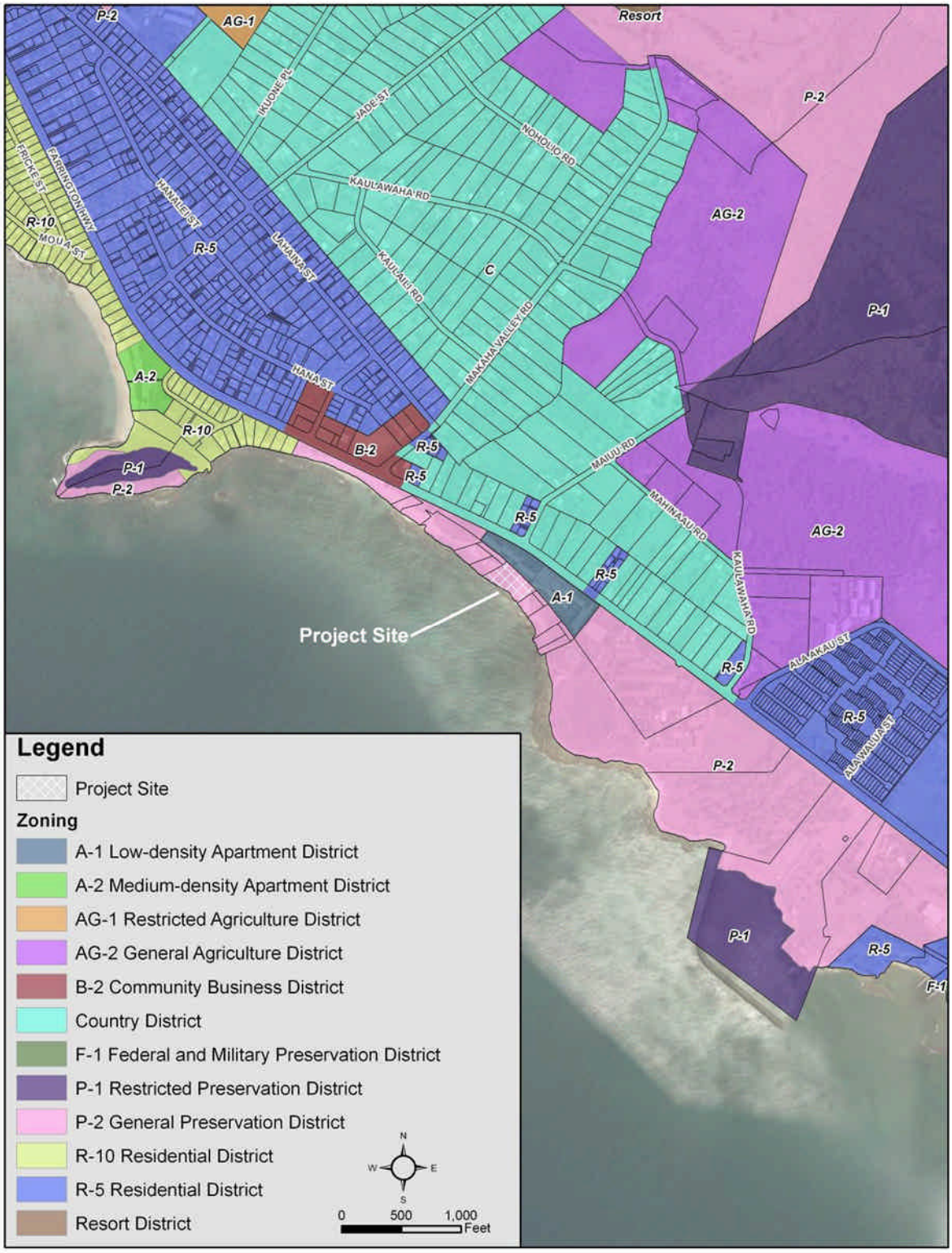


Figure 1-3. City and County Zoning LUO Map

1.4 Identification of Proposing Agency

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: Dayananda Vithanage, P.E., Ph.D., Director of Engineering
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, HI 96813
Phone: (808) 531-3017
Fax: (808) 531-3177

1.6 Identification of Approving Agency

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

Contact: Chris T. Takashige, P.E., Director
Department of Design and Construction
City and County of Honolulu
650 South King Street
Honolulu, Hawai'i 96813
Phone: (808) 768-8480

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 of either an Environmental Assessment (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).

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:

Federal
- Department of the Army, Corps of Engineers Pacific Ocean Division

State Agencies
- Department of Land & Natural Resources
  - Office of Conservation and Coastal Lands
  - State Historic Preservation Division
- Department of Health
  - Clean Water Branch
- Department of Business, Economic Development, and Tourism
  - Coastal Zone Management Program

City and County of Honolulu
- Department of Parks and Recreation
- Department of Design and Construction
- Department of Planning and Permitting

Community Groups or Members:
- Makaha Surfside Association of Apartment Owners (AOAO)
- Waiʻanae Coast Neighborhood Board No. 24
- Mr. Alika Silva
- The Badayos Family
- Mr. William Aila

List of Agencies that Received Copies of the Mauna Lahilahi Rock Revetment Draft Ea for Review and Comment

U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
Land Division, Department of Land and Natural Resources
Clean Water Branch, Department of Health
Coastal Zone Management Program, State Office of Planning
Department of Planning and Permitting, City and County of Honolulu,
State Historic Preservation Division, Department of Land and Natural Resources
Department of Hawaiian Home Lands
Office of Hawaiian Affairs
Water Resources Research Center, University of Hawaii
U.S. Army Corps of Engineers
National Marine Fisheries Service, NOAA
U.S. EPA, Region 9, Pacific Islands Contact Office
Department of Parks and Recreation, City and County of Honolulu
Waianae Coast Neighborhood Board Number 24
Ms. Kymberly Marcos Pine, District 1 – Councilmember
Makaha Surfside AOAO
Department of Land and Natural Resources, Office of Conservation and Coastal Lands
Senator Maile Shimabukuro
Oahu Burial Council
Representative Jo Jordan, House District 44

2. ALTERNATIVES

2.1 Description of Alternatives

The following alternative erosion control methods were considered before selecting the proposed rock revetment. The structural alternatives will cost from approximately $700,000 to $9,000.

2.1.1 No Action Alternative

The eroded embankment is within 10 feet of the Makaha 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 Makaha Surfside property as it has several times previously. The existing sandbag revetment was intended to be a temporary structure. The sandbag revetment requires expensive periodic repairs and maintenance to provide continued protection. It is not considered a viable long-term solution to backshore flooding and erosion. Further erosion could eliminate lateral access between the north end and south end of the beach park. Flooding of the backshore area would continue to occur during periods of high surf.

2.1.2 Inner Breakwater

One of the alternatives considered is a second short breakwater that would 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 inner breakwater will partially intercept the waves that are entering the area on the north end of the cove. The breakwater would be placed to allow free flow of water in and out of the protected area. Additional sand could 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.

2.1.3 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 coral, live in the cove.

2.1.4 Vertical Seawall

A vertical rock or concrete seawall could be constructed to extend above the existing embankment for the purpose of stopping wave overtopping. However, to be stable, the seawall would require a deep foundation. Digging the foundation trench would remove substantial soil and hard substrate. Lateral access along the shoreline would be reduced. Incoming waves would reflect off the seawall possibly causing additional beach erosion. A rock toe could be placed on the seaward side of the wall to reduce wave energy, but a rock revetment would work better. A vertical seawall could have less impact on nearshore marine life, but is not considered to be esthetically attractive or the most effective method of shoreline stabilization.

2.1.5 Shore Protection Rock Revetment

There is a temporary sandbag revetment built along the shoreline to minimize erosion of the lateral access path and the Makaha Surfside property. This alternative will replace the sandbag revetment with a properly designed rock revetment. To be effective in stopping waves, a rock revetment would have to be moved seaward and built higher to dissipate the wave and to allow for run-up water to return back to sea. The objective of a revetment is to minimize property damage caused by waves that enter the cove and overtop the embankment.

3. PROJECT DESCRIPTION

3.1 Selected Alternative Description

A rock revetment along the inner shoreline is the selected alternative. The revetment will extend seaward from the shoreline to slow and drain water from overtopping waves. The revetment will run from the northwest corner of the cove to a point past the southern gate at the Makaha Surfside. The revetment will be constructed with available armor stone. A filter of smaller stones and geotextile fabric will be placed under the revetment to minimize sand/soil loss from the backshore area.

3.2 History of Project Area

The project area is in a small cove or pocket beach fronting the Makaha Surfside Apartments. Park area between the Makaha 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 since 1949. 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). A rock 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 stable until some time after 1949 when the beach 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 Makaha Surfside Apartments and eroded much of the beach 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 (Preservation 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, if it could be used for apartments, would be about $2 million. The top of the bank eroded through the fence into the Makaha 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 shoreline erosion and reduce property damage caused by waves that enter the cove at the south end of Mauna Lahilahi Beach Park. In 2011, the City and County of Honolulu (CCH) decided to construct a new rock revetment along the inner shoreline of the cove across from the gap in the existing breakwater. The proposed revetment is discussed in Section 3.4. Alternatives to this revetment are given in Section 2.

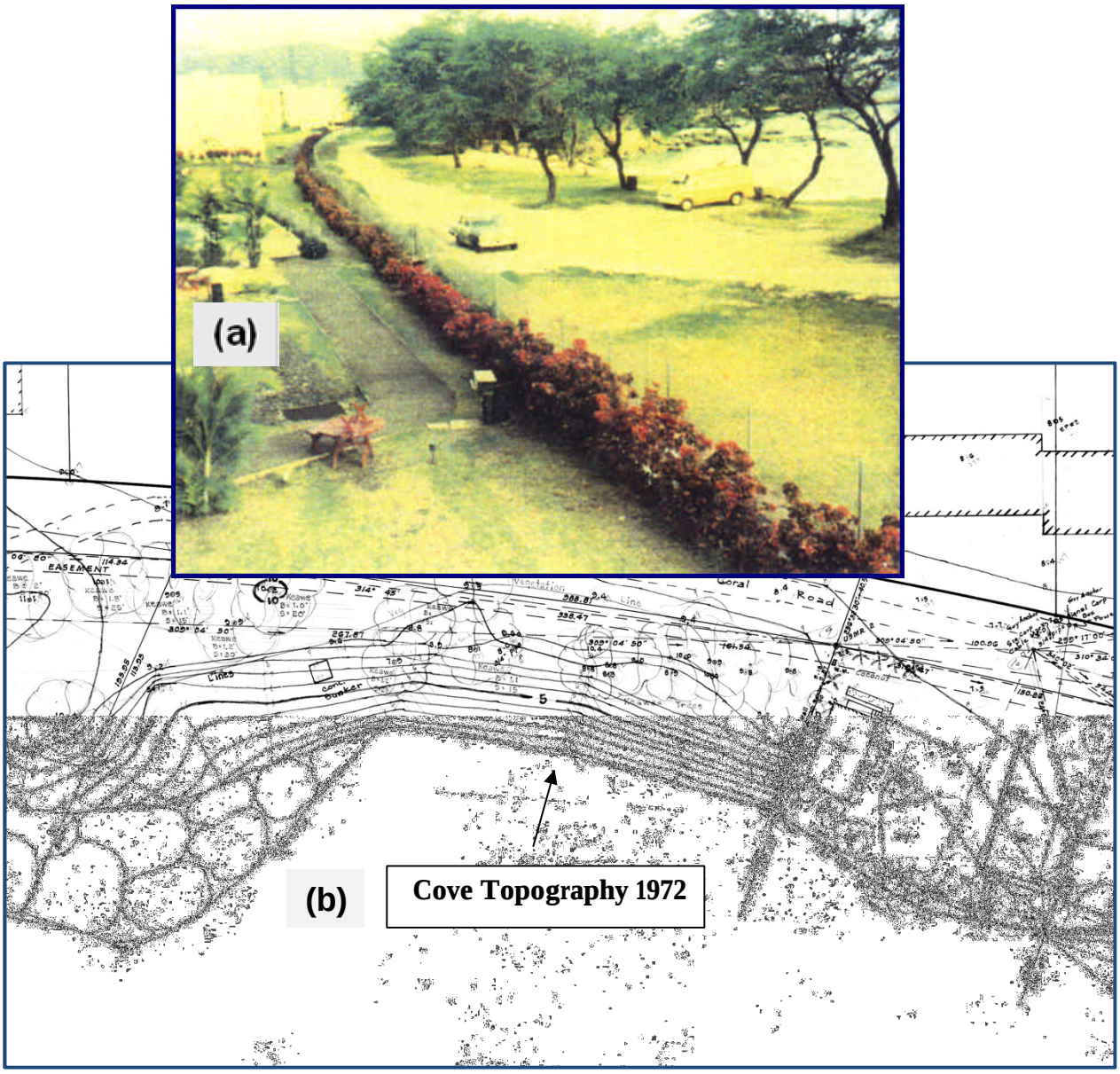


Figure 3-1 (a) Mauna Lahilahi Cove Beach in 1970, (b) Topographic Map in 1972 (Division of Land Survey & Acquisition);

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

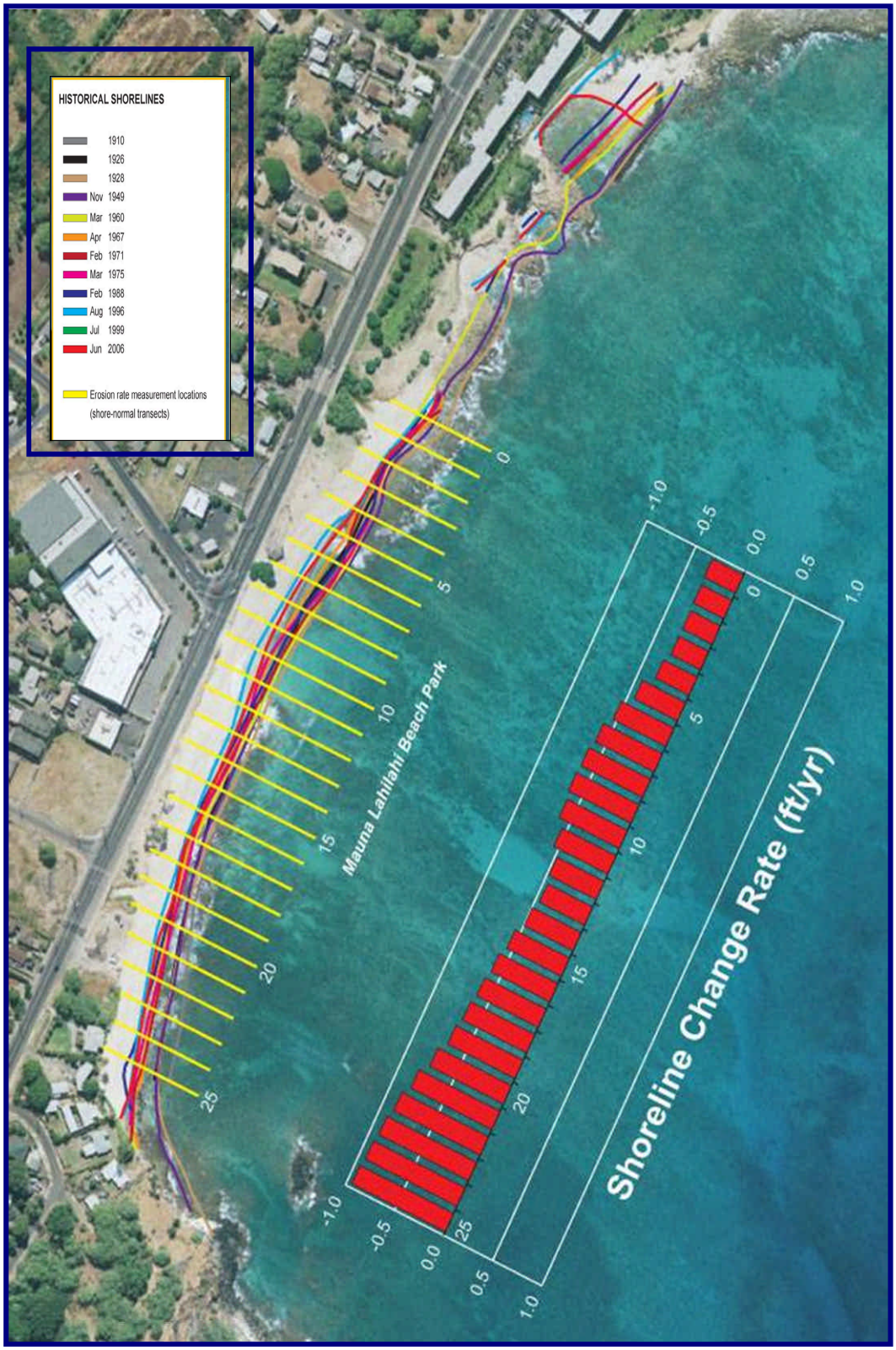


Figure 3-5. Shoreline Erosion Rates

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

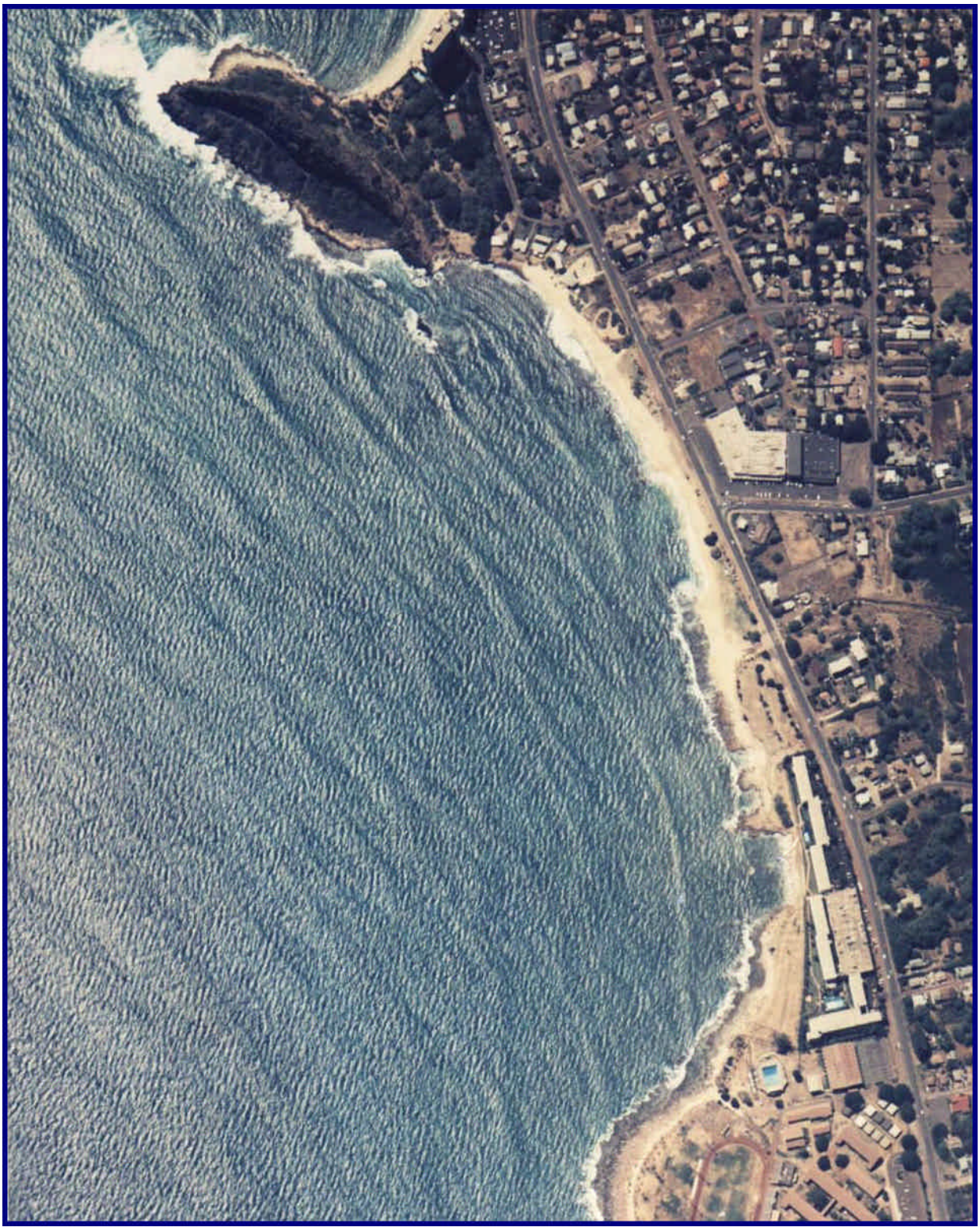


Figure 3-7. Aerial Photo of Mauna Lahilahi Beach Area from 1994

Figure 3-8. Mauna Lahilahi Beach Area in 2006 after Outer Breakwater Construction
(University of Hawai'i, 2006)

