US Army Corps
of Engineers
Honolulu District

Public Notice of Application for Permit

Regulatory Branch (1145b)
Building 230
Fort Shafter, Hawaii 96858-5440

Public Notice Date: June 7, 2013
Expiration Date: July 7, 2013
Permit File Number: POH-2012-00271

Interested parties are hereby notified that an application has been received for a Department of the Army (DA) permit for certain work in waters of the United States as described below and shown on the attached drawings.

APPLICANT: Mr. Scott Head, Waikoloa Development Company, 69-152 Waikoloa Beach Drive, Waikoloa, Hawaii 96738.

AGENT: Mr. Scott Sullivan, Sea Engineering, Inc. 41-305 Kalanianaole Highway, Waimanalo, Hawaii 96795.

LOCATION: Pacific Ocean at Anaehoomalu Bay, Hawaii Isle, Hawaii. TMK: (3) 6-9-007: 011
Coordinates: 19.91511 °N, 155.89100 °W.

WORK: The applicant proposes to rebuild the Kuualii Fishpond rock wall, dredge sand infill from the fishpond, and restore the sand beach fronting the fishpond with the dredged sand. The rock wall and beach were damaged by the March 11, 2011 tsunami generated by a massive earthquake off the coast of Japan. Following the tsunami, the U.S. Army Corps of Engineers (Corps) authorized emergency repairs to stabilize the breach in the beach from further erosion while a permanent restoration plan was developed. The currently proposed work would return the fishpond to its pre-tsunami condition.

Although only the middle 220-ft wide portion of the wall was damaged by the tsunami, the applicant proposes to replace the entire 690 linear feet of rock wall within the fishpond to ensure stability throughout the structure. Activities to reconstruct the rock wall would involve complete demolition, excavation, and temporary removal of the existing cemented rock wall including underlying foundation and surrounding cover (sand) material. Usable rock wall material would be reserved from the demolition of the existing wall for reuse in the construction of the proposed wall, with additional fill material added as needed (see plans in Appendix A). The footprint of the reconstructed wall would be 690 feet long by 6 feet wide. An estimated 580 cubic yards of stone and 190 cubic yards of concrete rubble masonry (CRM) material would be placed below the high tide line, which was approximated to the mean higher high (MHHW) elevation of +2.1 feet, filling a 4,140 square feet (0.095 acre) area.

The applicant also proposes to dredge approximately 800 cubic yards of sand from within the fishpond with the intention of disposing the dredged material on-site in an upland area above of the high tide line.. Dredging activities would utilize mechanical equipment (i.e., excavator with bucket) working only from the fishpond's adjacent bank. No hydraulic or suction equipment would be used; therefore, no water slurry would be generated and there would be no need to dewater effluent from the dredged material. A turbidity barrier would be placed in the pond around the work area and dredged sand would be initially placed within the confines of a sand berm creating using existing sand on the beach crest to be evenly distributed upon completion of dredging activities. The work would not include dredging activities to recover sand in nearshore water areas outside of the fishpond.

PURPOSE: Fishpond maintenance.

ADDITIONAL INFORMATION: Kualii Fishpond is a "*loko puuone*", or sand dune pond, located adjacent to the Pacific Ocean at Anaehoomalu Bay and the Waikoloa Beach Marriott Resort. Until tsunami waves caused a breach in the beach fronting the fishpond, the fishpond maintained a limited and indirect connection to the ocean through a sluice from the neighboring Kahapapa Fishpond. In the 1980s, the resort constructed the rock wall to line the *makai* or shoreward edge of the pond to prevent sand from migrating inland and filling the fishpond. However, the March 11, 2011 tsunami caused a 100-foot wide breach through the beach sand dune and damaged an approximately 220 linear ft portion of the rock wall. The event also displaced an estimated 9,000 cubic yards of sand from the beach, pushing sand into the pond and pulling it offshore into shallow waters.

In July 2011, the Corps issued POH-2011-93 authorizing initial emergency work to stabilize the beach and tsunami-damaged rock wall. The emergency work consisted of the temporary installation of six (6) 120-ft long by 15-ft circumference sand-filled barrier tubes at the breach. Since then, sand has gradually accumulated back to rebuild the beach and has partially buried the sand tubes. Removal of the sand tubes would require excavation and cause the protective sand berm to destabilize, resulting in further beach erosion. As a result, the applicant proposes to leave the sand-filled tubes permanently in place.

Project plans (Appendix A) and a Best Management Practices Plan (BMPP) (Appendix B) are included with this notice.

MITIGATION: The need to repair the damaged rock wall and restore pond depth in waters of the U.S. made avoidance of impacts to waters of the U.S. not practicable. Some of the minimization measures described in the BMPP to protect the aquatic ecosystem include no stockpiling of construction materials in waters, restricting fueling related vehicles and equipments away from the water, daily inspections to ensure silt fences are functioning, and rubbish is disposed of properly. In addition, other measures are included to protect marine species and the public from impacts resulting from construction activities. Based on the aforementioned, the applicant proposes no additional mitigation as the project involves an in-kind and in-place replacement of an existing structure.