Figure 3-9. 2006 Aerial Photo 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

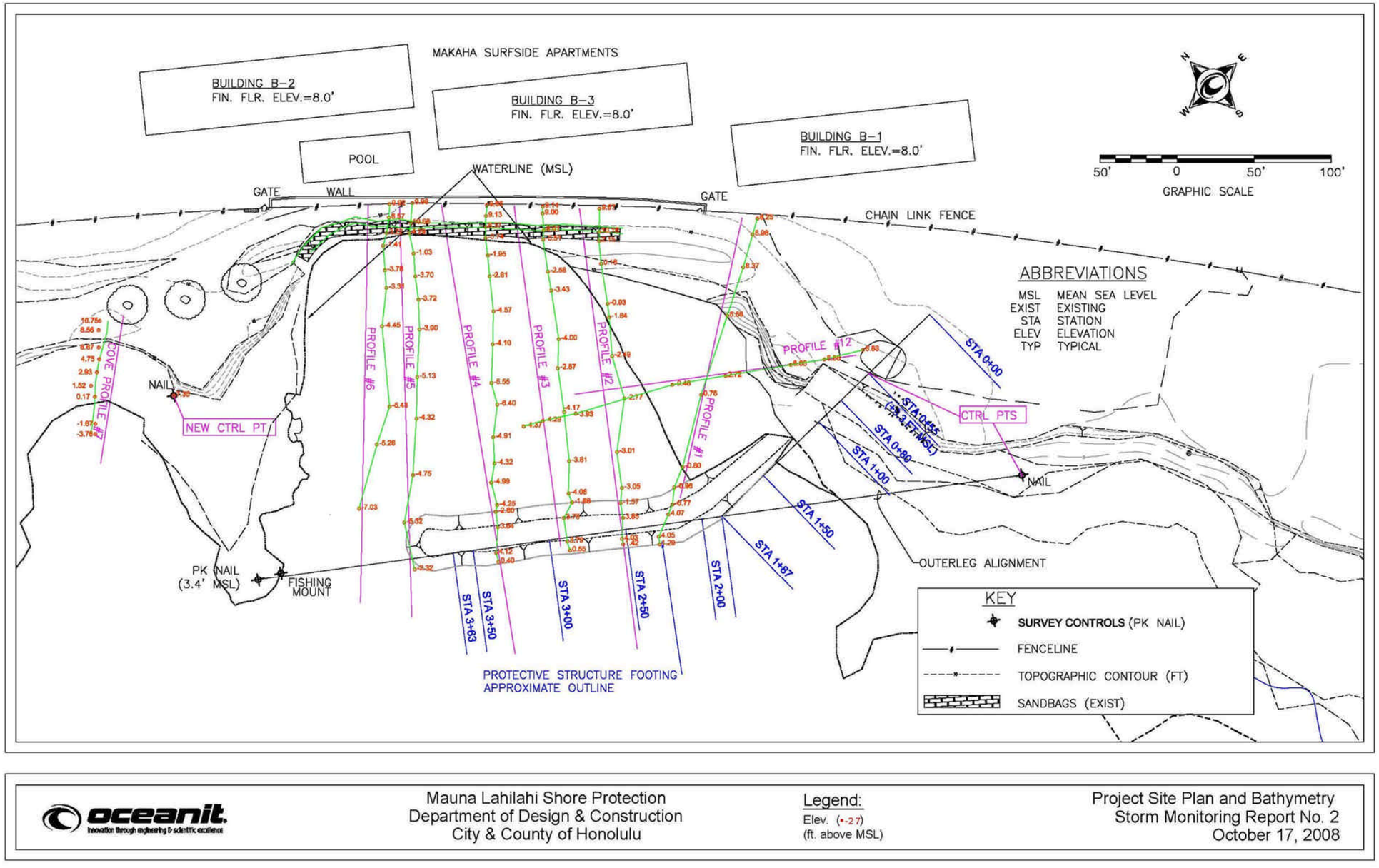


Figure 3-11. Project Site Plan and Bathymetry

3.4 Design and Construction of Proposed Project

3.4.1 Site Technical Description

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 buoy data from 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 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).

3.4.2 Rock Revetment Design

The rock revetment was designed using methods determined by the US Army Corps of Engineers (USACE) and by calculation methods described by experts in coastal engineering. Design Software originally produced by the USACE, called the Coastal Engineering Design and Analysis System (CEDAS), was used. Wave data from buoys near Oahu and from the USACE Wave Information System (WIS) were used as input to the model. The CEDAS software calculated wave transformation from deep water to the project site. A design wave was selected and used to calculate the size of armor stones for the revetment and to calculate wave runup and overtopping of the revetment. A category 4 hurricane was assumed to be the worst case condition. A tsunami could cause more damage, but a shoreline structure designed for tsunami would likely be prohibitively expensive and far too large to be practical.

Water depth at the opening of the cove is approximately 6 feet below mean sea level (MSL). Design water elevation for the revetment was determined to be 6.2 feet MSL (rounded). This water level was calculated by adding the high tide (1.08 feet MSL), potential wave setup (4.85 feet), and the estimated sea level rise over the 50 year design life of the structure (0.245 feet).

These conditions were used to calculate a design wave height from a hurricane of 5.5 feet (assuming the breakwater was gone). This wave height was used to calculate breakwater rock size with USACE formulas.

The revetment will be constructed of two layers of armor stone, two layers of bedding stone, and a fabric filter layer to minimize soil from piping through the revetment into the water. The armor stones will weigh approximately 1.5 tons each and have a nominal diameter of 2.6 feet. The bedding layer stones will weigh approximately 300 pounds each and have a nominal diameter of 1.2 feet.

The revetment will be wider at the north end where waves entering through the breakwater gap have overtopped and damaged the sandbags and eroded the backshore area (Figures 3-12 and 3-13). By moving the revetment seaward and building a rock and gravel drainage or splash area behind the revetment, overtopping waves can drain back into the ocean with minimal damage to the backshore property.

3.4.3 Rock Revetment Construction

Construction is expected to take 2-3 months. Primary site access for construction equipment will be from Waiʻanae High School to the south. Alternate site access, if needed, will be from the north side of the Makaha Surfside. Access will be shown on construction plans (see Figure 3-14). Plans and specifications will indicate that no grading or grubbing is allowed and that all ground surfaces beneath stockpiles 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 Hawaiʻi Department of Health 401 Water Quality Certification.

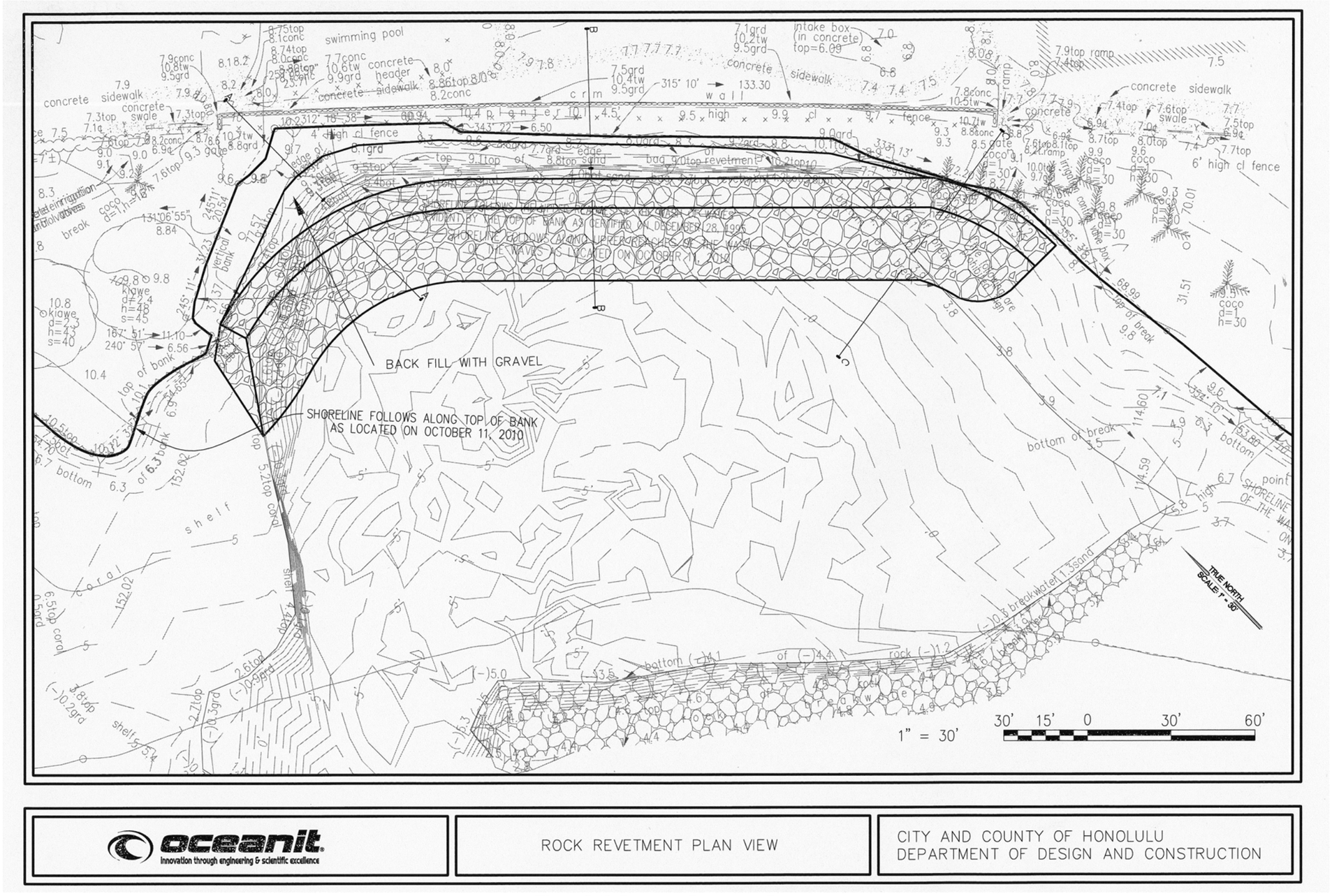


Figure 3-12. Proposed Revetment Plan

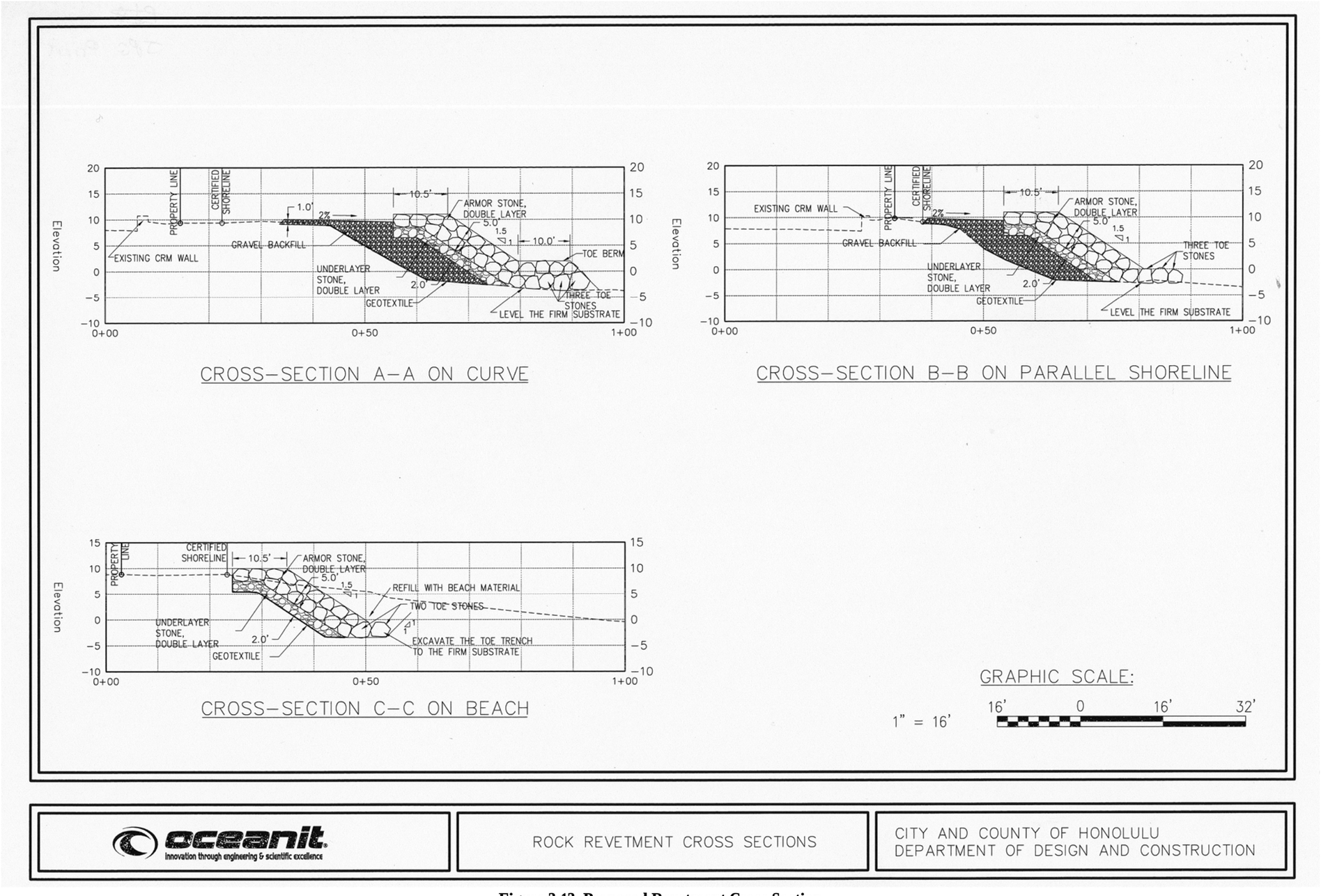


Figure 3-13. Proposed Revetment Cross Section

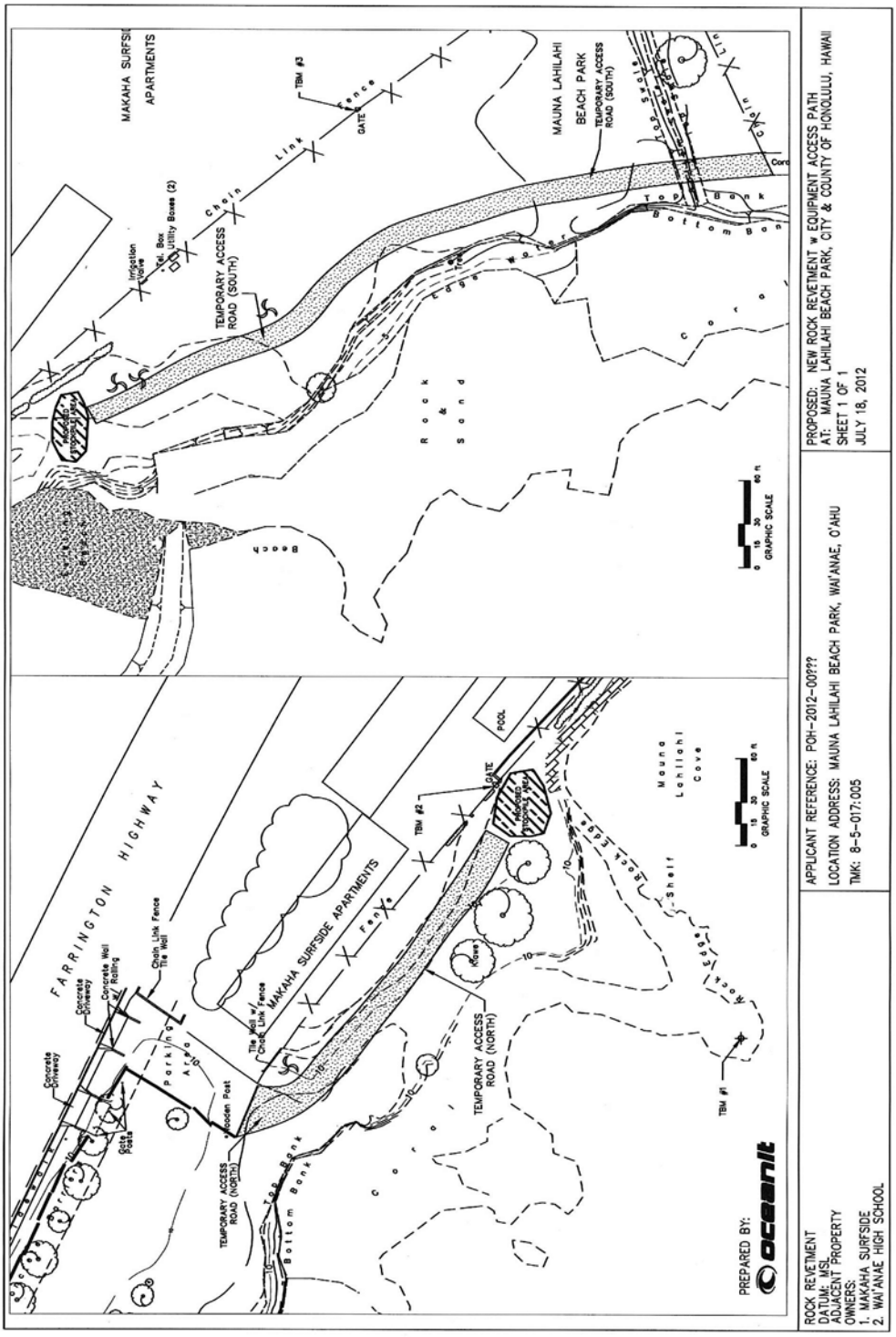


Figure 3-14. Construction Equipment Access

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 Makaha Surfside Apartments. The threatened beach park area is about 1.5 acres with a value of approximately $32,200. The Makaha Surfside land of approximately 5.5 acres has an assessed value of over $10 million. Since the beach park and the Makaha Surfside Apartments are not the within the same zone, the values are assessed differently. The Makaha Surfside land is a commercial property, which is assessed higher value per square foot than the beach park and conservation land.

A portion of the beach park and a sand beach would not be usable without the existing breakwater and nourished sand beach. 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. The proposed new structure will better preserve the park area and better protect the Makaha 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.

Oceanit met with the neighborhood board in 2000 prior to construction of the existing breakwater. There were some concerns about fishing and gathering. The new revetment will probably not provide much habitat for edible marine species, because the water is very shallow. The revetment rocks will provide only small surface areas for settlement of benthic organisms. Wave action will be continuous at the revetment's north end. Spaces between the armor stones will provide limited cover for some marine life.

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. The State Historic Preservation Division identified the "cultural layer" as site 4064, a buried habitation site complex with associated burials.

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 the area. Studies by the State Historic Preservation Division (SHPD) indicated that the entire flat, sandy soil area of Mauna Lahilahi Beach Park, south of a canal across from the old Coronet Store, is a historic site of significance (site 4064). 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 writing the 2001 environmental assessment for the existing breakwater, 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 contacted in 2000 included: Hui Malama I Na Kupuna ʻO Hawaiʻi 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 archaeological study conducted by Cultural Surveys Hawaiʻi 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. The proposed project would reduce some of the shoreline erosion.

Oceanit previously (2013) worked with the City and County on a project to design protection for cultural and archaeological sites found near the breakwater work site. This cultural protection project involved coordination and work with cultural experts and some of the same community members contacted earlier. As part of this project, in 2010 a City Department of Design and Construction representative, Oceanit employees, and Mr. Aki Sinoto, a consulting archaeologist, met with members of the Badayos family to discuss their former family home site and burials in the area. The Badayos sisters were not aware of any members of their immediate family who were buried at the site.

The City and County of Honolulu conducted the Mauna Lahilahi Beach Park Improvements Project starting in 2003. The final archaeological monitoring report for the project was published in January 2009.