WATER QUALITY CERTIFICATION: The proposed action would result in a discharge of dredged or fill material into a water of the U.S. and would require authorization from the Corps under Section 404 of the Clean Water Act of 1972 (33 U.S.C. 1344) (CWA). Under Section 401 of the CWA, the Corps may not issue a permit for the described work until the applicant obtains a certification, or a waiver of certification, from the State of Hawaii, Department of Health, Clean Water Branch.

COASTAL ZONE MANAGEMENT ACT CERTIFICATION: The proposed action will affect land or water uses in the Coastal Zone. Under Section 307(c)(3) of the Coastal Zone Management Act of 1972, as amended (16 U.S.C. 1456(c)(3)) (CZMA), the Corps may not issue a permit for the described work until the applicant certifies that the described activity affecting land or water uses in the coastal

zone complies with the State's Coastal Zone Management (CZM) Program. The State's CZM Program has issued a *General Concurrence for Minor Federal Permit Activities for Hawaiian Fishpond Restoration, Repair, Maintenance, and Reconstruction,* dated May 3, 2013. The applicant is responsible for compliance with the listed conditions of the general concurrence, which includes a notification requirement to the State of Hawaii, Department of Business, Economic Development, and Tourism, Office of Planning, CZM Program

PUBLIC HEARING: Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider this application. Requests for public hearings must state clearly and concisely, the reasons and rationale for holding a public hearing.

CULTURAL RESOURCES: The latest published versions of the National and State Registers of Historic Places (NRHP and SRHP, respectively) have been consulted for the presence or absence of historic properties, including those listed in or eligible for inclusion in the NRHP. The Kualii Fishpond is bounded within tax map key (TMK) 3-6-9-007: 011, which may be within or adjacent to unspecified parcel(s) containing portions of the Ala Loa Foot Trail (site number 10 10 and 11, 334), an historic site listed on the SRHP. Because the historic site may be at or in parcels adjacent to the project area, a determination of effect will be made in consultation with the State Historic Preservation Officer (SHPO). This application is being coordinated with SHPO. Any comments SHPO may have concerning presently unknown archeological or historic data that may be lost or destroyed by work under the requested permit will be considered in our final assessment of the described work.

ENDANGERED SPECIES: Section 7 of the Endangered Species Act of 1973 (16 U.S. C. 1531 *et seq.*) (ESA) requires federal agencies to consult with the National Marine Fisheries Service (NMFS) and/or U.S. Fish and Wildlife Service (USFWS) on any action that may affect a species listed (or proposed for listing) under the ESA as threatened or endangered or any designated critical habitat. Concurrently with the issuance of this public notice, the USACE will evaluate the potential impacts to proposed and/or listed species and their designated critical habitat and provide consultation letters to the NMFS and/or USFWS, as required, with the USACE's effects determination for the proposed project.

ESSENTIAL FISH HABITAT: The proposed work is being evaluated for possible effects to Essential Fish Habitat (EFH) pursuant to Section 305(b) the Magnuson Stevens Fishery Conservation and Management Act of 1996 (16 U.S.C. 1855(b)) (MSFCMA) and associated federal regulations found at 50 CFR Part 600 Subpart K. The Honolulu District area of responsibility includes areas of EFH as Fishery Management Plans. We have reviewed the January 20, 1999, Western Pacific Fishery Management Council's Environmental Assessment to locate EFH area as identified by the National Marine Fisheries Service (NMFS). Concurrently with the issuance of this public notice, the USACE will evaluate the potential impacts to EFH and provide a consultation letter to the NMFS, as required, with the USACE's effects determination for the proposed project.

AUTHORITY: This permit application will be reviewed under the following authorities:

(X) Perform work in or affecting navigable waters of the United States – Section 10 of the Rivers and Harbors Act 1899 (33 U.S.C. 403).

(X) Discharge dredged or fill material into waters of the United States – Section 404 of the Clean Water Act (33 U.S.C. 1344). The Corps' public interest review will consider the guidelines developed under Section 404(b)(1) of the CWA, which are promulgated at 40 CFR Part 230.

( ) Transport dredged material for the purpose of dumping it into ocean waters - Section 103 Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1413). The Corps' public interest

review will consider the criteria established under authority of Section 102(a) of the Marine Protection, Research and Sanctuaries Act of 1972, as amended (40 CFR Parts 220 to 229), as appropriate.

EVALUATION: The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered, including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

The U.S. Army Corps of Engineers is soliciting comments from the public; Federal, State, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of this activity. Any comments received will be considered by the Corps to determine whether to issue, modify, condition, or deny a permit for the work. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the activity.

COMMENT AND REVIEW PERIOD: Conventional mail or e-mail comments on this public notice will be accepted and made part of the record and will be considered in determining whether it would be in the public interest to authorize this proposed work. In order to be accepted, e-mail comments must originate from the author's e-mail account and must include on the subject line of the e-mail message the permit applicant's name and reference number as shown below. All e-mail comments should be sent to **joy.n.anamizu@usace.army.mil**. Conventional mail comments should be sent U.S. Army Corps of Engineers, Honolulu District, Building 230 (Attn: CEPOH-EC-R/J. Anamizu), Ft. Shafter, HI 96858-5440. Both conventional mail and e-mail comments must include the permit applicant's name and reference number, as shown below, and the commentor's name, address, and phone number. **Both conventional mail or e-mail must reach this office, no later than the expiration date of this public notice to ensure consideration. Please include the reference number: POH-2012-00271.**

Comments on the described work, with the reference number, should reach this office no later than the expiration date of this Public Notice to become part of the record and be considered in the decision. Please contact Ms. Joy Anamizu at **(808) 835-4308** if further information is desired concerning this notice. This public notice is issued by the Chief, Regulatory Branch.

District Engineer.
U.S. Army, Corps of Engineers

Attachments

Appendix A: DA permit application and construction drawings
Appendix B: Best management practices plan

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-0003
EXPIRES: 31 August 2012

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This Information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME.
First - Scott Middle - Last – Head
Company – Waikoloa Development Company
E-mail Address – shead@waikoloaland.com

8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
First - Scott Middle - P Last – Sullivan
Company – Sea Engineering, Inc.
E-mail Address – ssullivan@seaengineering.com

6. APPLICANT'S ADDRESS.
Address - 69-152 Waikoloa Beach Drive
City – Waikoloa State – Hawaii Zip – 96738 Country –

9. AGENT'S ADDRESS
Address - 41-305 Kalanianaole Hwy
City – Waimanalo State – Hawaii Zip – 96795 Country –

7. APPLICANT'S PHONE NOs. W/AREA CODE.
a. Residence b. Business 808.886.1000 c. Fax 808.886.4810

10. AGENT'S PHONE NOs. W/AREA CODE
a. Residence b. Business 808.259.7966 c. Fax 808.259.3143

STATEMENT OF AUTHORIZATION

11. I hereby authorize, Sea Engineering, Inc. to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE 11/28/12 DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)
Permanent Tsunami Damage Repair of Kuualii Fishpond and Anaehoomalu Bay Beach, Waikoloa, Hawaii

13. NAME OF WATERBODY, IF KNOWN (if applicable)
Anaehoomalu Bay, Pacific Ocean

14. PROJECT STREET ADDRESS (if applicable)
Address N/A
City - Waikoloa State – Hawaii Zip - 96738

15. LOCATION OF PROJECT
Latitude: °N 19.54' 54.41"
Longitude: °W 155 53' 27.60"

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)
State Tax Parcel ID (3) 6-9-007:011 Municipality Anaehoomalu, Waikoloa, South Kohala, County of Hawaii
Section – Township – Range –

17. DIRECTIONS TO THE SITE

Project site is around 18 miles from Kona International Airport. Take Queen Kaahumanu Hwy north for about 17 miles, then turn west on Waikoloa Beach Drive and go just over 1.2 mile to the access road leading to the public parking lot.

18. Nature of Activity (Description of project, include all features)

Project will repair damage from the March 2011 tsunami to the fish pond wall by in-kind and in-place replacement and repair of the existing pond wall, removal of sand from the pond, and nourishment of the beach, as discussed in the attached Repair Plan.

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

Project is a restoration activity intended to restore functionality to the protective fish pond wall, dune, and beach system, that were all severely damaged during the March 2011 tsunami, as detailed in the attached Repair Plan.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

In-kind and in-place repair of tsunami damaged protective fish pond wall.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
Basalt Stone - up to 580 cy below mhhw	CRM - 190 cy below mhhw	CRM - 235 cy above mhhw

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres N/A

Or

Liner Feet N/A

23. Description of Avoidance, Minimization, and Compensation (see instructions)

As this is an in-kind and in-place replacement of an existing, but damaged wall, this activity should not have an impact that would require mitigation.

24. Is Any Portion of the Work Already Complete? Yes ☐ No ☑ IF YES, DESCRIBE THE COMPLETED WORK

N/A

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

Address – N/A

City – State – Zip –

26. List of Other Certifications or Approvals/Denials Received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
County of Hawaii	SMA Use Permit	pending			
State of Hawaii	Conservation District Use Permit	pending			

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT — DATE 11/28/12 — SIGNATURE OF AGENT — DATE 12/6/12

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

Anaehoomalu Bay Tsunami Damage Repair Plan

Anaehoomalu, Waikoloa, South Kohala, Hawaii

November 2012

Prepared for:
Waikoloa Beach Association

Prepared by:
Sea Engineering, Inc.
Makai Research Pier
Waimanalo, HI 96795

Job No. 25263

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1. INTRODUCTION

1.1 Location and General Description

Anaehoomalu Bay is located on the west coast of the island of Hawaii, approximately 20 miles north of the Kona International Airport and the town of Kailua-Kona, and 10 miles south of Kawaihae Harbor. Location and vicinity maps are shown on Figure 1-1. Kuualii and vicinity are TMK (3) 6-9-007:011, Anaehoomalu, Waikoloa, South Kohala, Hawaii, and the boundary of Lot 11 is shown on Figure 1-2. The sand beach inner bay shoreline is flanked by rocky lava basalt shorelines on both sides with an arc length of just under 1,100 feet between the old masonry channel at the north end and the first, low, basalt outcrop to the south. The beach fronts two fishponds, Kuualii , the larger of the two ponds, and Kahapapa pond next to it to the north. Because of their relationship with the adjacent beach and dune, these fishponds are classified as a loko puuone, or sand dune ponds. The pond area was described by Kikuchi and Belshe (1971) as "a very long, high sand dune fronts the pond, while the inland sides are bounded by an ancient pahoehoe flow". Kuualii and Kahapapa ponds are connected by a channel, and a channel through the shore at the north end of Kahapapa Pond connects both ponds to the sea and allows for some circulation and flushing of the pond waters. As Kuualii does not have a direct connection to the ocean, its only seawater circulation and exchange mechanism is through its connection with Kahapapa. However, there is a significant groundwater flow into the pond which aids in water exchange and pond flushing.