Based on correspondence and discussions with SHPD, an archaeological monitoring plan will be prepared and archaeological monitoring will be conducted during construction of the new revetment. The monitoring plan will include consideration of existing, known archaeological and cultural sites at the beach park. Because of the cultural sensitivity, a minimum of one monitor will be on site for each piece of construction equipment. Access and staging for construction equipment will be planned based on the known sites. Access plans are included with the construction design plans and are shown in Figure 3-14. The monitoring plan must be approved by SHPD prior to construction. Previous and recent correspondence with SHPD is included in Appendix B.

5. DESCRIPTION OF AFFECTED ENVIRONMENT

5.1 Ocean/Coastal Environment

5.1.1 General

The coastal shoreline of Waiʻanae 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.

Waiʻanae'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 Waiʻanae 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 Makaha Surfside during both hurricanes. 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 porous breakwater regularly transported 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 re-establishing a new beach where one was lost years ago.

The construction of a rock revetment will reduce erosion of the cove's inner shoreline and backshore area. The revetment will also reduce wave overtopping and runup on the backshore area.

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 3.4.2.

5.1.4 Currents and Circulation

Currents on the Waiʻanae 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 (Waiʻanae Boat Harbor Final EIS, 1976).

5.1.5 Tides

In Hawaiʻi, 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 (Ref NOAA Tides and Currents web site).

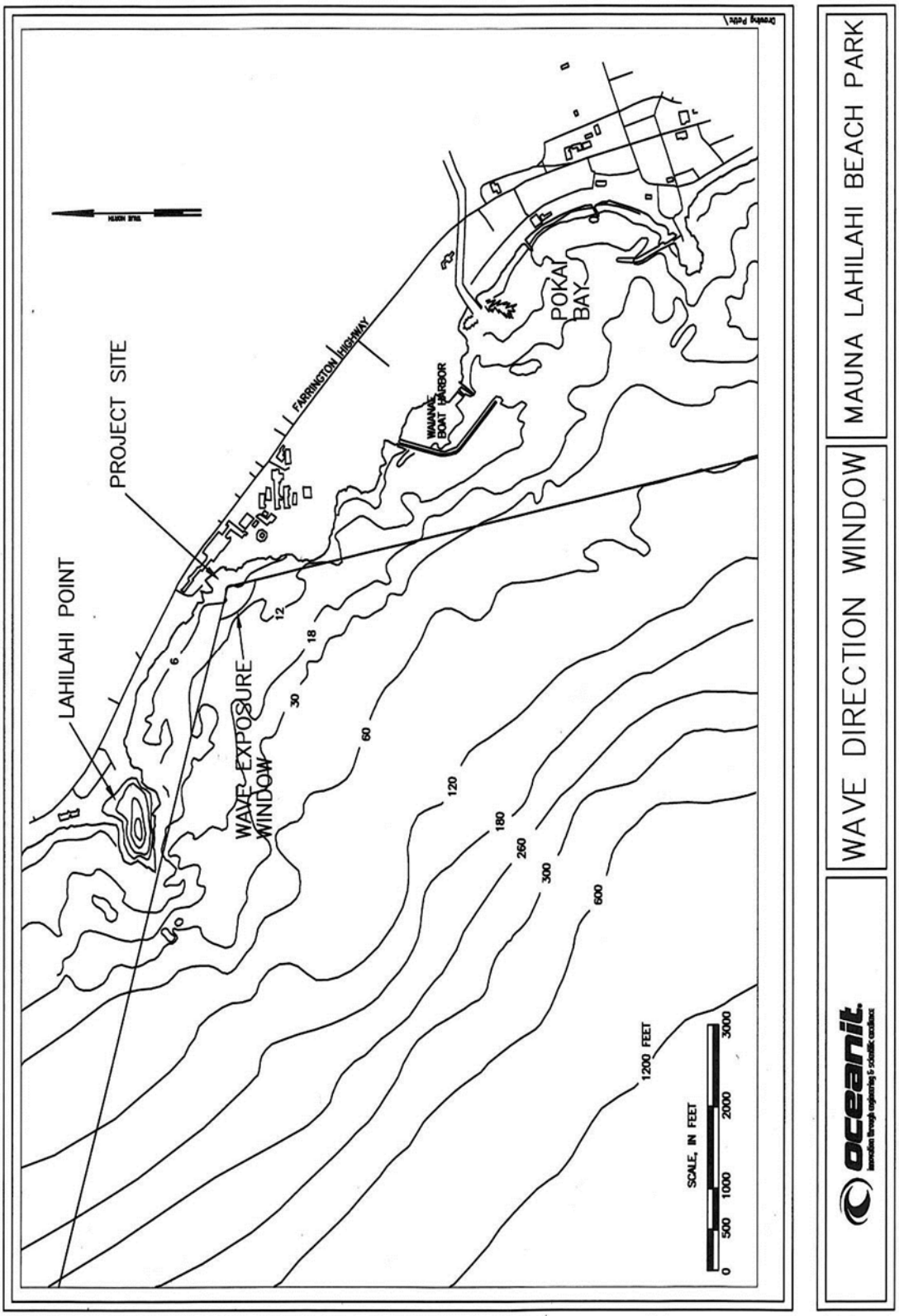
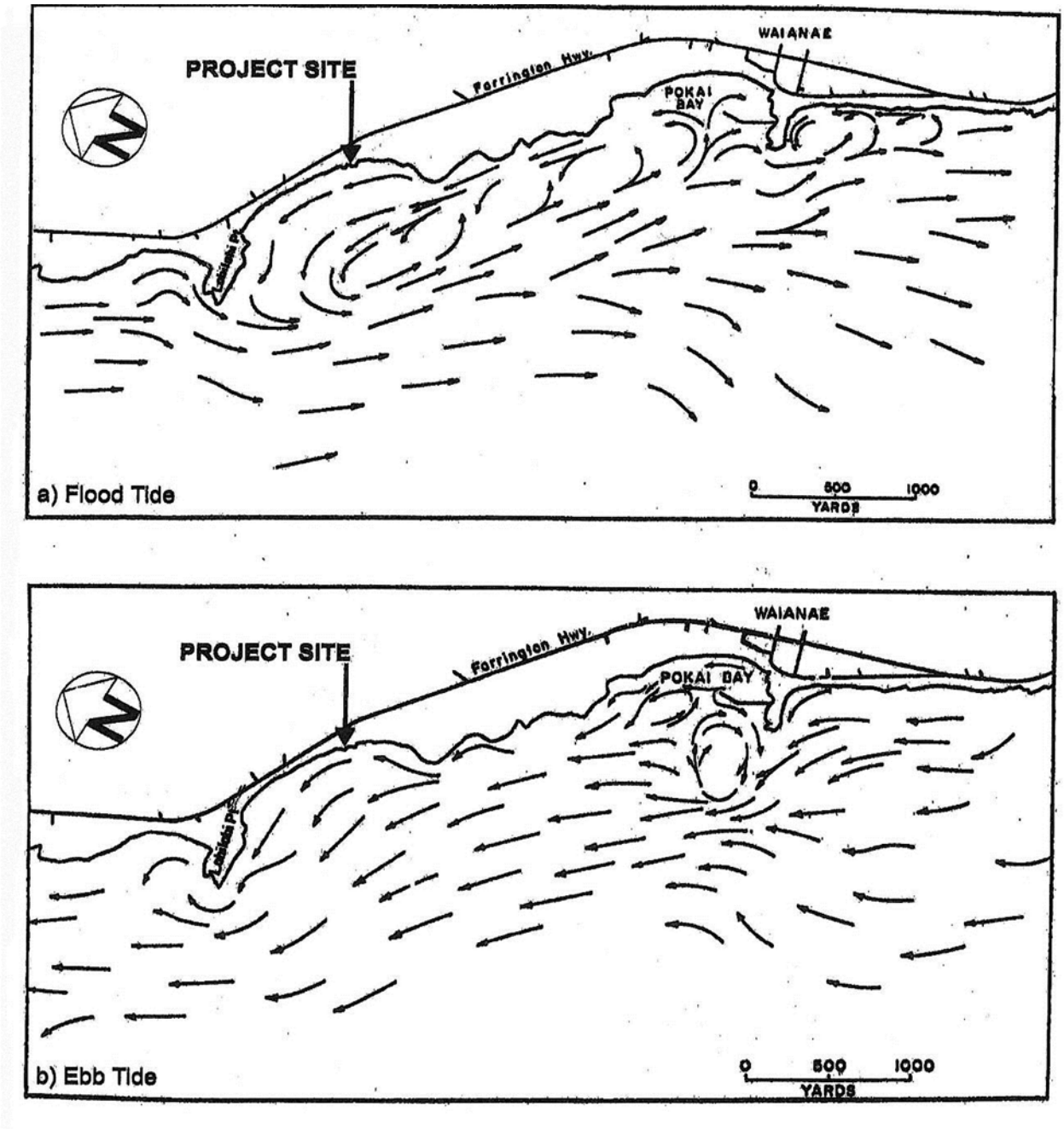


Figure 5-1. Wave Direction at Project Site



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

Waiʻanae 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 ʻEku Stream to the north and drainage ditches, 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 (NH4) [samples #2, 3 & 4], and turbidity [sample 1].

Table 5-1. Water Quality Results

		SAMPLE #			
Parameter	Units	1	2	3	4
PO4	(? g/l)	4.34	5.27	7.13	4.34
Nitrates + Nitrites	(? g/l)	1.96	4.06	6.30	6.30
NH4	(? g/l)	2.52	3.08	5.32	3.78
Tot. Phosphorus	(? g/l)	12.09	11.47	13.33	11.16
Tot. Nitrogen	(? g/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	(? g/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). The investigation included a coral survey that extended from the shoreline to about 280 feet offshore. The closest coral found was approximately 90 feet offshore, which is outside the footprint of the proposed revetment. Additional information on the marine environment can be found in the Final Environmental Impact Statement, Waiʻanae Boat Harbor, Waiʻanae, Oʻahu, Hawaiʻi (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 office. 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 were 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 Oʻahu. Average temperatures (Fahrenheit) in Waiʻanae 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 Waiʻanae 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 Waiʻanae Boat Harbor and Pokaʻi Bay. Mauka lands of the Waiʻanae 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 Waiʻanae 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 Oʻahu.

5.2.3 Visual and Open Space

The project area as viewed from the Makaha Surfside Apartments includes the Pacific Ocean to the south and west and Kamaile ʻunu Ridge of the Waiʻanae 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, ʻEku Stream, exits a few hundred feet north of the site under a highway bridge and the other exits

south of the Waiʻanae 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 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. Figure 5-4 is the Flood Insurance Rate Map for the project area.

Although hurricanes occur infrequently in Hawaiʻi, they occasionally hit the islands. Hurricane Iwa in 1982 and Hurricane Iniki in 1992 resulted in significant damage on Kauaʻi. Both hurricanes also caused coastal flooding and damage on the leeward coast of Oʻahu, including the Makaha 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). The bottom floor of the Makaha Surfside was severely damaged by both hurricanes.

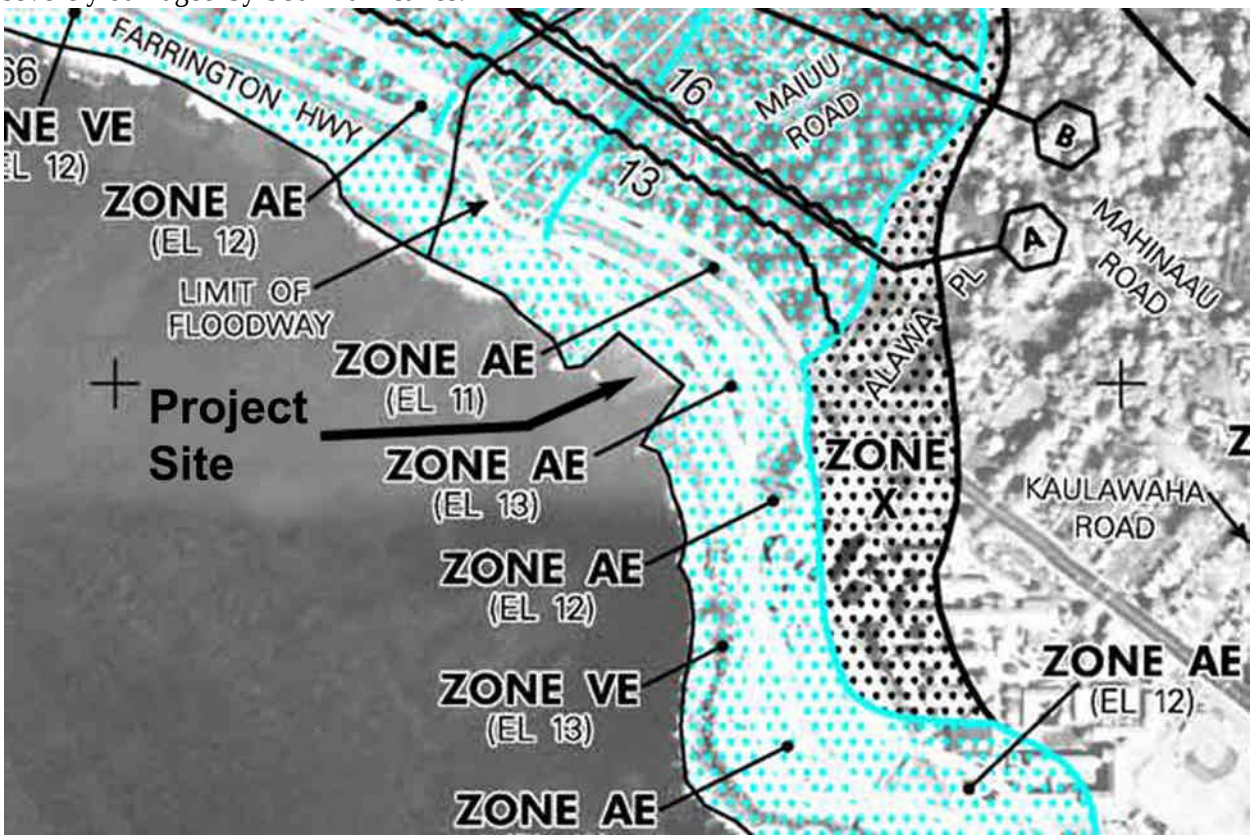


Figure 5-4. FEMA Flood Map

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 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 Waiʻanae 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 kolea]), 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 many known burial locations in the park on either side of the project site (discussed in Section 4.2). 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. The City and the Hawaiian community are evaluating preliminary burial treatment plans for exposed remains. Construction of a revetment will likely require a monitoring plan and monitoring during any excavation or movement of beach sand.

5.2.9 Noise

The major source of noise in the area is Farrington Highway, located approximately 300 feet mauka (inland) from 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 Waiʻanae 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 Oʻahu. Farrington Highway serves local traffic within the Waiʻanae area and acts as a commuter highway for trips outside of Waiʻanae. 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 revetment site. The beach park does have irrigation systems, and the Makaha Surfside Apartments have utilities.

6. CONFORMANCE WITH PLANS AND POLICIES

6.1 Hawai‘i State Plan and Functional Plans

6.1.1 Background

The Hawai‘i State Plan was developed to serve as a guide for future development of the State of Hawai‘i 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 Hawai‘i 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 revetment 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 (see Figure 3-14). An archaeological 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 eroding shoreline areas in Wai‘anae’s Mauna Lahilahi Beach Park by constructing a rock revetment. By building the revetment, lateral access along the shoreline will also be preserved. Without the planned revetment, there most likely will not be any good lateral access between adjoining park areas.

6.1.4 Housing

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

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

The eroding beach is immediately in front of the Makaha 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 revetment 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 protect the back shore area from erosion and potential damage to property.
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.

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 Oʻahu. Mauna Lahilahi Beach Park is a major beach park in Waiʻanae. The wave erosion at the project site has already caused major damage to the park.

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 Waiʻanae 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 revetment project will provide necessary protection against erosion. This will allow safer and more convenient access to the beach and public park land in this area.

6.3 Hawaii Coastal Zone Management (CZM) Act, HRS Chapter 205A

6.3.1 Objectives

The objectives of Chapter 205A include among others:

(1) Recreational resources;
  (A) Provide coastal recreational opportunities accessible to the public.
(2) Historic resources;
  (A) Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.
(3) Coastal hazards;
  (A) Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.
(4) Beach protection;
  (A) Protect beaches for public use and recreation.

The objectives are met as follows:
Objective (1) - Lateral access along the shoreline is currently provided by a sandbag revetment along the inner shoreline of the cove. The rock revetment will replace the damaged sandbag revetment.
Objective (2) - The protected area contains known ancient Hawaiian burial sites and a cultural layer below the surface.
Objective (3) - The proposed shore protection also protects an apartment complex that has been damaged by hurricanes and by high winter waves. The existing breakwater currently protects the buildings from wave flooding at the project's south end. Before the existing breakwater was constructed in 2003, waves washed over the top of the bank and ran down to threaten the bottom floor of the building. That no longer happens. The new revetment will provide similar protection at the north end of the cove.

6.4 Waianae Sustainable Communities Plan

6.4.1 Objectives

One of the General Policies Pertaining to Coastal Lands is **3.3.2.3 Shore Armoring Discouraged** that states that seawalls, groins, and breakwaters should generally be discouraged.

The eroded area is in a county beach park where the beach had been totally lost. A nourished beach and breakwater was built in 2003. But sections of the shoreline continue to suffer from wave overtopping and inland damage. The proposed revetment will minimize further erosion and damage.

7. IMPACTS AND MITIGATION

7.1 Direct Impacts

7.1.1 Marine Flora/Fauna

The proposed rock revetment will cover an area approximately 300 feet long and 40-45 feet wide. The area is mostly hard substrate with sand and rubble and has been partially covered by the existing sandbag revetment for over 10 years. As discussed in Section 5.1.7., the closest live coral to the shoreline was about 90 feet offshore, which is outside the footprint of the proposed revetment. No other benthic flora or fauna are likely to survive under the revetment footprint. The loss of any benthic habitat and associated organisms is partially mitigated by the new habitat represented by the rock structure itself. There may be some habitat for crevice dwelling species such as crabs and habitat for algae.

A green sea turtle was sighted only once during 5 years of monitoring (2003-2008), so no negative impact to the sea turtle population is expected after construction is complete. During multiple site visits, the project team did not see a Hawaiian Monk Seal. The project's Best Management Practices Plan includes *NOAA Mitigation Measures to Reduce Impacts to Protected Species.*

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

7.1.2 Terrestrial Flora/Fauna

Naupaka grows along the fence bordering the Makaha Surfside. The naupaka will probably be damaged during construction and may have to be replanted after construction. Grass and shrubs growing in the park will likely be damaged by construction vehicles. The vehicles will be routed around major trees such as coconut trees or kiawe trees. Some landscaping will probably be necessary when construction is finished. The open shoreline and park area does not offer much habitat or dwelling space for land mammals, and no terrestrial animals were observed during multiple park visits. No sand dwelling birds were observed on field reconnaissance visits. Birds that use the park may be disturbed by construction. The proposed project should have no significant long-term impacts on flora or fauna within the park.

7.1.3 Water Quality

During revetment construction, suspended sediment levels may be temporarily elevated in water immediately adjacent to the operations. Construction specifications call for the contractor to clean all stone before placement in the water 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 be submitted to the Corps of Engineers and State of Hawaiʻi Department of Health (DOH) Clean Water Branch. The contractor will be required to enclose the immediate work site with sandbags for water quality control and to monitor turbidity during construction. The sandbag structure is included in construction plans and BMPs.

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. Offshore current patterns are shown in Figure 5-2. Circulation at the site is good. Water now flows both in and out through the breakwater voids and through the gap between the breakwater and the hard shoreline. The new revetment will reduce wave reflection, but circulation through the breakwater rocks and breakwater gap will continue.

7.1.5 Traffic

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

7.1.6 Air Quality

Fugitive dust from hauling and placing rock, exhaust emissions from vehicles, and possible traffic disruptions may temporarily degrade air quality at the project site. Dust concentration is anticipated to be low based on previous experience with the existing breakwater. The contractor will control construction dust by applying water to stock piles and work areas. The contractor will be required to comply with City and County of Honolulu and State Department of Health regulations for dust concentration during the construction period.

7.1.7 Noise

During revetment construction, trucks and rock handling equipment will generate higher than normal noise levels during the work day. Residents of the Makaha Surfside will be able to see and hear the equipment. The Surfside buildings will block noise from residents across Farrington Highway. Mitigation of vehicle noise to inaudible levels is not possible. Construction equipment will use mufflers. Construction will be restricted to daytime hours.