Many archaeological studies, surveys, and excavations have been conducted over the years in the vicinity of Kuualii and Kahapapa ponds (Corbin, 2011). The studies indicate a high concentration of archaeological sites, including C-shapes, burial caves, platforms, cairns, hearths, petroglyphs, walls, and other habitation features (Barrera, 1971). It is believed that settlement around Kuualii pond began about 800-900 A.D., and the pond was used for aquaculture (Barrera, 1971). However other investigators have concluded initial occupation in the 15th century, and continuing until the 17th century (Jenson, 1990). By the 1800s the area appears to have been abandoned and the pond had fallen into disuse and was poorly maintained.

A brief summary of the recent history of Anaehoomalu Bay and Waikoloa has been written by Chuck Dewitt, who became involved with maintenance of the pond and beach beginning in 1973. This document is unpublished; however copies are available at the resort. In the late 1800s Parker Ranch heirs acquired the lands of Anaehoomalu and Waikoloa Nui (the lands mauka of the bay). In 1968 Boise-Cascade Properties, Inc. bought Waikoloa/Anaehoomalu from Parker Ranch, a total of approximately 31,000 acres. Shortly thereafter development of a destination resort was initiated, and Queen Kaahumanu Highway from Kailua-Kona to Kawaihae was completed by the state in 1974. The Marriott, located directly behind Kuualii fishpond, opened in 1981, though it was the Sheraton at that time. In 1988 the Hyatt (now Hilton) hotel opened at the north end of the property. The present Waikoloa Beach Resort features are shown on Figure 1-3. The project site, Lot 11, is currently owned by Waikoloa Development Company. It is leased to the Waikoloa Beach Association (WBA), an organization comprised of the hotel owners and other resort elements, which are responsible for maintaining the pond and beach in a neat and attractive condition, and for maintaining/replacing common infrastructure on the property.