7.1.8 Runoff

The proposed revetment will be porous and will allow rainwater or wave overtopping to drain easily through gravel, rock, and fabric filter. The revetment will not hold water or divert runoff that might cause erosion. No impact on existing drainage is expected from the proposed action. Rainfall during construction may wash sediment into the ocean. The contractor will be required to provide a site specific best management plan for review by county, state, and federal agencies.

7.1.9 Archaeology

The beach park contains a significant 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). A new archaeological monitoring plan will be prepared for revetment construction and an archaeologist will be hired to monitor construction. 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. If required by the State Historic Preservation Division, areas of heavy equipment use will be protected by steel plates. Section 11 has a list of related reports. If burials or cultural artifacts are discovered during construction, work will be stopped and appropriate county and state agencies will be notified.

7.1.10 Surf

No surfing has been seen near the project during numerous visits over many years. The nearest surfing site is down the coast at Mauna Lahilahi Point. The proposed revetment and existing breakwater are in water much too shallow for surfing waves. Impacts to surfing are not expected.

7.1.11 Beach Use

Beach use and lateral access at the revetment site will be curtailed during the construction period. This disruption will be temporary. The main Mauna Lahilahi Beach will not be affected by construction and will be open for public use.

7.1.12 Erosion

The shoreline at the project site, formerly a sand beach, has been eroding for more than 50 years. The previous beach is gone, and the backshore area has been overtopped and damaged. The revetment will significantly reduce backshore erosion within the project area. The nourished beach placed in 2003 will continue to slowly lose sand, and sand will be transported through or around the breakwater. If desired, additional sand could be placed on the beach in the future to mitigate loss.

Post construction monitoring of the structure and surrounding beaches may be required by the permitting agencies. Periodic visual inspection should be sufficient to determine revetment performance.

7.2 Indirect and Cumulative Impacts

7.2.1 Nearshore Marine Life

No significant change in nearshore marine life is anticipated after the site settles. The new revetment will replace the existing sandbag revetment that occupies approximately the same location. Some marine life such as crabs or algae may inhabit the new revetment.

7.2.2 Water Quality

The revetment will prevent erosion of backshore soil and clay, which over the long term, should help reduce turbidity related to erosion. Some turbidity is expected during construction, and the contractor will be required to use best management practices and to monitor water quality. No long-term water quality degradation occurred after the existing breakwater construction and none is anticipated for revetment construction.

7.2.3 Visual and Open Space

As stated in Section 5.2.3, the public beach area adjacent to Mauna Lahilahi Point contains significant stationary visual resources. The new revetment will occupy the same position as the existing sandbag revetment and will be below the view plane for people walking along the top of the bank. The project will have no 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 Makaha Surfside Apartment buildings block coastal roadway views of the ocean. The proposed revetment 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 new revetment should cause very little change to the recreational use and safety of the beach. Wet revetment rocks may be slippery, but access to the water is easy over the nourished beach. Water depth is shallow and will remain shallow. The beach is protected from waves by the existing breakwater. There will be a lateral access path along the top of the revetment. There are no lifeguards at this location.

7.2.5 Noise and Air Quality

Long-term noise and air quality will not be changed by the proposed action. There will be temporary 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. The contractor will provide traffic control as needed.

7.2.7 Archaeology

The revetment will reduce erosion of backshore soil, which should help protect burials and other cultural 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 Erosion

The cumulative impact on shoreline erosion will be positive. Erosion and wave overtopping will be reduced by the new revetment, which is the purpose for the project. The new revetment will not cause coastal erosion at other locations in Mauna Lahilahi Beach Park, because it is contained in a cove pocket beach with rock headlands extending seaward on each side. The headlands minimize long shore currents and sand transport. Before the beach was nourished in 2003, nearly all of the sand had eroded out of the cove and moved laterally in both directions along the shoreline. Sand eroding from the main Mauna Lahilahi Beach to the north does not appear to be accumulating in the cove. The nourished sand in the cove is protected by the existing breakwater, and the nourished beach remains. There are no nearby beaches between the south side of the cove and the Wai`anae Boat Harbor.

8. PERMITS

8.1 Permits and Approvals Required

1. Department of the Army Section 10/404 permit
2. State of Hawai'i Department of Health, Section 401, Water Quality Certification
3. Department of Business, Economic Development and Tourism, Office of Planning, Coastal Zone Management (CZM) Federal Consistency
4. Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands, Conservation District Use Permit
5. DLNR Historic Preservation Division Chapter 6E-8 Historic Preservation Review

Backfill for the planned revetment will extend close to the certified shoreline. However, neither a Special Management Area (SMA) Use Permit nor a Shoreline Setback Variance (SV) are required, since the work area is seaward of the certified shoreline.

At the request of the State Historic Preservation Division, an archaeological monitoring plan will be prepared and submitted for approval.

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" have 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 revetment will cover a small portion of the underwater bottom near the water line. This area is hit by breaking waves and is continually scoured by turbulent water and sand. While the covered habitat will be changed, the rocks used for revetment construction may add habitat for crabs or other shoreline life. The revetment will partially protect cultural or historic resources, including burials.

2. Curtails the range of beneficial uses of the environment;
The new revetment will replace an existing sandbag revetment. No change in beneficial uses of the environment is anticipated.

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 areas for public recreational uses.

4. Substantially affects the economic or social welfare of the community or state;
The proposed project will reduce the threat to property damage by waves and flooding. Two hurricanes have badly damaged the relatively inexpensive housing at the Makaha Surfside Apartments.

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;
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 coastal structures, 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 possible 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 revetment is designed to protect inland buildings from erosion and flood damage. However, it is not designed to prevent damage during a tsunami or hurricane. The revetment itself could possibly sustain damage during an extreme event, but a larger rock structure is not recommended because of high cost, size, and aesthetics.

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 Determination

The City and County of Honolulu Department of Design and Construction determined that a Finding of No Significant Impact (FONSI) applies to the proposed action based on the information and assessment provided in this FEA.

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APPENDIX A
Marine Biological Survey
From Final Environmental Assessment for Proposed Shore Protection at Mauna Lahilahi Beach Park, July 2001

Marine Biology Survey 2001

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 1.

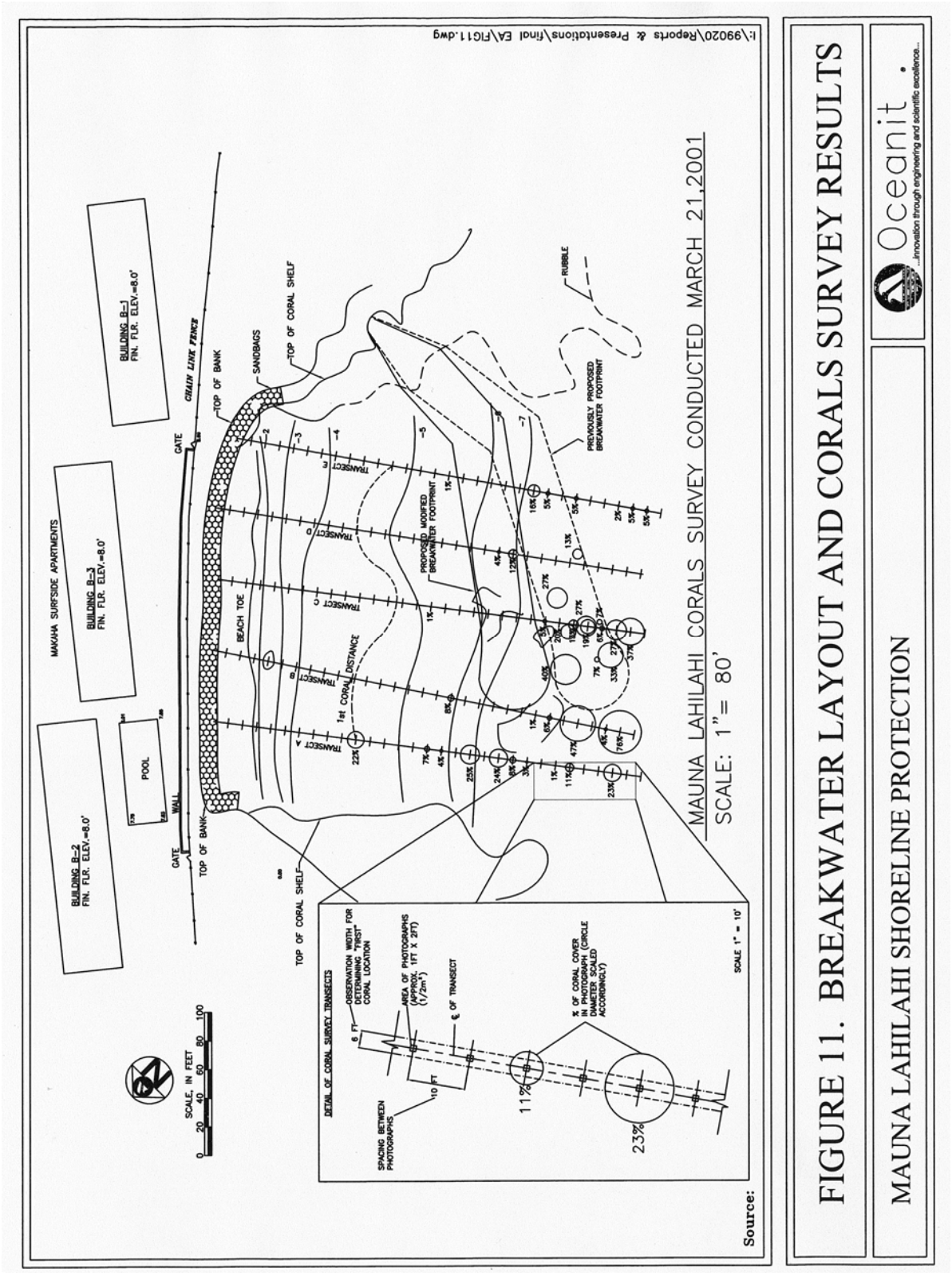

Figure 1. Breakwater Layout and Corals Survey Results

As can be seen in Figure 1 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, Waiʻanae Boat Harbor, Waianae, Oahu, Hawaii (1976).

APPENDIX B:
Correspondence with State Historic Preservation Division

APPENDIX C:
Certified Shoreline Survey

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIAAINA
FIRST DEPUTY

WILLIAM M. TAM
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
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BUREAU OF CONVEYANCES
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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, HAWAII 96707

March 7, 2014

Mr. Chris T. Takashige, P.E., CCM, Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

LOG NO: 2013.3225, 2013.3278
DOC NO: 1403NN03

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Draft Environmental Assessment for Mauna Lahilahi Beach Park Rock Revetment
Māhaka Ahupua'a, Waianae District, Island of O'ahu
TMK: (1) 8-5-017: 005, and portions of :004, 006 and 007

Thank you for requesting our comments on the draft environmental assessment (DEA) in connection with the proposed action to construct a rock revetment to replace the temporary sandbag revetment along the shoreline in order to minimize erosion of the lateral access path and along the Mākaha Surfside property. The DEA was prepared by Oceanit Laboratories, Inc. on behalf of the City and County of Honolulu, Department of Design and Construction, Wastewater Division. The DEA indicates primary site access for construction equipment will be from Waianae High School to the south and possibly from the north side of Makaha Surfside. We received the DEA on May 8, 2013; we sincerely apologize for the delay and thank you for your patience.

Mauna Lahilahi Beach Park Revetment Background

The project area is a small cove off the southeast end of Mauna Lahilahi Beach Park at 85-101C Farrington Highway. Mauna Lahilahi Beach Park is managed by the City and County of Honolulu's Park and Recreation Division while the submerged lands are managed by the State of Hawaii's Department of Land and Natural Resources. Mauna Lahilahi Beach Park has been subjected to wave and shoreline erosion since 1949. In the late 1990s, a sandbag revetment was constructed to stabilize the embankment that had partially eroded into the Makaha Surfside property. In 2003, the existing shore-connected breakwater was constructed to shelter the sand cove fronting the Makaha Surfside apartments. Following beach re-nourishment, the sandbag revetment was removed. However, subsequently the nourished sand has again pushed between the breakwater and the shoreline embankment. This action has left the backshore at the cove's northeast corner exposed to further erosion by waves moving through the gap between the existing breakwater and the rock shoreline. As a result, the access road that ran along the edge of the park property has been lost to erosion, and the sandbag revetment needs rebuilding. The proposed project involves removing the sand revetment and constructing a new rock revetment along the inner shoreline of the cove across from the existing gap in the breakwater.

Historic Properties Background

Our records indicate that this area is known to contain historic properties, including subsurface intact cultural layers (50-80-07-6634, 50-80-07-6592), human burials containing multiple individuals in several areas (50-80-07-4064), a re-internment crypt (R1992-1-001-001), a rectangular alignment (50-80-07-6635), and a remnant of the former Badayos home. The intact cultural layers are located between the middle of the surfside apartments and the northwest drainage of the park, with the uppermost layer beginning at 25 cm below current ground surface (Log No. 2622, Doc. No. 0009RC11). Burials are associated with these habitation deposits, and our office has been monitoring and recording these deposits since 1999. Additionally, our records indicate that the City and County of Honolulu's Park and Recreation Division has provided a re-internment site for human skeletal remains on TMK: (1) 8-5-017:007. Also, the former Badayos residence and the Badayos re-internment site are located on the Waianae High School end of the shoreline area (TMK: (1) 8-5-017:014). Additionally, cultural deposits have been recorded nearby on TMK: (1) 8-5-017:003 and 004, and possibly on TMK: (1) 8-5-001:021 (Cultural Surveys Hawaii, Perzinski 2004).

Of primary concern is that the cultural deposits may exist in the intact sand deposit behind the current sand revetment area. As such, extreme caution is needed not to damage the sandy face protecting any subsurface archaeological deposits that may exist in the area, including human skeletal remains. This concern is heightened by the need for construction and equipment access to extend through an area known to contain historic properties while ensuring this access does not cause slumping of beach faces and exposure and/or damage of buried cultural layers and/or burials.

Recommendations

In an effort to minimize possible impacts on historic properties, we request that the following recommendations be implemented as part of this project:

1. A project specific archaeological monitoring plan should be prepared that meets the requirements specified in Hawaii Administrative Rule §13-279-4, and include:
   a. An explicit machine and equipment access and staging plan detailing all measures and actions that will be implemented to ensure avoidance of cultural deposits and human burials; and
   b. A stipulation that due to the high sensitivity of the area for non-burial and burial historic properties, a minimum of one archaeological monitor will be assigned and on site for every piece of machinery being operated.
2. That the permit not be issued until our office has reviewed and approved the archaeological monitoring plan to ensure it meets the requirements stipulated in HAR §13-279-4 and the above provisions.

We also request that the DEA be revised to include the above information, as well as, the information provided in our division's previous correspondence concerning projects within Mauna Lahilahi Beach Park. SHPD staff are available to assist you during your research.

Please contact Deona Naboa at (808) 692-8015 or at Deona.Naboa@Hawaii.gov if you have any questions regarding this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Oahu Lead Archaeologist

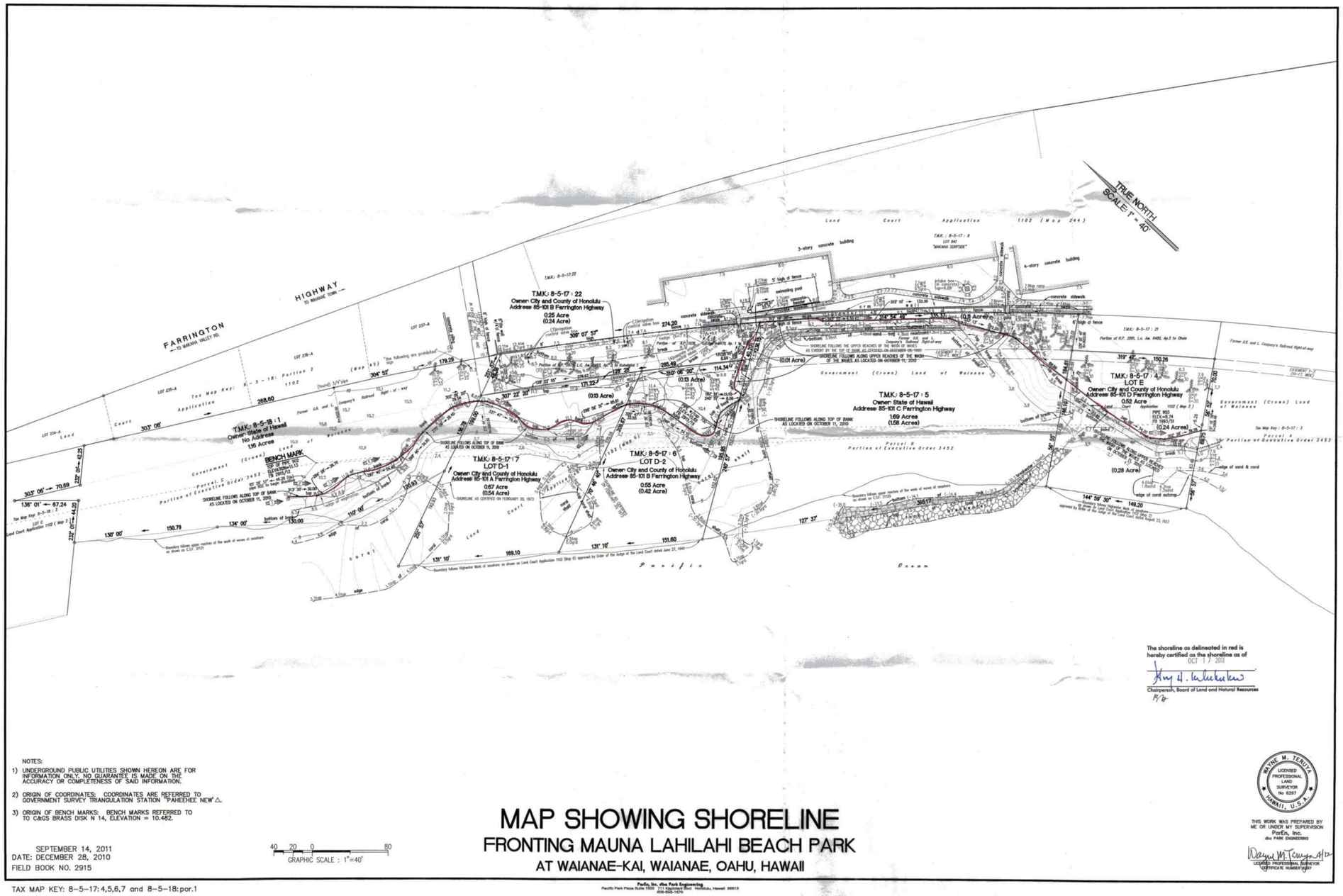
cc:
Office of Environmental Quality of Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Mr. Clifford Lau
Facilities Division
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dayananda Vithanage
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 86816

Toni Robinson, Director
City and County of Honolulu
Parks and Recreation Division
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

Jesse Paahana
Army Corp of Engineers
Regulatory Branch, Honolulu District
Jessie.K.Paahana@usace.army.mil



NOTES:

1) UNDERGROUND PUBLIC UTILITIES SHOWN HEREON ARE FOR INFORMATION ONLY. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION.
2) ORIGIN OF COORDINATES: COORDINATES ARE REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "PAHEEHEE NEW".
3) ORIGIN OF BENCH MARKS: BENCH MARKS REFERRED TO TO C&GS BRASS DISK N 14, ELEVATION = 10.482.

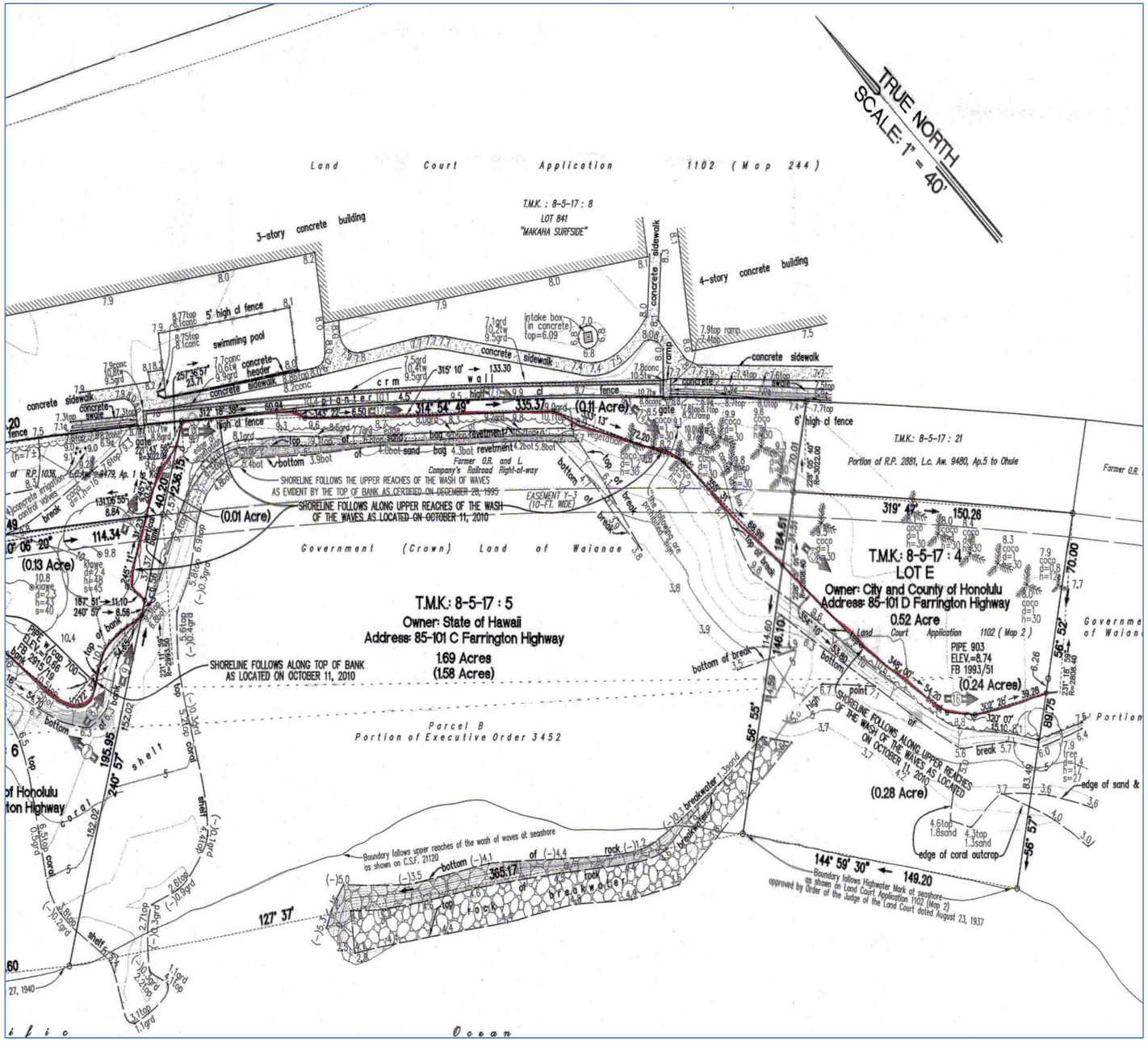
SEPTEMBER 14, 2011
DATE: DECEMBER 28, 2010
FIELD BOOK NO. 2915

40 20 0 80
GRAPHIC SCALE : 1"=40'

MAP SHOWING SHORELINE
FRONTING MAUNA LAHILAHI BEACH PARK
AT WAIANAE-KAI, WAIANAE, OAHU, HAWAII

TAX MAP KEY: 8-5-17:4,5,6,7 and 8-5-18:por.1

ParEn, Inc. dba Park Engineering
Pacific Park Plaza Suite 1600 841 Bishop Street Honolulu, Hawaii 96813
808-682-1876



Certified Shoreline at Project Site

APPENDIX D:
Comment Letters and Responses

June 14, 2013

AL Frenzel
84-933 Alahele St.
Waianae, HI 96792

City and County of Honolulu
Attn: Dept of Design and Construction
650 South King Street, 11th Floor
Honolulu, HI 96813

Subject: Comments regarding Mauna Lahilahi Beach Park Rock Revetment DEA

Dear Sir,

I do not support the project as designed and have the following comments regarding the DEA and project design:

1. The project appears to be for the protection of private property and/or mitigation efforts to correct a botched job that should not have been performed in 2003. Any liability issues the City and County now has regarding the botched 2003 job should be resolved in Court as appropriate and no further mitigation or attempts to correct this botched job should be attempted at taxpayer expenses. The City and County's failure (due to environmentalist pressure) to place the breakwater out further from the cove as originally intended and planned is a lost opportunity and should not be a reason to waste more tax dollars on inferior alternatives to the original plan.

2. The City and County property, which is allegedly being protected by the project, should be abandoned and/or condemned. No further taxpayer expenses should occur to protect this area. Access to the City and County property allegedly cutoff from the erosion can be made via State property (Waianae High School).

3. Alternative number 2.1.1 (No Action Alternative) should be the preferred alternative.

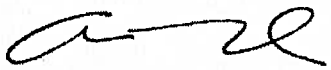
4. Alternative number 2.1.3 (Enclose and Fill Cove) is a reasonable alternative that should be further considered. This is basically a completion and/or correction of the botched 2003 job and is a reasonable action for the City and County to partake. The likelihood of this alternative working is very high and the benefits greatly outweigh the minimal environmental damage to marine life in the small cove. A modification to this alternative should also be considered that entails not filling in the cove and allowing seepage and/or small channels of ocean water to enter the cove to function similarly to an ancient fishpond.

5. Alternatives number 2.1.2 and 2.1.4 are not acceptable alternatives because they will not survive/endure heavy surf.

6. Any work necessary to construct alternatives number 2.1.2 or 2.1.4 or filling in of the cove under alternative 2.1.3 should require a special management area permit.

7. No iwi should be disturbed under any of the alternatives chosen and an onsite cultural monitor and/or lineal descendant should be present whenever work is conducted on or near the shoreline and inland.

Sincerely,



Allen Frenzel

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January 30, 2014

Mr. Allen Frenzel
84-933 Alahele St.
Wai`anae, HI 96792

Subject: Comments on the Draft Environmental Assessment (DEA) for Rock Revetment at Mauna Lahilahi Beach Park, Wai`anae, O`ahu, Hawai`i, TMK (1) 8-5-017:005

Dear Mr. Frenzel:

On behalf of the City and County of Honolulu Department of Design and Construction (DDC), thank you for your comments on the subject DEA. Your comment letter is attached. A listing of your comments in italics and our response to each follows.

Comment:

1. *The project appears to be for the protection of private property and/or mitigation efforts to correct a batched job that should not have been performed in 2003. Any liability issues the City and County now has regarding the botched 2003 job should be resolved in Court as appropriate and no further mitigation failure (due to environmentalist pressure) to place the breakwater out further from the cove as originally intended and planned is a lost opportunity and should not be a reason to waste more tax dollars on inferior alternatives to the original plan.*

Response:

The existing breakwater could not be placed farther seaward because the substrate outside the breakwater is home to coral. Federal regulations exist to protect live coral and several Federal agencies, including the National Marine Fisheries Service and the Fish and Wildlife Service, used their authority to keep the breakwater in an area with little coral growth. The breakwater has retained a nourished beach for more than 10 years, which is what it was designed to do. The breakwater has also stopped waves from eroding the south corner of the cove and from running inland past park property. Environmental effects must be considered in every coastal protection project. That is why an environmental assessment is prepared.

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177

Comment:

2. *The City and County property, which is allegedly being protected by the project, should be abandoned and/or condemned. No further taxpayer expenses should occur to protect this area. Access to the City and County property allegedly cutoff from the erosion can be made via State property (Waianae High School).*

Response:

Disposition of the protected property would have to be determined by the City Council and the Mayor's office. The revetment project was funded through the City Councilman's office for Wai`anae. This DEA is not part of the funding process.

Comment:

3. *Alternative number 2.1.1 (No Action Alternative) should be the preferred alternative.*

The City and County decided against the No Action Alternative, because the erosion issues will not be solved and eventually more expensive emergency actions will probably be necessary.

Comment:

4. *Alternative number 2.1.3 (Enclose and Fill the Cove) is a reasonable alternative that should be further considered. This is basically a completion and/or correction of the botched 2003 job and is a reasonable action for the City and County to partake. The likelihood of this alternative working is very high and the modification to this alternative should also be considered that entails not filling in the cove and allowing seepage and/or small channels of ocean water to enter the cove to function similarly to an ancient fishpond.*

Response:

The alternative to enclose and fill the cove means that the entire cove from the shoreline to the mouth would be filled with rock and sand. This option would destroy all marine life in the cove and probably not be acceptable to anyone. The option of extending the breakwater to the opposite side of the cove to make something like a fishpond has not been offered or considered previously. This option would require a new design and environmental review process that would be very expensive before its feasibility could be determined.

Comment:

5. *Alternatives number 2.1.2 and 2.1.4 are not acceptable alternatives because they will not survive/endure heavy surf.*

Response:

Both of these alternatives are designed to survive heavy surf. An inner breakwater would be built like the existing breakwater that has survived for over 10 years without major damage. However, the City and County has decided not to build an inner breakwater. The proposed rock revetment is designed to survive heavy surf and is also protected for most of its length by the existing breakwater.

Comment:

6. *Any work necessary to construct alternatives number 2.1.2 or 2.1.4 or filling in of the cove under alternative 2.1.3 should require a special management area permit.*

Response:

A Special Management Area use permit is required by the City and County only for work mauka from the certified shoreline. The inner breakwater will not be constructed. The proposed rock revetment will be constructed seaward of the certified shoreline, and should not require an SMA permit. We have responded to the City and County Department of Planning and Permitting on the location of the revetment relative to the certified shoreline.

Comment:

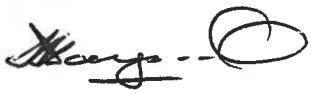
7. *No iwi should be disturbed under any of the alternatives chosen and an onsite cultural monitor and/or lineal descendent should be present whenever work is conducted on or near the shoreline and inland.*

Response:

The selected contractor will be responsible for hiring a cultural monitor during construction. The location of *`iwi* has been coordinated with the family who used to live in this area. Known burial sites have been located relative to the work site. An archaeologist was hired to assist in community coordination and other matters regarding the *`iwi.* The State Historic Preservation Division has been involved with this site and other nearby cultural/burial sites. Archaeologists have made many studies in the beach park area.

Please contact me at 531-3017 or Mr. Terry Hildebrand of the DDC Facilities Division at 768-8401 if you want further information.

Sincerely,



Dayananda Vithanage, P.E., Ph.D.
Director of Engineering
Oceanit

att

517582

OFFICE OF PLANNING
STATE OF HAWAII

NEIL ABERCROMBIE
GOVERNOR

JESSE K. SOUKI
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: http://hawaii.gov/dbedt/op/

Ref. No. P-14006

May 31, 2013

Mr. Chris T. Takashige, P.E., CCM, Director
Department of Design and Construction
City and County of Honolulu
650 S. King Street, 11th Floor
Honolulu, Hawaii 96813

Dear Mr. Takashige:

Subject: Draft Environmental Assessment for Proposed Rock Revetment at Mauna Lahilahi Beach Park, Waianae, Oahu, Tax Map Key: (1) 8-5-54: 017 (portions of parcels 4, 6, and 7)

Thank you for the opportunity to provide comments on the Draft Environmental Assessment (Draft EA) for the Mauna Lahilahi Beach Park Rock Revetment.

The Office of Planning has reviewed the subject Draft EA, and acknowledges that the document provides a satisfactory discussion of the Coastal Zone Management objectives and policies found in Hawaii Revised Statutes (HRS) §205A-2, addressing the areas of Recreational Resources, Historic Resources, Coastal Hazards, and Beach Protection.

Page 3-15 of the Draft EA provides as follows:

> "Design water elevation for the revetment was determined to be 6.2 feet MSL. This water level was calculated by adding the highest anticipated tide (1.9 feet MSL), potential wave setup (4.8 feet), and estimated sea level rise over the 50 year design life of the structure (0.3 feet) to find the water depth (5 feet)."

The Final EA should cite the reference(s) regarding the sea level rise over the 50 year design life of the structure (0.3 feet), whether the sea level rise estimate is site specific or for the Island of Oahu, and confirm that adding the amounts noted for highest anticipated tide, potential wave setup, and water depth totals 6.2 feet MSL.

The Draft EA correctly identifies on Chapter 8, pg. 8-1, the need for CZM Federal Consistency Review which is required in conjunction with the Department of the Army Permit.

Page 8-1 of the Draft EA indicates that the need for a Special Management Area (SMA) Use Permit or a shoreline setback variance has not been determined. These determinations should be obtained and reflected in the Final EA. Please note that the planning department of the various counties is charged with assessing the requirements for SMA use and shoreline setback variance. The Department of Planning and Permitting, City and County of Honolulu, should be consulted as to the potential SMA permit and shoreline setback variance requirements regarding the proposed action. Pursuant to HRS §205A-28, no development as defined in HRS §205A-22, shall be allowed in any county within the SMA without obtaining an SMA permit.

Finally, please refer to the Hawaii Watershed Guidance document (August 2010) regarding information on Nonpoint Source Pollution safeguards. This file can be downloaded from the Office of Planning website: http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf. Please see the section on Hydromodifications, specifically Part B – Management Measures for Streambank and Shoreline Erosion (pgs. 160-161), when developing the site specific best management plan. This document offers guidance and suggested practices related to shoreline erosion.

If you have any questions regarding this comment letter, please contact Leo Asuncion, Coastal Zone Management Program Manager, at 587-2875.

Sincerely,

Jesse K. Souki
Director

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innovation through engineering & scientific excellence

October 21, 2013

Mr. Jesse K. Souki, Director
Office of Planning
State of Hawaii
P.O. Box 2359
Honolulu, HI 96804

Subject: Draft Environmental Assessment
Mauna Lahilahi Beach Park Rock Revetment

Dear Mr. Souki:

On behalf of our client, the City and County of Honolulu (CCH) Department of Design and Construction (DDC), thank you for reviewing and commenting on the Draft Environmental Assessment. A listing of your comments and our response to each follows:

Comment:

Page 3-15 of the Draft EA provides as follows:

> *"Design water elevation for the revetment was determined to be 6.2 feet MSL This water level was calculated by adding the highest anticipated tide (1.9 feet MSL), potential wave setup (4.8 feet), and estimated sea level rise over the 50 year design life of the structure (0.3 feet) to find the water depth (5 feet)."*

The Final EA should cite the reference(s) regarding the sea level rise over the 50 year design life of the structure (0.3 feet), whether the sea level rise estimate is site specific or for the Island of Oahu, and confirm that adding the amounts noted for highest anticipated tide, potential wave setup, and water depth totals 6.2 feet MSL.

Response:

This paragraph will be corrected as follows:

> Design water elevation for the revetment was determined to be 6.2 feet MSL (rounded). This water level was calculated by adding high tide (1.08 feet MSL), potential wave setup (4.85 feet), and the estimated sea level rise over the 50-year design life of the structure (0.245 feet).

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177

The sea level rise was taken from an NOAA graph of monthly mean sea level rise at Honolulu Harbor between 1905 and 2006. The annual rate over this time period was 1.5 +/- 0.25 mm/yr (0.0049 +/- 0.0082 ft/yr). This calculation does not include regular seasonal fluctuations. The web site for the NOAA Honolulu data is: http://tidesandcurrents.noaa.gov/sltrends/residual1980.shtml?stnid=1612340

Similar data can be found in Technical Report NOS CO-OPS 053, Sea Level Variations of the United States 1854-2006, published by NOAA.

Comment:

The Draft EA correctly identifies on Chapter 8, pg 8-1, the need for CZM Federal Consistency Review which is required in conjunction with the Department of the Army Permit.

Response:

A CZM Federal Consistency Review application has been sent to the CZM office, and a request for additional information has been received from Mr. John Nakagawa. We are in the process of providing the information when it is ready.

Comment:

Page 8-1 of the Draft EA indicates that the need for a Special Management Area (SMA) Use Permit or a shoreline setback variance has not been determined. These determinations should be obtained and reflected in the Final EA. Please note that the planning department of the various counties is charged with assessing the requirements for SMA use and shoreline setback variance. The Department of Planning and Permitting, City and County of Honolulu, should be consulted as to the potential SMA permit and shoreline setback variance requirements regarding the proposed action. Pursuant to HRS 205A-28, no development as defined in HRS 205A-22, shall be allowed in any county within the SMA and without obtaining and SMA permit.

Response:

We have received comments from the Department of Planning and Permitting on the requirement for an SMA permit and a setback variance. We are providing DPP with a clearly marked certified shoreline map and a discussion on the location of the project. None of the proposed work is on the mauka side of the certified shoreline in the SMA or shoreline setback area.

Comment:

Finally, please refer to the Hawaii Watershed Guidance document (August 2010) regarding information on Nonpoint Source Pollution safeguards. This file can be downloaded from the Office of Planning website: http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Fninal.pdf. Please see the section on Hydromodifications, specifically Part B – Management Measures for Streambank and Shoreline Erosion (pgs. 160-161), when developing the site specific best management plan. This document offers guidance and suggested practices related to shoreline erosion.

Response:

The site specific best management plan for the project is meant for use during construction of the revetment only, not for long-term erosion control. After years of experience with erosion control at the project site, the proposed rock revetment was selected by the City and County as the best, most cost effective method of erosion control. Coastal vegetation (naupaka) grows along the top of the bank at the mauka property line. However, the vegetated area is not large enough to mitigate wave runup and overtopping. The strip park land at the top of the bank is too narrow to grow more naupaka. We do not believe that any vegetative stabilization method is appropriate for this location.

Please contact me or Dr. Warren Bucher of Oceanit at 531-3017 if you need further information.

Sincerely,

Dayananda Vithanage, P.E., Ph.D.
Director of Engineering
Oceanit

att

cc: CCH/DDC

519953

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 • Fax (808) 973-2941

JUN 24 2013

2013 JUN 25 AM 10:37

RECEIVED
DEPT OF DESIGN & CONSTR
C & C OF HONOLULU

Mr. Clifford Lau
City and County of Honolulu
Department of Design and Construction
Facilities Division, Planning Branch
650 S. King St., 11th Floor
Honolulu, HI 96813

Dear Mr. Lau:

This letter provides comments on the Draft Environmental Assessment (DEA) for the proposed Mauna Lahilahi Beach Park Rock Revetment project in Waianae, O'ahu. The National Marine Fisheries Service (NMFS) Pacific Islands Region's Protected Resources Division provides the following comments about how the development may affect protected marine species under its jurisdiction.

The DEA relies on a Marine Biological Survey that was completed in 2001. This survey is outdated and does not take into account the increased presence of protected marine species in the area over the past 12 years. Our agency recommends that a new survey be completed in order to provide accurate information on the potential for this project to impact marine species.

The Hawaiian monk seal (*Monachus schauinslandi*) is listed as endangered under the Endangered Species Act (ESA) and may potentially be affected by the project. These animals are sensitive to human disturbance and could be negatively affected by construction noise and human presence in the area.

Green sea turtles (*Chelonia mydas*) are listed as threatened under the ESA and are present in the near shore waters of the project area. These animals also may be negatively affected by the planned construction activities. We recommend that Best Management Practices and mitigation measures to minimize disturbance to and human interactions with green sea turtles and Hawaiian monk seals be discussed in detail in the EA.

Measures should also be taken to prevent run-off from grading, excavation, or other construction activities, particularly in the event of bad weather during construction. Run-off can alter or destroy offshore sea turtle foraging habitat, and may also have negative impacts on corals by smothering them with silt or increasing algae blooms.

If you should have any questions regarding these comments, please contact Jayne LeFors on my staff at (858) 546-5653 or at the e-mail address jayne.lefors@noaa.gov.

Sincerely,

Lisa Van Atta
Assistant Regional Administrator
for Protected Resources

cc: Oceanit Laboratories, Inc.

Best Management Practices (BMPs) for General In- and Near-Water Work Including Boat and Diver Operations

April 2013

NMFS Protected Resources Division recommends implementation of the following BMPs to reduce potential adverse affects on protected marine species. These BMPs are in no way intended to supersede or replace measures required by any other agency including, but not limited to the ACOE, USFWS, USEPA, or NMFS Habitat Conservation Division, and compliance with these BMPs shall always be considered secondary to safety concerns.

All workers associated with this project, irrespective of their employment arrangement or affiliation (e.g. employee, contractor, etc.) shall be fully briefed on these BMPs and the requirement to adhere to them for the duration of their involvement in this project.