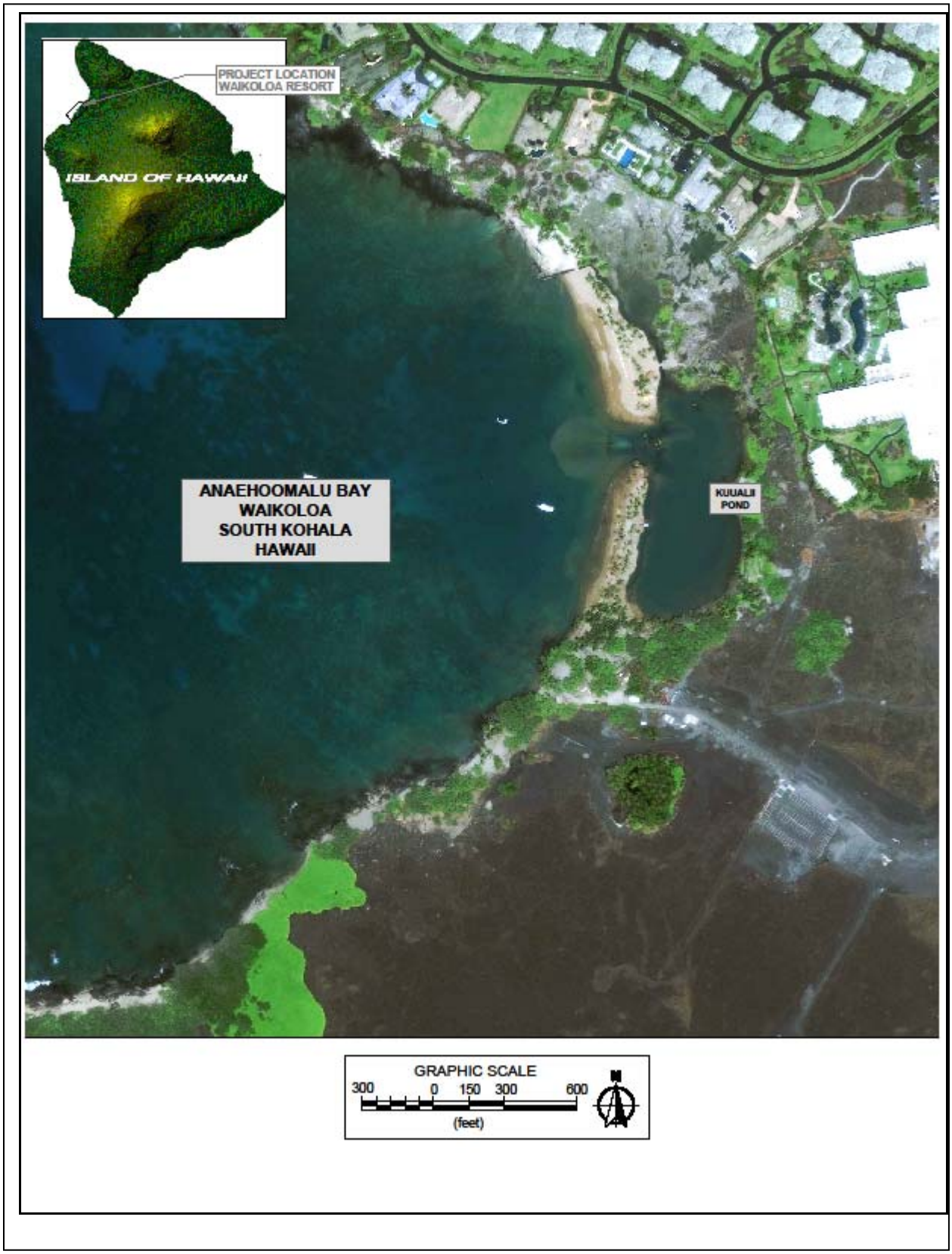

Figure 1-1 Project Location and Vicinity

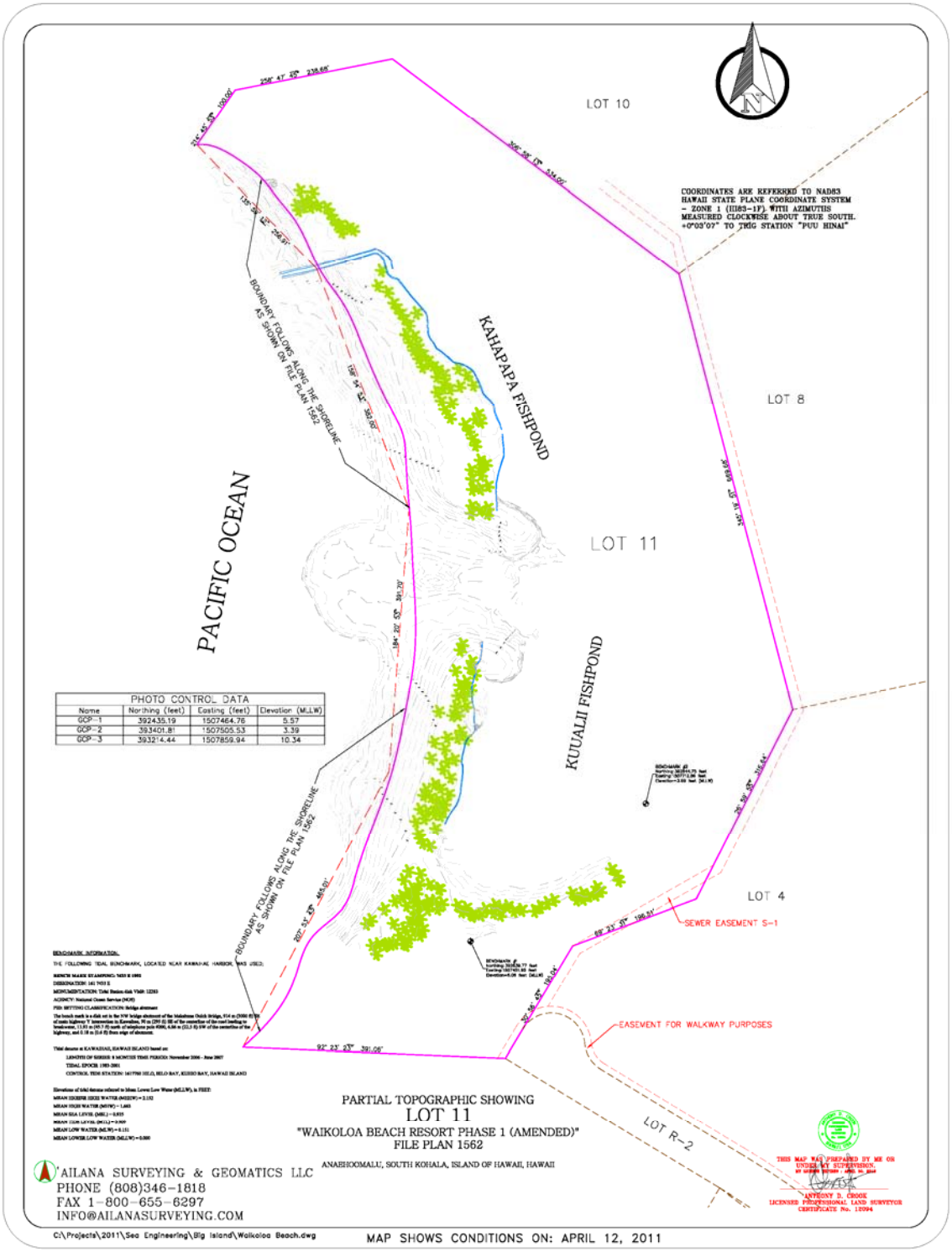

Figure 1-2 Project Site Property Boundaries

Figure 1-3 Waikoloa Beach Resort

Kuualii pond is approximately 4 acres in size, about 600 feet long north to south and 250 feet wide. The water depth is typically 3 feet to 4 feet. The pond bottom is composed of fine sediment, typically about 2 feet thick, over firm substrate. The pond and vicinity has been altered and modified over the years. At some point the beach was fortified by extensive planting of coconut trees, and a rock wall was constructed along the makai (ocean) side of the pond. The rock wall is reported to have been constructed in the 1980's during resort development. A 1972 Department of the Army (DA) permit issued by the USACE, Honolulu District (PODCO-O 981-D), authorized improvements to the beach and ponds at Anaehoomalu Bay, as did a State Conservation District Use Permit issued in 1972 (HA-5/5/72-315). The permitted work consisted of removing a rock ledge from the beach area, and clearing/dredging of the ponds and construction of a channel (auwai) through the beach to connect the ponds to the sea in order to improve pond circulation. This channel is the existing one connecting Kahapapa pond to the ocean. The connection between the two ponds was also improved. The DA permit included the condition "That the permittee will maintain the work authorized herein in good condition in accordance with the approved plans", and the CDUP stated that "Boise Cascade shall be responsible for the maintenance of the pond and beach areas." [Note: auwai is the Hawaiian term for a channel with water flowing in it, such as would connect a loko puuone pond to the ocean, and makaha is the term for a fence or gate in the auwai which controls fish entering or leaving the pond.]

Historically, there have been previous coastal natural hazards that have impacted the fishponds. Reportedly, they were damaged by tsunamis in 1946 and 1960, when Parker Ranch conducted repairs, and again damaged by Hurricane Iniki in 1992, when resort personnel conducted the repairs (Chuck Dewitt, unpublished).

1.2 Tsunami Damage and Emergency Beach Repair

On March 11, 2011, a tsunami generated by a massive earthquake in Japan struck the Hawaiian Islands. The tsunami resulted in significant damage to coastal areas, including major damage on the Kona (west) coast of the island of Hawaii. At Anaehoomalu Bay the tsunami severely eroded the beach fronting Kuualii pond, tearing a 100-foot wide gap through the beach and into the pond, extending 2 to 4 feet below water level, and destroying about 220 linear feet of the rock fishpond wall. The beach condition prior to and post tsunami is shown on Figure 1-4and Figure 1-5. Both figures were obtained from DigitalGlobe, Inc., and are geo-referenced