A. Constant vigilance shall be kept for the presence of ESA-listed marine species during all aspects of the proposed action, particularly in-water activities such as boat operations, diving, and deployment of anchors and mooring lines.

1. The project manager shall designate an appropriate number of competent observers to survey the areas adjacent to the proposed action for ESA-listed marine species.
2. Surveys shall be made prior to the start of work each day, and prior to resumption of work following any break of more than one half hour. Periodic additional surveys throughout the work day are strongly recommended.
3. All work shall be postponed or halted when ESA-listed marine species are within 50 yards of the proposed work, and shall only begin/resume after the animals have voluntarily departed the area. If ESA-listed marine species are noticed within 50 yards after work has already begun, that work may continue only if, in the best judgment of the project supervisor, that there is no way for the activity to adversely affect the animal(s). For example; divers performing surveys or underwater work would likely be permissible, whereas operation of heavy equipment is likely not.
4. Special attention will be given to verify that no ESA-listed marine animals are in the area where equipment or material is expected to contact the substrate before that equipment/material may enter the water.
5. All objects will be lowered to the bottom (or installed) in a controlled manner. This can include the use of buoyancy controls such as lift bags, or the use of cranes, winches, or other equipment that affect positive control over the rate of descent.
6. In-water tethers, as well as mooring lines for vessels and marker buoys shall be kept to the minimum lengths necessary, and shall remain deployed only as long as needed to properly accomplish the required task.

7. When piloting vessels, vessel operators shall alter course to remain at least 100 yards from whales, and at least 50 yards from other marine mammals and sea turtles.
8. Reduce vessel speed to 10 knots or less when piloting vessels at or within the ranges described above from marine mammals and sea turtles. Operators shall be particularly vigilant to watch for turtles at or near the surface in areas of known or suspected turtle activity, and if practicable, reduce vessel speed to 5 knots or less.
9. If despite efforts to maintain the distances and speeds described above, a marine mammal or turtle approaches the vessel, put the engine in neutral until the animal is at least 50 feet away, and then slowly move away to the prescribed distance.
10. Marine mammals and sea turtles shall not be encircled or trapped between multiple vessels or between vessels and the shore.
11. Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

B. No contamination of the marine environment shall result from project-related activities.

12. A contingency plan to control toxic materials is required.
13. Appropriate materials to contain and clean potential spills shall be stored at the work site, and be readily available.
14. All project-related materials and equipment placed in the water shall be free of pollutants.
15. The project manager and heavy equipment operators shall perform daily pre-work equipment inspections for cleanliness and leaks. All heavy equipment operations shall be postponed or halted should a leak be detected, and shall not proceed until the leak is repaired and equipment cleaned.
16. Fueling of land-based vehicles and equipment shall take place at least 50 feet away from the water, preferably over an impervious surface. Fueling of vessels shall be done at approved fueling facilities.
17. Turbidity and siltation from project-related work shall be minimized and contained through the appropriate use of erosion control practices, effective silt containment devices, and the curtailment of work during adverse weather and tidal/flow conditions.
18. A plan shall be developed to prevent debris and other wastes from entering or remaining in the marine environment during the project.

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October 22, 2013

Ms. Lisa Van Atta
Assistant Regional Administrator for Protected Resources
U.S. Department of Commerce, NOAA
National Marine Fisheries Service
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, HI 96814-4700

Subject: Draft Environmental Assessment
Mauna Lahilahi Beach Park Rock Revetment

Dear Ms. Van Atta:

On behalf of the Department of Design and Construction, thank you for reviewing and commenting on the Draft Environmental Assessment. Your comment letter is attached. A listing of your comments in italics and our response to each follows:

Comment:

The DEA relies on a Marine Biological Survey that was completed in 2001. This survey is outdated and does not take into account the increased presence of protected marine species in the area over the past 12 years. Our agency recommends that a new survey be completed in order to provide accurate information on the potential for this project to impact marine species.

DDC Response:

After construction, the existing breakwater and nourished beach were monitored quarterly or semi-annually for 5 years between 2003 and 2008. The monitoring included coral and other marine species as well as the configuration of the nourished beach and the breakwater. Copies of the 14 monitoring reports were sent to Mr. John Naughton of the National Marine Fisheries Service. These reports were not included in the DEA. Because of the previous monitoring program, there is currently no plan to perform further biological surveys. Best management practices will be used to warn contractors of any endangered species in the revetment work area, and work will be stopped if required.

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177

Comment:

The Hawaiian monk seal (Monachus schouinslandi) is listed as endangered under the Endangered Species Act (ESA) and may potentially be affected by the project. These animals are sensitive to human disturbance and could be negatively affected by construction noise and human presence in the area.

DDC Response:

A Site Specific Best Management Practices Plan has been written for the revetment project. The "NOAA Best Management Practices" including "Mitigation Measures to Reduce Impacts to Protected Species" are included in the Site Specific BMP. The Site Specific BMP is being provided to various agencies and will be included in the bid package for potential contractors. The selected contractor will be required to follow the BMP.

Comment:

Green sea turtles (Chelonia mydas) are listed as threatened under the ESA and are present in the near shore waters of the project area. These animals also may be negatively affected by the planned construction activities. We recommend that Best Management Practices and mitigation measures to minimize disturbance to and human interactions with green sea turtles and Hawaiian monk seals be discussed in detail in the EA.

DDC Response:

A Site Specific Best Management Practices Plan has been written for the revetment project. The "NOAA Best Management Practices" including "Mitigation Measures to Reduce Impacts to Protected Species" are included in the Site Specific BMP and will be included in the FEA. The Site Specific BMP is being provided to various agencies and will be included in the bid package for potential contractors. The selected contractor will be required to follow the BMP.

Comment:

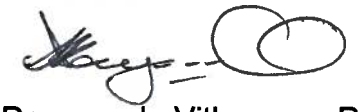
Measures should also be taken to prevent run-off from grading, excavation, or other construction activities, particularly in the event of bad weather during construction. Run-off can alter or destroy offshore sea turtle foraging habitat, and may also have negative impacts on corals by smothering them with silt or increasing algae blooms.

DDC Response:

The project plans and the Site Specific BMP contain a drawing that shows a temporary sandbag structure that will move along with the revetment construction to minimize and contain runoff pollution. This sandbag structure will be inside the existing rock breakwater, which also provides protection from wave runup and associated erosion. There is very little coral growth or turtle forage inside the breakwater. The bottom is primarily sand and rubble.

Please contact me or Dr. Warren Bucher of Oceanit at 531-3017 if you need further information.

Sincerely,



Dayananda Vithanage, P.E., Ph.D.
Director Engineering
Oceanit

att

cc: CCH/DDC

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 20, 2013

City and County of Honolulu
Department of Design and Construction
Attention: Mr. Chris T. Takashige
650 S King Street, 11th Floor
Honolulu, Hawaii 96813

via email: ctakashige@honolulu.gov

Dear Mr. Takashige,

SUBJECT: Draft Environmental Assessment, Mauna Lahilahi Beach Park Rock Revetment, Wai`anae, Oahu

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (1) Land Division – Oahu District; and (2) Division of Boating and Ocean Recreation. No other comments were received as of our suspense date. Should you have any questions, please feel free to call Supervising Land Agent Steve Molmen at 587-0439. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure(s)
c: OEQC
Clifford Lau, Facilities Division
Dayanada Vithanage, Oceanit Laboratories

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 9, 2013

MEMORANDUM

TO: **DLNR Agencies:**
_X_ Div. of Aquatic Resources
_X_ Div. of Boating & Ocean Recreation
_X_ Engineering Division
___ Div. of Forestry & Wildlife
___ Div. of State Parks
___ Commission on Water Resource Management
_X_ Office of Conservation & Coastal Lands
_X_ Land Division – Oahu District
_X_ Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Draft Environmental Assessment, Mauna Lahilahi Beach Park Rock Revetment, Wai`anae, O`ahu

LOCATION: Island of O`ahu, Wai`anae District, Tax Map Key Numbers: 8-5-017:005 (and portions of 4, 6, and 7)

APPLICANT: City and County of Honolulu, Department of Design and Construction, by its consultant, Oceanit Laboratories, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document, which can be located here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "DEA, Mauna Lahilahi Beach Park Rock Revetment", then click on "Files" and "Download a copy".

Please submit any comments by June 19, 2013. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

(✓) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: _____
Print Name: _____
Date: May 14, 2013

c: Central Files

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

May 9, 2013

RECEIVED
LAND DIVISION
2013 MAY 14 PM 3:03
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

From:

MEMORANDUM

TO:

DLNR Agencies:
X Div. of Aquatic Resources
X Div. of Boating & Ocean Recreation
X Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
__Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Oahu District
X Historic Preservation

To:

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Draft Environmental Assessment, Mauna Lahilahi Beach Park Rock Revetment, Wai`anae, O`ahu

LOCATION: Island of O`ahu, Wai`anae District, Tax Map Key Numbers: 8-5-017:005 (and portions of 4, 6, and 7)

APPLICANT: City and County of Honolulu, Department of Design and Construction, by its consultant, Oceanit Laboratories, Inc.

Transmitted for your review and comment on the above-referenced document. We would appreciate your comments on this document, which can be located here:

1. Go to: https://sp01.ld.dlnr.hawaii.gov/LD
2. Login: Username: LD\Visitor Password: 0pa$$word0 (first and last characters are zeros)
3. Click on: Requests for Comments
4. Click on the subject file "DEA, Mauna Lahilahi Beach Park Rock Revetment", then click on "Files" and "Download a copy".

Please submit any comments by June 19, 2013. If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Supervising Land Agent Steve Molmen at (808) 587-0439. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: Edward R. Underwood
Print Name: Edward R. Underwood
Date: 5/13/13

c: Central Files

MAY 10 1:24PM 1:24PM DLNR

oceanit
innovation through engineering & scientific excellence

January 30, 2014

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

Subject: Comments on The Draft Environmental Assessment (EA) for Rock Revetment at Mauna Lahilahi Beach Park, Wai`anae, O`ahu, Hawaii, TMK (1) 8-5-017:005

Dear Mr. Tsuji:

On behalf of the City and County of Honolulu Department of Design and Construction, thank you for the responses from the Land Division and the Division of Boating and Ocean Recreation on the subject Draft EA. Your comment letter is attached.

Please contact me or Dr. Warren Bucher at 531-3017 if you need additional information.

Sincerely,

Dayananda Vithanage, P.E., Ph.D.
Director of Engineering
Oceanit

att

022438

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

KIRK CALDWELL
MAYOR

GEORGE I. ATTA, FAICP
DIRECTOR

ARTHUR D. CHALLACOMBE
DEPUTY DIRECTOR

2013/ELOG-943 (MS)

July 11, 2013

MEMORANDUM

TO: Chris T. Takashige, Director
Department of Design and Construction

FROM: GIA for George I. Atta, FAICP, Director
Department of Planning and Permitting

SUBJECT: Draft Environmental Assessment (EA)
Mauna Lahilahi Beach Park Rock Revetment
Tax Map Key 8-5-17: 5

We have reviewed the Draft Environmental Assessment (EA), received on May 8, 2013, for the above project, and have the following comments:

A. Site Development Division:

Page 1-2 and Section 8 should include grading permit to the list of permits and approvals required.

B. Planning Division:

The EA should address the policy in Section 3.3.2.3 in the Waianae Sustainable Communities Plan that shore armoring along beaches of the Waianae District should generally be discouraged.

C. Land Use Permitting Division:

1. Figure 3-1b is difficult to read. If it is intended to show the topographic conditions that existed in 1972, a more legible plan should be provided.

2. Include the dimensions of the revetment on Figure 3-12 Revetment Plan.

3. Include a list of agencies that received copies of the Draft EA for review and comments.

4. The site appears to be located within the Special Management Area (SMA) as defined by Chapter 25, Revised Ordinance of Honolulu (ROH), and development on

the site may require either a Minor or Major SMA Use Permit, depending on the project valuation and impact on the coastal/wetland resources. The Final EA should address compliance with the objectives and guidelines of Chapter 25, ROH, related to the SMA.

5. Work and structures that are located within the 40-foot shoreline setback area are subject to the requirements of Chapter 23, ROH. A Shoreline Setback Variance will be required for these activities. The Final EA should address compliance with the objectives and policies of Chapter 23, ROH and DPP Administrative Rules, Part 2, related to shoreline setback variances.

6. The Final EA should include a copy of the certified shoreline survey.

7. The Final EA should provide a more in depth analysis of maintaining or construction of the sandbag revetment as an alternative to the propose shoreline hardening that the rock revetment would create.

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

GIA:nw

oceanit
innovation through engineering & scientific excellence

October 29, 2013

George I. Atta, FAICP, Director
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, HI 96813

Dear Mr. Atta:

Subject: Comments on Draft Environmental Assessment
Mauna Lahilahi Beach Park Rock Revetment

On behalf of the Department of Design and Construction (DDC), City and County of Honolulu (CCH), thank you for reviewing and commenting on the Draft Environmental Assessment. Your comment letter is attached. A listing of your comments in italics and our response to each follows:

A. *Site Development Division:*

Page 1-2 and Section 8 should include grading permit to the list of permits and approvals required.

Response:

All site work will be done makai of the certified shoreline; therefore, we do not believe any DPP permits will be required. A drawing showing more clearly the location of the certified shoreline is attached for your review.

B. *Planning Division:*

The EA should address the policy in Section 3.3.2.3 in the Waianae Sustainable Communities Plan that shore armoring along beaches of the Waianae District should generally be discouraged.

Response:

Beach loss and erosion damage to the shoreline at the revetment location have continued for over 60 years. A rock breakwater and beach nourishment were placed in 2003. However, waves entering the protected cove pass the breakwater tip and occasionally overtop the shoreline embankment and erode the backshore area. These waves also moved the nourished sand to the south end of the cove so that there is no beach along much of the cove's shoreline. Several alternatives for additional shore

protection were considered including more beach nourishment, an additional breakwater, and a rock revetment. Beach nourishment is expensive and sand supplies on Oahu are very limited. The Department of Parks and Recreation determined that protection of the narrow strip of land along the park's mauka property line had highest priority, so they selected a rock revetment, which would directly protect the eroding embankment, rather than selecting an additional breakwater that would be harder to construct and would cover bottom substrate near the existing breakwater. The revetment also provides wider lateral access along the shoreline. If the shoreline erodes a few feet further, there will be no safe lateral access.

C. *Land Use Permitting Division:*

1. *Figure 3-1b is difficult to read. If it is intended to show the topographic conditions that existed in 1972, a more legible plan should be provided.*

Response:

Figure 3-1b has been edited to more clearly show the topography and beach slope in1972. The edited version will be used in the Final Environmental Assessment (FEA).

2. *Include the dimensions of the revetment on Figure 3-12 Revetment Plan.*

Response:

Figure 3-12 has a graphic scale because it is too busy to show dimensions clearly. The revetment armor stone layer is approximately 300 feet long and 40 feet wide.

3. *Include a list of agencies that received copies of the Draft EA for review and comments.*

Response:

A list of agencies and political representatives is attached and will be included in the FEA.

4. *The Site appears to be located within the Special Management Area (SMA) as defined by Chapter 25, Revised Ordinance of Honolulu (ROH), development on the site may require either a Minor or Major SMA Use Permit, depending on the project valuation and impact on the coastal/wetland resources. The Final EA should address compliance with the objectives and guidelines of Chapter 25, ROH, related to the SMA.*

Response:

The attached drawing C-4, Erosion Control Plan, shows the certified shoreline in red and the limits of grading and disturbance. Also attached is an 11X17 copy of the certified shoreline map. All of the work proposed for the project is seaward of the certified shoreline and does not fall within the SMA.

5. *Work and structures that are located within the 40-foot shoreline setback area are subject to the requirements of Chapter 23, ROH. A Shoreline Setback Variance will be required for these activities. The Final EA should address compliance with the objectives and policies of Chapter 23, ROH and DPP Administrative Rules, Part 2, related to shoreline setback variances.*

Response:

As shown on attached drawing C-4, all of the work proposed for the project is seaward of the certified shoreline and does not fall within the shoreline setback.

6. *The Final EA should include a copy of the certified shoreline survey.*

Response:

The certified shoreline survey will be included in the Final EA.

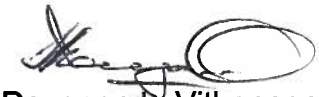
7. *The Final EA should provide a more in-depth analysis of maintaining or construction of the sandbag revetment as an alternative to the proposed shoreline hardening that the rock revetment would create.*

Response:

The existing sandbag revetment has required maintenance and reconstruction many times since it was installed. Sandbag revetments are intended for temporary use. Because of unforeseen problems in the permanent shore protection, the sandbag revetment was not removed until a better solution could be planned and installed. The sandbag revetment is a hardened structure. A rock revetment should cost less to maintain over the long term.

Please contact me at 531-3017 or Mr. Terry Hildebrand of the DDC Facilities Division at 768-8401 if you need further information.

Sincerely,



Dayananda Vithanage, P.E., PhD
Director of Engineering
Oceanit

att

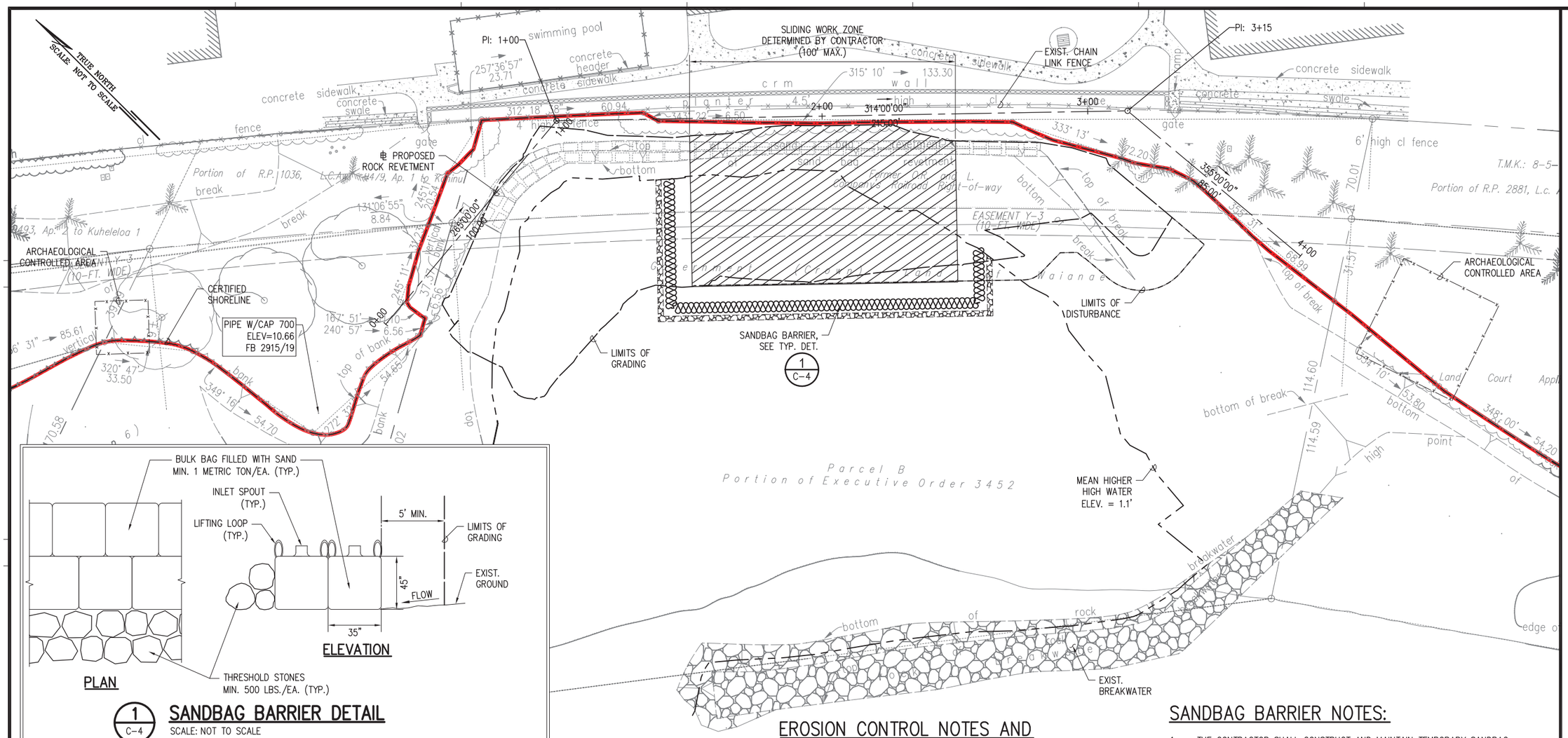
Attachment 1

LIST OF AGENCIES THAT RECEIVED COPIES OF THE MAUNA LAHILAHI ROCK REVETMENT DRAFT EA FOR REVIEW AND COMMENT

U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
Land Division, Department of Land and Natural Resources
Clean Water Branch, Department of Health
Coastal Zone Management Program, State Office of Planning
Department of Planning and Permitting, City and County of Honolulu,
State Historic Preservation Division, Department of Land and Natural Resources
Department of Hawaiian Home Lands
Office of Hawaiian Affairs
Water Resources Research Center, University of Hawaii
U.S. Army Corps of Engineers
National Marine Fisheries Service, NOAA
U.S. EPA, Region 9, Pacific Islands Contact Office
Department of Parks and Recreation, City and County of Honolulu
Waianae Coast Neighborhood Board Number 24
Ms. Kymberly Marcos Pine, District 1 – Councilmember
Makaha Surfside AOAO
Department of Land and Natural Resources, Office of Conservation and Coastal Lands
Senator Maile Shimabukuro
Oahu Burial Council
Representative Jo Jordan, House District 44

Attachment 2

EROSION CONTROL PLAN DRAWING C-4 WITH CERTIFIED SHORELINE IN RED



1 / C-4 **SANDBAG BARRIER DETAIL**
SCALE: NOT TO SCALE

TYPICAL SLIDING WORK AREA EROSION CONTROL PLAN

SCALE: NOT TO SCALE

LEGEND:

- ⊕ PROPOSED ROCK REVETMENT
- CERTIFIED SHORELINE
- LIMITS OF DISTURBANCE
- LIMITS OF GRADING
- ~ MEAN HIGHER HIGH WATER
- SANDBAG BARRIER (TEMPORARY)
- SLIDING WORK ZONE

MAINTENANCE:

1. SANDBAG BARRIER SHALL BE INSPECTED IMMEDIATELY AFTER SIGNIFICANT WAVE EVENTS WHERE RUNUP OVERTOPS THE SANDBAGS. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
2. SHOULD THE FABRIC ON A BULK BAG DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE BARRIER STILL BE NECESSARY, THE SANDBAGS SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT. SEDIMENT SHALL BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-THIRD THE HEIGHT OF THE BARRIER.
4. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SANDBAG BARRIER IS NO LONGER REQUIRED SHALL BE REMOVED BY THE CONTRACTOR.