and ortho-rectified satellite imagery, referenced to the Hawaii State Plane, NAD83 coordinate system. The breach can clearly be seen on Figure 1-5, and in a ground level photograph as shown on Figure 1-6. Sand was pushed into the pond on both sides of the gap, as well as carried offshore fronting the gap. Based on the estimated pre-tsunami beach configuration and a topographic survey immediately following the tsunami, roughly 3,000 cubic yards (cy) of sand was estimated to have been eroded in the gap's location, and approximately 9,000 cy was lost from the beach in total.

Figure 1-4 Satellite Image of Waikoloa Beach, 10 November, 2010

Figure 1-5 Satellite Image of Waikoloa Beach, 11 March, 2011

Figure 1-6 The Tsunami Breach at Waikoloa Beach, as Photographed 17 March, 2011

Figure 1-7 Temporary Repairs in the Tsunami Breach at Waikoloa Beach, as Photographed 20 September, 2011

The gap in the beach resulted in continuing sand infill into the pond by wave action. Various permits issued by the County, State and U.S. Army Corps of Engineers (USACE) during development of the resort require the maintenance and preservation of the pond, and thus a request for emergency repair of the beach was made by the WBA to the County Planning Department, the State Department of Land and Natural Resources (DLNR), and the USACE on March 28. After the final necessary approval was granted on July 7, repair work was initiated on July 25, and completed on August 3. The temporary emergency repair plan consisted of installing sand filled geotextile tubes to close the gap in the beach. The completed emergency repair work is shown on Figure 1-7. Plan and section views of the repair plan are shown on Figure 1-8. During the three month period required to obtain all the necessary approvals for the emergency repair work, wave action continued to enlarge the breach in the beach, scour sand from the remaining beach on both sides of the breach, and move sand into the fishpond. Consequently, when emergency repair work was finally able to start, the damage to the beach was considerably greater that it had been immediately after the tsunami. This resulted in the need for geotextile tubes with a total length of 240 feet to completely close the gap.

1.3 Purpose of This Study

The emergency repair work was accomplished as an intermediate step to protect the fishpond while a long-term, permanent repair/restoration plan for the pond and beach can be developed and the necessary permits and approvals obtained. Permanent repairs would include rebuilding the fishpond wall and restoration of the beach to its pre-tsunami condition, and removing sand in-fill from the pond. This study is intended to evaluate the repair and restoration needs, and develop a plan for this work. Only repair of tsunami related damage to the pond and beach is proposed at this time.

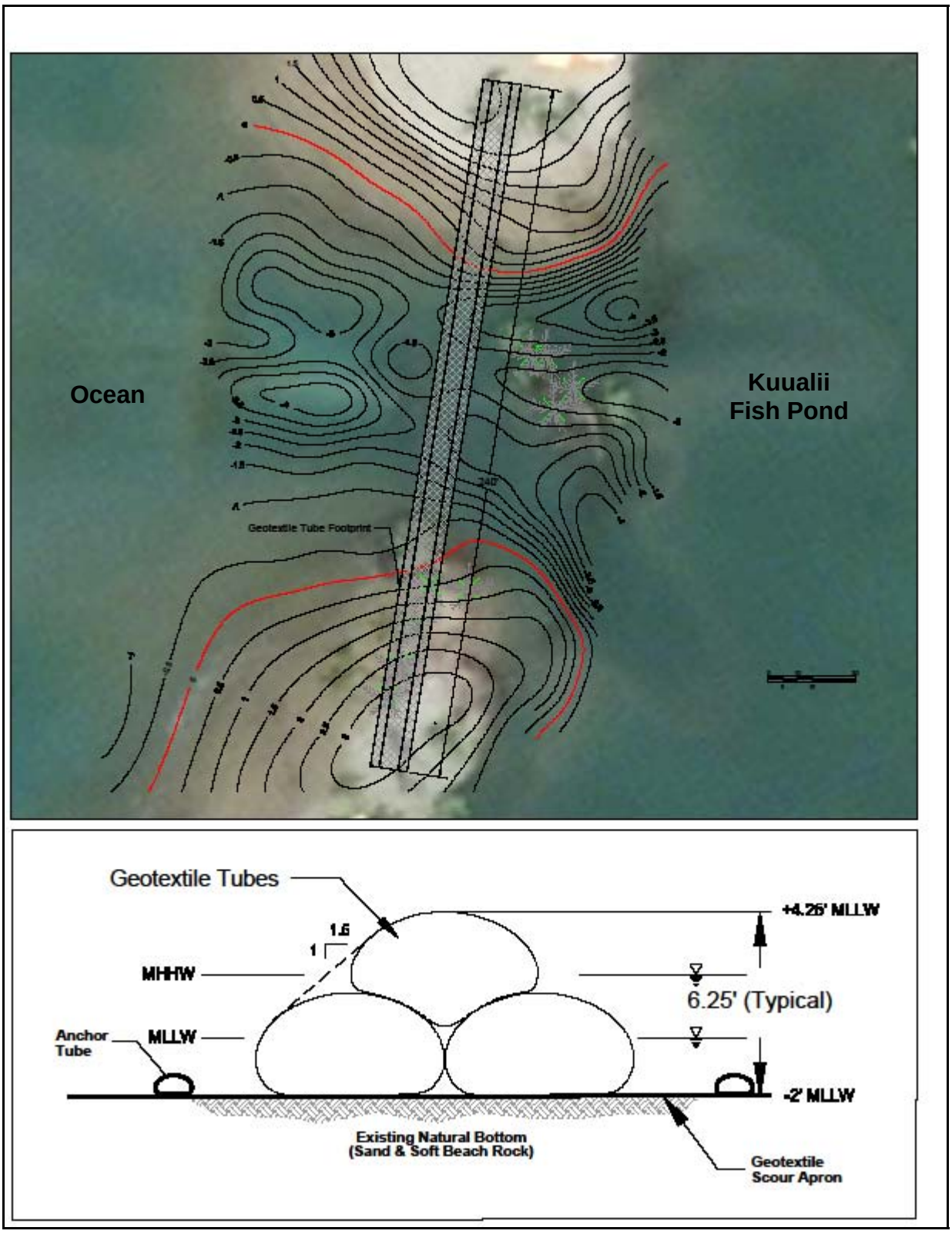

Figure 1-8 Plan View and Cross Section of Emergency Repairs

2. EXISTING CONDITIONS

2.1 Shoreline and Beach

As shown on Figure 1-5, the tsunami created a wide breach all the way through the beach and the rock fishpond wall. Sand was both pushed into the pond on both sides of the breach, and moved directly offshore to form a mound immediately seaward of the breach. A survey made on March 21, three weeks after the tsunami, showed the breach to be about 100 feet wide at the mean lower low water (mllw) elevation. A detailed site topographic survey on April 12, 2011showed the breach to be about 160 feet wide. The post-tsunami beach condition based on the April topographic survey is shown on Figure 2-1 During the three month period required to obtain all the necessary approvals for the emergency repair of the breach, wave action continued to enlarge the breach and scour sand from the remaining beach on both sides and move it into the pond. By the time the emergency repair was accomplished in the first week of August the breach was about 200 feet wide. The damage due to the immediate effects of the tsunami combined with the continuing damage during the permit phase of the emergency breach repair, resulted in the beach being significantly lower in elevation and narrower than it was pre-tsunami. The beach crest is presently about +3 feet mean lower low water (mllw). [Note: all elevations are referenced to the mllw datum.] The beach width above mean higher high water (mhhw) is presently about 50 to 70 feet along the southern half and 80 to 100 feet at the north end.

The pre-tsunami beach size and configuration has been estimated using the November 10, 2010 satellite image (Figure 1-4). Overlaying this on the post-tsunami topographic survey an estimated 9,000 cubic yards (cy) of sand was removed from the beach during creation of the breach and other tsunami damage. The majority of beach sand loss due to the tsunami occurred in the immediate vicinity of the breach; however sand loss lowered the beach crest elevation about 1-foot along virtually the entire length of the beach.