EROSION CONTROL NOTES AND BEST MANAGEMENT PRACTICES (BMPS):

1. REVETMENT CONSTRUCTION ACTIVITIES BELOW THE MEAN HIGHER HIGH WATER ELEVATION SHALL BE CONDUCTED ONLY DURING PERIODS OF LOW TIDE.
2. THE CONTRACTOR SHALL PREPARE AND SUBMIT TEMPORARY EROSION AND SEDIMENT CONTROL PROCEDURES TO THE OFFICER-IN-CHARGE FOR APPROVAL PRIOR TO COMMENCEMENT OF GRADING.
3. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
4. CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF CLEARED SURFACE AREA. SANDBAG BARRIER PROTECTION SHALL COMPLY WITH CONSTRUCTION SEQUENCING.
5. INSPECT SANDBAG BARRIER DAILY AND REPAIR AS NECESSARY.
6. TEMPORARY SOIL STABILIZATION WITH APPROPRIATE VEGETATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY (30) CALENDAR DAYS.
7. PERMANENT SOIL STABILIZATION WITH PERENNIAL VEGETATION SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING.
8. STORM WATER FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED BY USING APPROPRIATE CONTROL MEASURES AS PRACTICAL.
9. REMOVE ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS WITHIN 24 HOURS.

SANDBAG BARRIER NOTES:

1. THE CONTRACTOR SHALL CONSTRUCT AND MAINTAIN TEMPORARY SANDBAG BARRIER AS INDICATED. SEE DETAIL 1 / C-4 . SANDBAG BARRIER ALIGNMENT SHOWN IS APPROXIMATE. CONTRACTOR SHALL ADJUST ACTUAL LOCATIONS TO ACCOMMODATE HIS/HER CONSTRUCTION METHODS OR STAGING AND RETAIN SILT ON-SITE.
2. SANDBAG BARRIER SHALL CONSIST OF TWO ROWS OF SANDBAGS WITH LARGE STONES PLACED ALONG THE SEAWARD EDGE. THE HEIGHT OF THE BARRIER SHALL NOT EXCEED 48 INCHES.
3. EACH SAND BAG SHALL BE WOVEN POLYPROPYLENE BULK BAGS MEASURING 35" X 35" X 45" FILLED WITH A MINIMUM ONE METRIC TON OF APPROVED COMPATIBLE BEACH SAND (< 6% FINES). THE BAGS MAY BE FILLED AT THE SAND SOURCE IF APPROVED BY THE OFFICER-IN-CHARGE AND LAND OWNER.
4. STONES SHALL BE PLACED ALONG THE OUTSIDE OF THE BULK BAGS TO FORM A THRESHOLD TO HELP TO MITIGATE WAVE REFLECTION. STONES SHALL BE 1½' TO 2' EQUIVALENT DIAMETER OF WEIGHT 500 LBS (MIN.). THE CONTRACTOR MAY USE STONES FROM THE PROJECT SITE IF APPROVED BY THE CONTRACTING OFFICER.
5. SANDBAG BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UP-SLOPE AREA HAS BEEN PERMANENTLY STABILIZED. DURING REMOVAL, BULK BAGS SHALL BE CUT OPEN AND COMPATIBLE FILLER SAND SHALL BE DEPOSITED IN PLACE.
6. BMP PROVIDED HEREIN ARE MINIMUM REQUIREMENTS, DURING BIDDING AND CONSTRUCTION, THE CONTRACTOR SHALL RETAIN A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL (CPESC) TO ESTABLISH THE BMPS NECESSARY TO MEET FEDERAL AND LOCAL LAWS AND REGULATIONS REGARDING WATER QUALITY AND WATER POLLUTION CONTROL.

GRAPHIC SCALE: NOT TO SCALE

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED

THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

4/30/14
EXPIRATION DATE OF LICENSE

WARREN E. BUCHER
LICENSED PROFESSIONAL ENGINEER
No. 10606-C
HAWAII, USA

SIGNATURE

DESIGN	REVIEW	DRAWN
BY: AK	WB	AK

DATE: NOVEMBER 2012
ACCEPTED:

CHIEF, MECHANICAL/ELECTRICAL DIVISION
CHIEF, FACILITIES DIVISION

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU

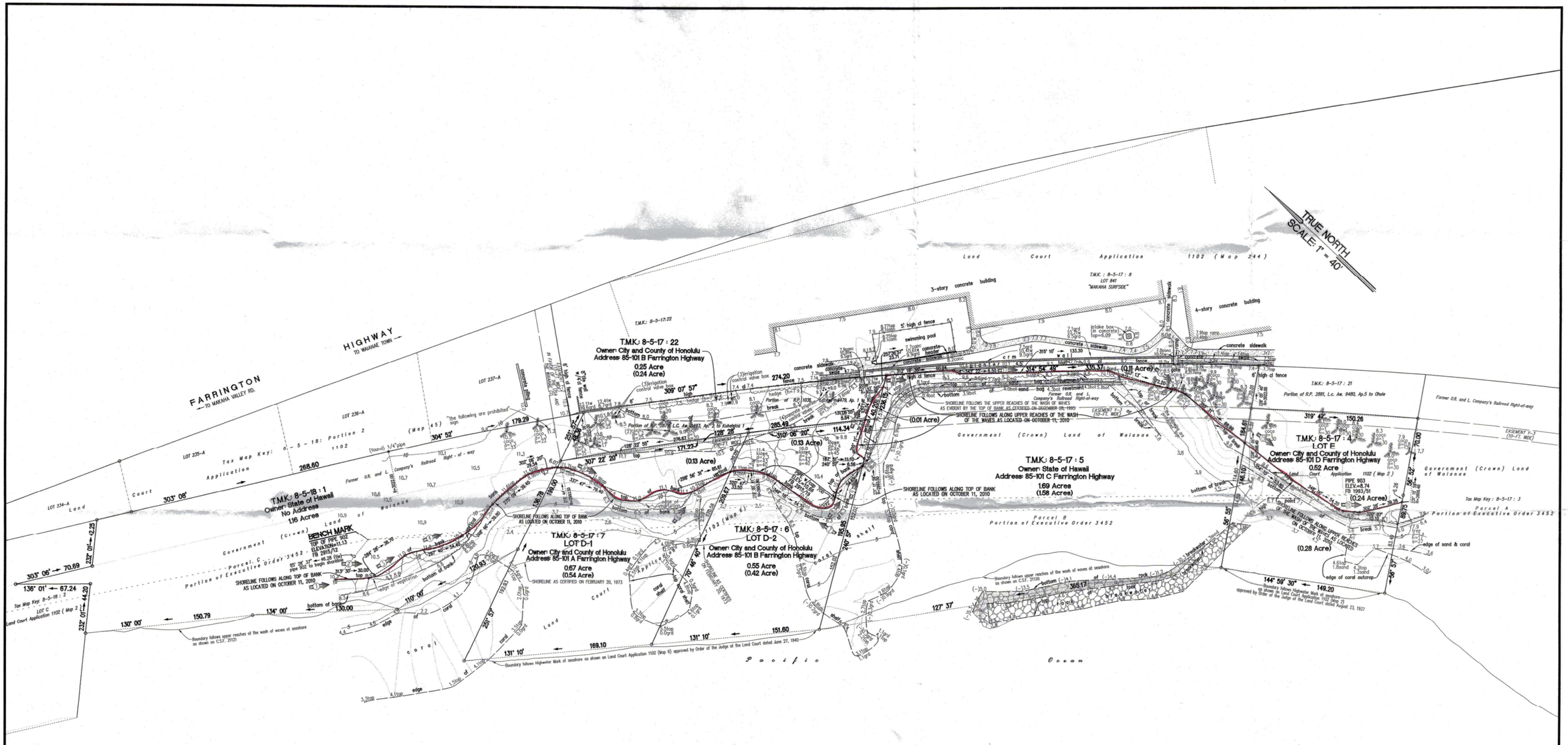
MAUNA LAHILAHI BEACH PARK
ROCK REVETMENT

EROSION CONTROL PLAN

JOB NO. 05-P-20
DRAWING NO. C-4
SHEET NO. 07 OF 16
FILE NO. 115/012

Attachment 3

COPY OF CERTIFIED SHORELINE MAP



The shoreline as delineated in red is hereby certified as the shoreline as of

OCT 17 2011

Chairperson, Board of Land and Natural Resources

NOTES:

1) UNDERGROUND PUBLIC UTILITIES SHOWN HEREON ARE FOR INFORMATION ONLY. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION.

2) ORIGIN OF COORDINATES: COORDINATES ARE REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "PAHEEHEE NEW" △.

3) ORIGIN OF BENCH MARKS: BENCH MARKS REFERRED TO TO C&GS BRASS DISK N 14, ELEVATION = 10.482.

SEPTEMBER 14, 2011
DATE: DECEMBER 28, 2010
FIELD BOOK NO. 2915

40 20 0 80
GRAPHIC SCALE : 1"=40'

MAP SHOWING SHORELINE
FRONTING MAUNA LAHILAHI BEACH PARK
AT WAIANAE-KAI, WAIANAE, OAHU, HAWAII

WAYNE M. TERUYA
LICENSED PROFESSIONAL LAND SURVEYOR
No 6297
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
ParEn, Inc.
dba PARK ENGINEERING

LICENSED PROFESSIONAL SURVEYOR
CERTIFICATE NUMBER 6297

TAX MAP KEY: 8-5-17: 4,5,6,7 and 8-5-18: por.1

ParEn, Inc. dba Park Engineering
Pacific Park Plaza Suite 1500 711 Kapiolani Blvd Honolulu, Hawaii 96813
808-955-1676

DEPARTMENT OF PARKS & RECREATION

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 309, Kapolei, Hawaii 96707
Phone: (808) 768-3003 • Fax: (808) 768-3053
Website: www.honolulu.gov

KIRK CALDWELL
MAYOR

TONI P. ROBINSON
DIRECTOR

JEANNE C. ISHIKAWA
DEPUTY DIRECTOR

July 5, 2013

MEMORANDUM

TO: Chris T. Takashige, P. E., CCM, Director
Department of Design and Construction

FROM: Toni P. Robinson
Director

SUBJECT: Draft Environmental Assessment
Mauna Lahilahi Beach Park Rock Revetment

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Mauna Lahilahi Beach Park Revetment Project.

The Department of Parks and Recreation has no comment.

Should you have any questions, please contact Mr. John Reid, Planner, at 768-3017.

TPR:jr
(514011)

cc: Office of Environmental Quality Control
Clifford Lau, Facilities, DDC
Dayananda Vithanage, Oceanit Laboratories, Inc.

oceanit
innovation through engineering & scientific excellence

October 29, 2013

Toni P. Robinson, Director
Department of Parks and Recreation
1000 Uluohia Street, Suite309
Kapolei, HI 96707

Subject: Draft of Environmental Assessment
Mauna Lahilahi Beach Park Rock Revetment

Dear Ms. Robinson:

On behalf of the Department of Design and Construction, thank you for reviewing the Draft Environmental Assessment.

Sincerely,

Dayananda Vithanage, P.E., Ph.D.
Director of Engineering
Oceanit

Att.

520034

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

RECEIVED
DEPT OF DESIGN & CONSTR
C & C OF HONOLULU
13 JUN 25 PM 3:07

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
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STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

DLNR.OCCL.BR

Correspondence: OA-13-159

JUN 21 2013

Mr. Chris T. Takashige, P.E., CCM, Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, HI 96813

Dear Mr. Takashige,

SUBJECT: Comments on The Draft Environmental Assessment (EA) for Rock Revetment at at Mauna Lahilahi Beach Park, Waianae, Oahu, Hawaii, TMK (1) 8-5-017:005.

The Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands (OCCL) has reviewed the April, 2013 Draft Environmental Assessment (Draft EA) for a proposed Rock Revetment at Mauna Lahilahi Beach Park, Waianae, Oahu, Hawaii, TMK (1) 8-5-017:005. Oceanit Company on behalf of the City and County of Honolulu, Department of Design and Construction (the County) is proposing construction of a rock revetment fronting the shoreline of the subject property.

The proposed construction site is in a small cove fronting a narrow portion of Mauna Lahilahi Beach Park and the Makaha Surfside Apartments on the leeward (west) coast of Oahu. The shoreline at the proposed project site is characterized by an existing rock and sandbag revetment, with a limestone headland to the north, small pocket beach to the south, and rock breakwall offshore. The beach fronting the proposed project site was lost to erosion over the past several decades due to chronic sand loss and is also attributed in the Draft EA to high waves from hurricanes Iwa (1982) and Iniki (1992).

The proposed rock revetment would replace an existing rock and sandbag revetment, which was initially placed in 1999 as a temporary response to severe coastal erosion that threatened the backshore area. In 2003 a breakwater was constructed at the mouth of the small embayment and the shoreline was nourished with 5,000 cubic yards of sand to restore the public beach resources in the park (DLNR ref. CDUP OA-3005B; October 19, 2000). The sandbag portion of the existing structure was removed at that time. Waves coming through the northern opening in the breakwater rapidly eroded the nourished beach, moving sand to the southern end of the cove and again exposing the rocks at the backshore. The sandbag portion of the structure was reconstructed shortly thereafter in response to backshore erosion and wave overtopping.

The County is proposing a sloped rock revetment (the Revetment) with a crest approximately 10 feet above sea level and width of approximately 40 to 45 feet. The County also proposes adding approximately 10 to 15 of gravel backfill behind the north and central portions of the structure, making the total width (footprint) of the structure between 40 and 60 feet on submerged State lands. The County recommends this as the preferred design alternative "to minimize property damage caused by waves that enter the cove and overtop the embankment."

OCCL has conducted a thorough review of the Draft EA and finds the document complete, overall. However, **OCCL has several comments on technical aspects of the Draft EA, which we feel should be addressed in the Final EA.**

2.1 Description of Alternatives.
Based on the Rock Revetment Plan View (Figure 3-12) and Rock Revetment Cross Sections (Figure 3-13) in the Draft EA, it appears that the Revetment will have a cross section width of between 40 and 60 feet, including the gravel backfill area. OCCL suggests adding description and consideration of alternative erosion control structure designs with reduced footprints compared to the preferred alternative in the Final EA. A reduced footprint will reduce impacts to the marine substrate and maximize the usable space for recreation (*e.g.*, swimming, canoe launching) within the cove. Additional alternatives that OCCL would like to see considered and discussed in the Final EA include a vertical seawall and a hybrid seawall/revetment structure, as well as designs not including substantial backfill (*e.g.*, build a structure against the existing erosion scarp).

To provide a more informed comparison of alternative erosion control methods please provide estimated costs for construction for each design alternative considered.

3.2 History of Project Area
In the last paragraph of this section, please provide analysis of results from beach surveys conducted from 2003 to 2008, including an assessment of recent stability of the remaining (nourished) pocket beach at the south end of the project site cove (*e.g.*, annual shoreline recession, beach volume loss).

3.4.2 Rock Revetment Design
Please include the spatial dimensions of the proposed Revetment design including length, width, height, footprint area, and elevations above tidal datum. For comparison, please provide dimensions of the existing sandbag and rock revetment.

The proposed Revetment design includes approximately 15 feet of gravel backfill between the existing erosion scarp and revetment. Please provide a more thorough description of and justification for the gravel backfill. What would be the effect of building the rock revetment without the "rock and gravel drainage and splash area" behind the revetment? Please expand on your justification regarding the need for the gravel backfill area.

What type of rock is proposed for the armor stone on the proposed Revetment? Please discuss the benefits and drawbacks of using either basalt or limestone armoring stone. For example, would limestone provide a cost effective alternative to basalt that would be more esthetically (and perhaps environmentally) suitable for this section of rocky limestone coast?

5.1.2 Erosion

Please provide a more thorough assessment of the recent dynamics and stability of the beach at the south end of the project site cove from beach survey monitoring and/or recent observations. How will the proposed Revetment design affect the dynamics or stability of the remaining beach?

Thank you for the opportunity to comment on the Draft EA for this project, and for recognizing that a DLNR Conservation District Use Permit will be required for the proposed Revetment. Please contact Sea Grant Extension Agent Brad Romine at OCCL, at 587-0049 or Bradley.M.Romine@Hawaii.gov, should you have any questions.

Sincerely,

SAMUEL J. LEMMO, Administrator
Office of Conservation and Coastal Lands

CC: OEQC
Hon C&C, Dept of Design and Construction, Clifford Lau
Oceanit, Dayananda Vithanage

oceanit
innovation through engineering & scientific excellence

January 22, 2014

Mr. Samuel J. Lemmo, Administrator
State of Hawaii
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
Post Office Box 621
Honolulu, HI 96809

Subject: Comments on The Draft Environmental Assessment (EA) for Rock Revetment at Mauna Lahilahi Beach Park, Wai`anae, O`ahu, Hawai`i, TMK (1) 8-5-017:005

Dear Mr. Lemmo:

On behalf of the City and County of Honolulu Department of Design and Construction, thank you for your comments on the subject Draft EA. Your comment letter is attached. A listing of your comments in italics and our response to each follows.

Comment:

2.1 Description of Alternatives.

Based on the Rock Revetment Plan View (Figure 3-12) and Rock Revetment Cross Sections (Figure 3-13) in the Draft EA, it appears that the Revetment will have a cross section width of between 40 and 60 feet, including the gravel backfill area. OCCL suggests adding description and consideration of alternative erosion control structure designs with reduced footprints compared to the preferred alternative in the Final EA. A reduced footprint will reduce impacts to the marine substrate and maximize the usable space for recreation (e.g., swimming, canoe launching) within the cove. Additional alternatives that OCCL would like to see considered and discussed in the Final EA include a vertical seawall and a hybrid seawall/revetment structure, as well as designs not including substantial backfill (e.g., build a structure against the existing erosion scarp).

To provide a more informed comparison of alternative erosion control methods, please provide estimated costs for construction for each design alternative considered.

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177

Response:

The primary problem at the shoreline is that waves surge through the breakwater gap and run up over the top of the embankment causing erosion and damage to the existing sandbag revetment and to private inland structures. To mitigate the runup and overtopping, the new revetment will be moved seaward and backfilled with gravel on the north end opposite the breakwater gap. This additional space and gravel fill is intended to slow and dissipate the moving water and allow it to drain back through the rock and gravel to the ocean. The larger footprint will allow the revetment to better protect the backshore area.

There are several alternative erosion control structures that could be constructed in place of the proposed rock revetment. A second rock breakwater or groin placed inside and parallel to the existing breakwater was considered earlier in planning for the project. The additional breakwater would block the wave transmission through the existing breakwater gap that now causes overtopping and backshore damage. The additional breakwater would still allow water circulation in the area between the breakwaters and the shoreline. A vertical seawall was not considered, because a seawall reflects waves that could increase beach erosion and because the appearance of a vertical seawall does not aesthetically match the surrounding shoreline very well. However, the City and County selected a rock revetment rather than a second breakwater as their desired option. The revetment was selected in part because it would provide better along-shore access to park users after the existing sandbag revetment was removed.

Three revetment alternatives were considered during the design process. Alternative 1 was a revetment with a CRM seawall extending above the top of the revetment to reduce wave overtopping. Alternative 2 was a rock revetment with a higher and wider crest to reduce overtopping. Alternative 3 was a rock revetment that was moved seaward so that waves are intercepted sooner and travel over a wider rock and gravel area before reaching the mauka property. The wide rock and gravel area allows wave energy to dissipate and seawater to drain back into the ocean through the rock and gravel filter.

Oceanit made rough cost estimates for alternative designs shown in the following table. Typically a seawall will cost more than a rock revetment because a CRM grouted rock wall would be constructed by a mason while a rock revetment is not grouted and is set by an excavator. A cast-in-place concrete seawall is usually more expensive than a rock wall and does not appear as natural in the Mauna Lahilahi Park environment.

MAUNA LAHILAHI BEACH PARK
ROCK REVETMENT COST ESTIMATE

MATERIALS AND CONSTRUCTION	
ALTERNATIVE 1	$720,000
ALTERNATIVE 2	$895,000
ALTERNATIVE 3	$775,000

A shore protection structure built against the existing eroded slope will not give sufficient space to reduce and disperse the wave energy. The waves will instead continue to overtop the structure and cut erosion gullies in the area behind the structure. A vertical seawall would require a deep footing with a wide base to be excavated in the existing hard but fractured substrate that is now beneath the sandbag revetment. The base of the wall would have to be placed below potential wave scour depth. A vertical seawall would reflect incoming waves more than a sloping revetment and cause more beach erosion. A seawall with a rock toe might cause less wave reflection. Another problem with a wall up against the eroded escarpment is that lateral access along the shoreline could be restricted for both people and park maintenance equipment. A vertical seawall can be made of grouted rock or reinforced concrete.

Comment:

3.2 History of Project Area

In the last paragraph of this section, please provide analysis of results from beach surveys conducted from 2003 to 2008, including an assessment of recent stability of the remaining (nourished) packet beach at the south end of the project site cove (e.g., annual shoreline recession, beach volume loss).

Response:

After placement in 2003, the nourished sand quickly moved to the south side of the cove and formed a beach between the breakwater and the shoreline. The beach configuration soon stabilized in a shape that provided a good recreational area especially for children. Some sand washed out through the breakwater stones and some was washed over the root end of the breakwater. This sand eventually built a small down-drift beach where a beach had previously existed many years ago.

No further beach studies were conducted after the last monitoring run in October 2008. Copies of all the beach monitoring reports were provided to OCCL.

Comment:

3.4.2 Rock Revetment Design
Please include the spatial dimensions of the proposed revetment design including length, width, height, footprint area, and elevations above tidal datum. For comparison, please provide dimensions of the existing sandbag and rock revetment.

Response:

The proposed revetment is approximately 322 feet long. The width of armor stone varies from 35-40 feet with 0-12 feet of crushed rock inland of the stone. The height extends from -4 feet to +11 feet relative to mean sea level (MSL). The existing sandbag and rock revetment is approximately 109 feet long. The top elevation of the bags is 10 feet above MSL.

Comment:

The proposed revetment design includes approximately 15 feet of gravel backfill between the existing erosion scarp and revetment. Please provide a more thorough description of and justification for the gravel backfill. What would be the effect of building the rock revetment without the "rock and gravel drainage and splash area" behind the revetment? Please expand on your justification regarding the need for the gravel backfill area.

Response:

The primary problem at the project site is that waves entering through the breakwater gap run up and overtop the north end of the sandbag revetment. The return flow erodes the backshore area and undermines the sandbags causing them to slide and break. The purpose for moving the proposed revetment farther offshore and backfilling with rock and gravel is to minimize the runup and overtopping and provide a drainage area for the water to filter back into the ocean without damaging the structure. The revetment itself has been raised slightly to better handle runup. This design also reduces the frequency of wave inundation into the privately owned backshore area.

Comment:

What type of rock is proposed for the armor stone on the proposed revetment? Please discuss the benefits and drawbacks of using either basalt or limestone armoring stone. For example, would limestone provide a cost effective alternative to basalt that would be more esthetically (and perhaps environmentally) suitable for this section of rocky limestone coast?

Response:

The existing breakwater was constructed from basalt fieldstone that was obtained from a contractor in Wai`anae. The hauling distance is relatively short thereby reducing cost. There is a large quantity of basalt field fieldstone along the Wai`anae coast. And the rock is the right size and density for armor stone. Limestone is generally less dense than basalt; however, either limestone or basalt can be used for revetment construction and the choice may depend on cost. Limestone armor stone is not as available as basalt field stone. Aesthetically, when the rock is in water and has marine growth, it is not always obvious what kind of rock it is.

Comment:

5.1.2 Erosion
Please provide a more thorough assessment of the recent dynamics and stability of the beach at the south end of the project site from beach survey monitoring and/or recent observations. How will the proposed revetment design affect the dynamics or stability of the remaining beach?

Response:

Other than by visual observation, the beach has not been surveyed or monitored since 2008. Observations reveal that the beach is fairly stable. Some sand has been pushed around or through the existing breakwater and has partially rebuilt a small beach on the down-drift (south) limestone shoreline where a beach previously existed. Oceanit does not believe that the new revetment will significantly change the beach stability. But by reducing wave reflection, the revetment may slow future sand migration.

Please contact me or Dr. Warren Bucher at 531-3017 if you need additional information.

Sincerely,

Dayananda Vithanage, P.E., Ph.D.
Director of Engineering
Oceanit

att

UNIVERSITY of HAWAI'I®
MĀNOA

Water Resources Research Center

June 24, 2013
EA: 2013-05-23-03

Mr. Clifford Lau, Chief
Facilities Division
Department of Design & Construction
City & County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813
VIA FAX TO: 768-4567

Dear Mr. Lau:

Draft Environmental Assessment
Mauna Lahilahi Shoreline Beach Park Rock Revetment
Waianae, Oahu

The City & County of Honolulu (CCH) proposes to construct a rock revetment that would replace a temporary sandbag revetment in order to further minimize erosion of a lateral shoreline access path and private residential property. This review of CCH's Draft Environmental Assessment (DEA) for the Mauna Lahilahi Shoreline Beach Park Revetment is a service activity of the University of Hawaii's Water Resources Research Center (WRRC) to help determine and maintain the optimum quality of the environment. It does not represent the official views of the University of Hawaii. The objectives of our review process are to enhance environmental consciousness, encourage cooperation and coordination, and facilitate public participation.

Previous comments from the University of Hawaii's Environmental Center on CCH's 2001 Final EA for Proposed Shore Protection and 2010 DEA for Shoreline Erosion Protection are incorporated herein to the extent that they remain applicable, particularly with regard to public benefits, private cost sharing, construction site access planning, cultural resource protection, and alternatives analysis. In particular:

1. In 2010 the Environmental Center suggested that CCH consult with the Oahu Island Burial Council and the CCH Ocean Safety & Lifeguard Services Division. It is unclear whether or not such consultation has occurred in the interim.

2. In 2010 the Environmental Center also suggested that CCH consider an alternative to raise the existing breakwater. It is unclear whether or not this alternative was further evaluated in the interim.

2540 Dole Street, Holmes Hall 283
Honolulu, Hawai'i 96822
Telephone: (808) 956-7847
Fax: (808) 956-5044

3. The Environmental Center suggested in 2010 that CCH consider alternatives that might couple a rock revetment set "as far mauka as possible" with large-scale beach nourishment. However, the rock revetment location now proposed would be makai of the existing temporary sandbag revetment. How might these two alternatives compare in providing usable public beach area that benefits the community?

REFERENCES:

Oceanit, 2010, Mauna Lahilahi Beach Park Shore Protection, Draft Environmental Assessment, Prepared for City & County of Honolulu, Department of Design & Construction.

Rappa, P., 2010, Letter dated October 22, 2010 (EA: 00320) from Environmental Coordinator, Environmental Center, University of Hawaii at Manoa, to Mr. Clifford Lau, Chief, City & County of Honolulu Department of Design & Construction, Draft Environmental Assessment, Mauna Lahilahi Beach Park Shoreline Erosion Protection Project.

Thank you considering these comments on the City & County of Honolulu's Draft Environmental Assessment for the Mauna Lahilahi Shoreline Beach Park Rock Revetment. Please send us a printed copy of the Final Environmental Assessment when it is published. Also, please note that the University of Hawaii's Environmental Center has merged with the Water Resources Research Center and no longer exists as an officially named unit within the university. Therefore, please address future correspondence to:

Water Resources Research Center
University of Hawaii at Manoa
2540 Dole Street, Holmes 283
Honolulu, HI 96822
ATTN: Environmental Assessment & Protection Division

Sincerely,

David Penn

David Penn
Assistant Specialist

cc: State of Hawaii Office of Environmental Quality Control
Chittaranjan Ray, Interim Director, Water Resources Research Center
Oceanit Laboratories, Inc. (Dayananda Vithanage)
Sara Bolduc

oceanit
innovation through engineering & scientific excellence

October 22, 2013

Dr. David Penn, Assistant Specialist
University of Hawaii
Water Resources Research Center
2540 Dole Street, Holmes Hall 283
Honolulu, HI 96822

Subject: Draft Environmental Assessment
Mauna Lahilahi Beach Park Rock Revetment

Dear Dr. Penn:

On behalf of the City and County of Honolulu (CCH) Department of Design and Construction (DDC), thank you for reviewing and commenting on the Draft Environmental Assessment. Your comment letter is attached. A listing of your comments and our response to each follows:

Comment:

In 2010 the Environmental Center suggested that CCH consult with the Oahu Island Burial Council and the CCH Ocean Safety & Lifeguard Services Division. It is unclear whether or not such consultation has occurred in the interim.

Response:

The Department and Oceanit have had a number of meetings and discussions with representatives of the Wai`anae Hawai`ian community regarding the cultural and burial sites at Mauna Lahilahi Beach Park. Both DDC and Oceanit have retained archaeologists to provide advice and coordination on how exposed *`iwi* and cultural areas should be handled. Members of the Hawai`ian community have been discussing the use of burial structures for re-internment of exposed *`iwi* throughout the local area. The Draft EA was sent to the Burial Council for review and comment; however, no comments were received.

There has been no discussion with the Ocean Safety & Lifeguard Services Division regarding the construction of the rock revetment at Mauna Lahilahi Beach Park. There is no lifeguard station at this beach park.

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177

Comment:

In 2010 the Environmental Center also suggested that CCH consider an alternative to raise the existing breakwater. It is unclear whether or not this alternative was further evaluated in the interim.

DDC Response:

The shoreline erosion and wave overtopping problem would not have been solved by raising the existing breakwater. The problem was caused by waves that reached the shoreline after traveling through the gap between the end of the breakwater and the limestone side of the cove. We considered placing another breakwater across the gap. But the selected solution preferred by the Department of Parks and Recreation was the proposed rock revetment.

Comment:

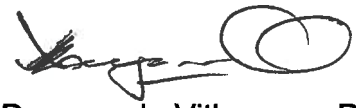
The Environmental Center suggested in 2010 that CCH consider alternatives that might couple a rock revetment set "as far mauka as possible" with large-scale beach nourishment. However, the rock revetment location now proposed would be makai of the existing temporary sandbag revetment. How might these two alternatives compare in providing usable public beach area that benefits the community?

DDC Response:

The position of the proposed revetment is makai of the existing sandbag revetment so that wave runup will have sufficient space to dissipate wave energy and drain back into the ocean through the revetment rocks. With the existing sandbag revetment, waves were running over the top and into inland property while damaging the underlying embankment. The existing nourished beach that was built in 2003 has mostly stabilized. Sand for beach nourishment is not readily available and is very expensive; therefore, the Department of Parks and Recreation prefers to stabilize the shoreline with a rock revetment rather than placing more sand. The main Mauna Lahilahi Beach is only a short walk north.

Please contact me or Dr. Warren Bucher at 531-3017 if you need further information.

Sincerely,



Dayananda Vithanage, P.E., Ph.D.
Director of Engineering
Oceanit

att

cc: CCH/DDC

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

ESTHER KIAAINA
FIRST DEPUTY

WILLIAM M. TAM
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AQUATIC RESOURCES
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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, HAWAII 96707

March 7, 2014

Mr. Chris T. Takashige, P.E., CCM, Director
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

LOG NO: 2013.3225, 2013.3278
DOC NO: 1403NN03

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
Draft Environmental Assessment for Mauna Lahilahi Beach Park Rock Revetment
Māhaka Ahupua'a, Waianae District, Island of O'ahu
TMK: (1) 8-5-017: 005, and portions of :004, 006 and 007

Thank you for requesting our comments on the draft environmental assessment (DEA) in connection with the proposed action to construct a rock revetment to replace the temporary sandbag revetment along the shoreline in order to minimize erosion of the lateral access path and along the Mākaha Surfside property. The DEA was prepared by Oceanit Laboratories, Inc. on behalf of the City and County of Honolulu, Department of Design and Construction, Wastewater Division. The DEA indicates primary site access for construction equipment will be from Waianae High School to the south and possibly from the north side of Makaha Surfside. We received the DEA on May 8, 2013; we sincerely apologize for the delay and thank you for your patience.

Mauna Lahilahi Beach Park Revetment Background

The project area is a small cove off the southeast end of Mauna Lahilahi Beach Park at 85-101C Farrington Highway. Mauna Lahilahi Beach Park is managed by the City and County of Honolulu's Park and Recreation Division while the submerged lands are managed by the State of Hawaii's Department of Land and Natural Resources. Mauna Lahilahi Beach Park has been subjected to wave and shoreline erosion since 1949. In the late 1990s, a sandbag revetment was constructed to stabilize the embankment that had partially eroded into the Makaha Surfside property. In 2003, the existing shore-connected breakwater was constructed to shelter the sand cove fronting the Makaha Surfside apartments. Following beach re-nourishment, the sandbag revetment was removed. However, subsequently the nourished sand has again pushed between the breakwater and the shoreline embankment. This action has left the backshore at the cove's northeast corner exposed to further erosion by waves moving through the gap between the existing breakwater and the rock shoreline. As a result, the access road that ran along the edge of the park property has been lost to erosion, and the sandbag revetment needs rebuilding. The proposed project involves removing the sand revetment and constructing a new rock revetment along the inner shoreline of the cove across from the existing gap in the breakwater.

Historic Properties Background

Our records indicate that this area is known to contain historic properties, including subsurface intact cultural layers (50-80-07-6634, 50-80-07-6592), human burials containing multiple individuals in several areas (50-80-07-4064), a re-internment crypt (R1992-1-001-001), a rectangular alignment (50-80-07-6635), and a remnant of the former Badayos home. The intact cultural layers are located between the middle of the surfside apartments and the northwest drainage of the park, with the uppermost layer beginning at 25 cm below current ground surface (Log No. 2622, Doc. No. 0009RC11). Burials are associated with these habitation deposits, and our office has been monitoring and recording these deposits since 1999. Additionally, our records indicate that the City and County of Honolulu's Park and Recreation Division has provided a re-internment site for human skeletal remains on TMK: (1) 8-5-017:007. Also, the former Badayos residence and the Badayos re-internment site are located on the Waianae High School end of the shoreline area (TMK: (1) 8-5-017:014). Additionally, cultural deposits have been recorded nearby on TMK: (1) 8-5-017:003 and 004, and possibly on TMK: (1) 8-5-001:021 (Cultural Surveys Hawaii, Perzinski 2004).

Of primary concern is that the cultural deposits may exist in the intact sand deposit behind the current sand revetment area. As such, extreme caution is needed not to damage the sandy face protecting any subsurface archaeological deposits that may exist in the area, including human skeletal remains. This concern is heightened by the need for construction and equipment access to extend through an area known to contain historic properties while ensuring this access does not cause slumping of beach faces and exposure and/or damage of buried cultural layers and/or burials.

Recommendations

In an effort to minimize possible impacts on historic properties, we request that the following recommendations be implemented as part of this project:

1. A project specific archaeological monitoring plan should be prepared that meets the requirements specified in Hawaii Administrative Rule §13-279-4, and include:
   a. An explicit machine and equipment access and staging plan detailing all measures and actions that will be implemented to ensure avoidance of cultural deposits and human burials; and
   b. A stipulation that due to the high sensitivity of the area for non-burial and burial historic properties, a minimum of one archaeological monitor will be assigned and on site for every piece of machinery being operated.
2. That the permit not be issued until our office has reviewed and approved the archaeological monitoring plan to ensure it meets the requirements stipulated in HAR §13-279-4 and the above provisions.

We also request that the DEA be revised to include the above information, as well as, the information provided in our division's previous correspondence concerning projects within Mauna Lahilahi Beach Park. SHPD staff are available to assist you during your research.

Please contact Deona Naboa at (808) 692-8015 or at Deona.Naboa@Hawaii.gov if you have any questions regarding this letter.

Aloha,

Susan A. Lebo

Susan A. Lebo, PhD
Oahu Lead Archaeologist

cc:
Office of Environmental Quality of Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Mr. Clifford Lau
Facilities Division
City and County of Honolulu
Department of Design and Construction
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Dayananda Vithanage
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 86816

Toni Robinson, Director
City and County of Honolulu
Parks and Recreation Division
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

Jesse Paahana
Army Corp of Engineers
Regulatory Branch, Honolulu District
Jessie.K.Paahana@usace.army.mil

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April 9, 2014

Dr. Susan A. Lebo
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Room 555
Kapolei, HI 96707

Subject: Comments on The Draft Environmental Assessment (EA) for Rock Revetment at Mauna Lahilahi Beach Park, Wai`anae, O`ahu, Hawaii, TMK (1) 8-5-017:005

Dear Dr. Lebo:

On behalf of the City and County of Honolulu Department of Design and Construction, thank you for the comments from the State Historic Preservation Division on the subject Draft EA. Your comment letter is attached. A listing of your comments in italics and our response to each follows:

Comment:

1. *A project specific archaeological monitoring plan should be prepared that meets the requirements specified in Hawaii Administrative Rules 13-279-4, and include:*
    a. *An explicit machine and equipment access and staging plan detailing all measures and actions that will be implemented to ensure avoidance of cultural deposits and human burials; and*
    b. *A stipulation that due to the high sensitivity of the area for non-burial and burial historic properties, a minimum of one archaeological monitor will be assigned and on site for every piece of machinery being operated.*
2. *That the permit not be issued until our office has reviewed and approved the archaeological monitoring plan to ensure it meets the requirements stipulated in HAR 13-279-4 and the above provisions.*

Response:

A project specific archaeological monitoring plan will be prepared by a qualified archaeologist to meet the requirements of items 1 and 2 above. Item 2 refers to the Corps of Engineers Permit that is currently being coordinated with SHPD.

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177

Comment:

> *We also request that the DEA be revised to include the above information, as well as, the information provided in our division's previous correspondence concerning projects within Mauna Lahilahi Beach Park.*

Response:

Oceanit received SHPD comments on February 6, 2001 regarding construction of the existing breakwater, which was finished in 2003. On October 20, 2010, we received comments on a proposed second breakwater project. This second project was cancelled by the City and County, and the proposed rock breakwater project has replaced it. Copies of these documents and discussion on monitoring will be included in the Final Environmental Assessment.

Please contact me or Dr. Warren Bucher at 531-3017 if you need additional information.

Sincerely,

Dayananda Vithanage, P.E., Ph.D.
Director of Engineering
Oceanit

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