Emergency repairs used sand which had been pushed into the pond on either side of the breach to both fill the tubes and anchor them by creating a minor beach berm on their mauka side. Currently there are six (6) 120 foot long by 15 foot circumference sand filled tubes placed across the breach section to form a 240-foot-long barrier, stacked in a two tubes on the bottom and one on top configuration. Mauka of the tubes is an approximately 25 foot wide sand berm separating them from Kuualii fishpond. The post-emergency repair beach configuration is shown on Figure 2-2.

Following the emergency repair work the beach immediately began to repair itself, with sand accreting on and in front of the geotube barrier. Figure 2-3 and Figure 2-4 show the shoreline fronting the geotubes immediately post-construction (August 4, 2011), and seven months later on March 14, 2012. The bottom tubes are completely buried and only a portion of the top tube is visible, and a natural beach slope extends seaward of the tubes. A topographic survey update on February 25, 2012 shows that approximately 3,400 cy yards of the sand lost during the tsunami has returned to the beach, leaving a current net loss of 5,600 cy from pre-tsunami conditions. The February 25, 2012 survey is shown on Figure 2-5. The nearshore sand mound seaward of where the breach was located has diminished in volume, presumably some of this sand has been moved back on to the beach by wave action.

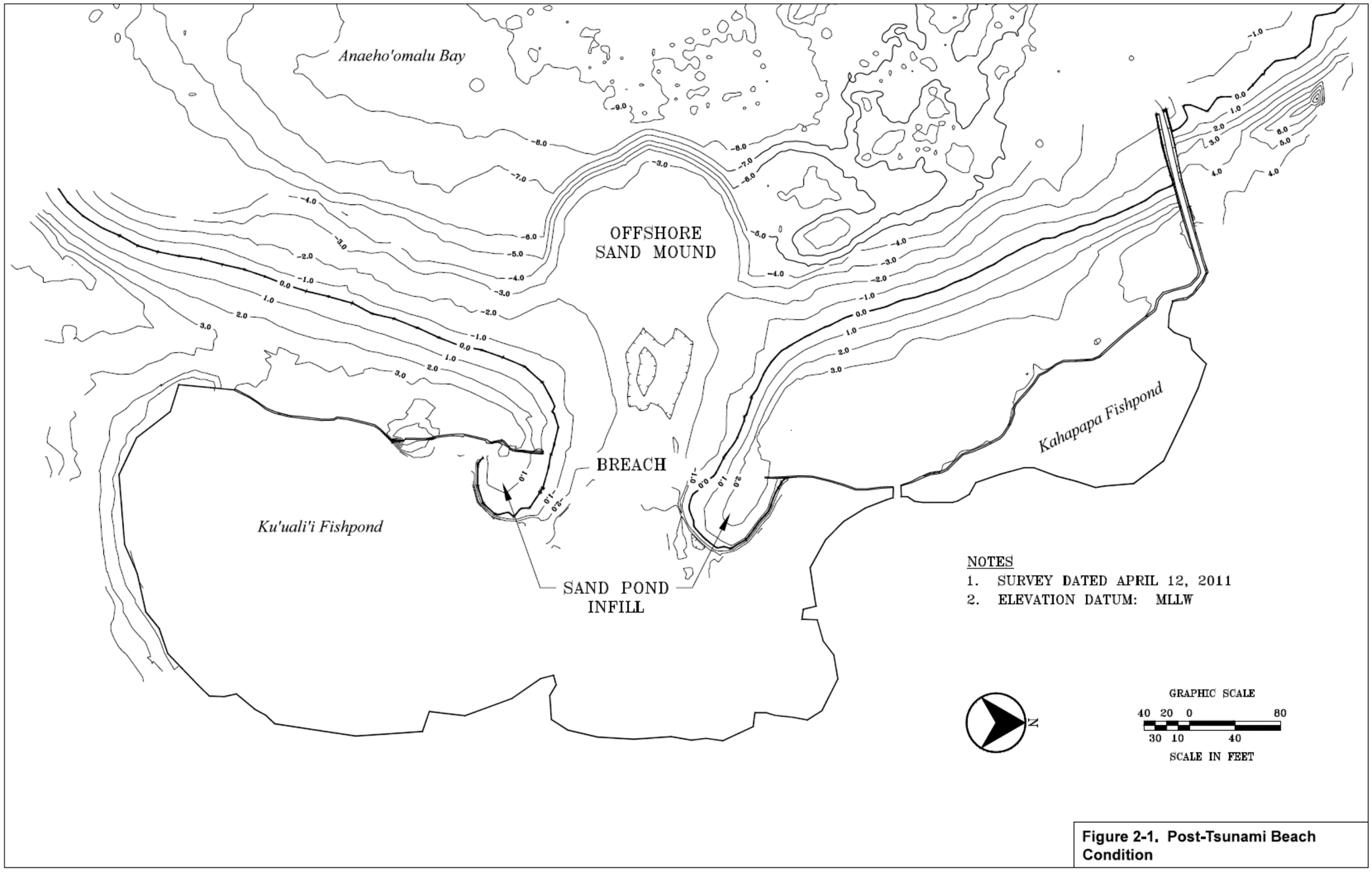

Figure 2-1 Post Tsunami Beach Condition

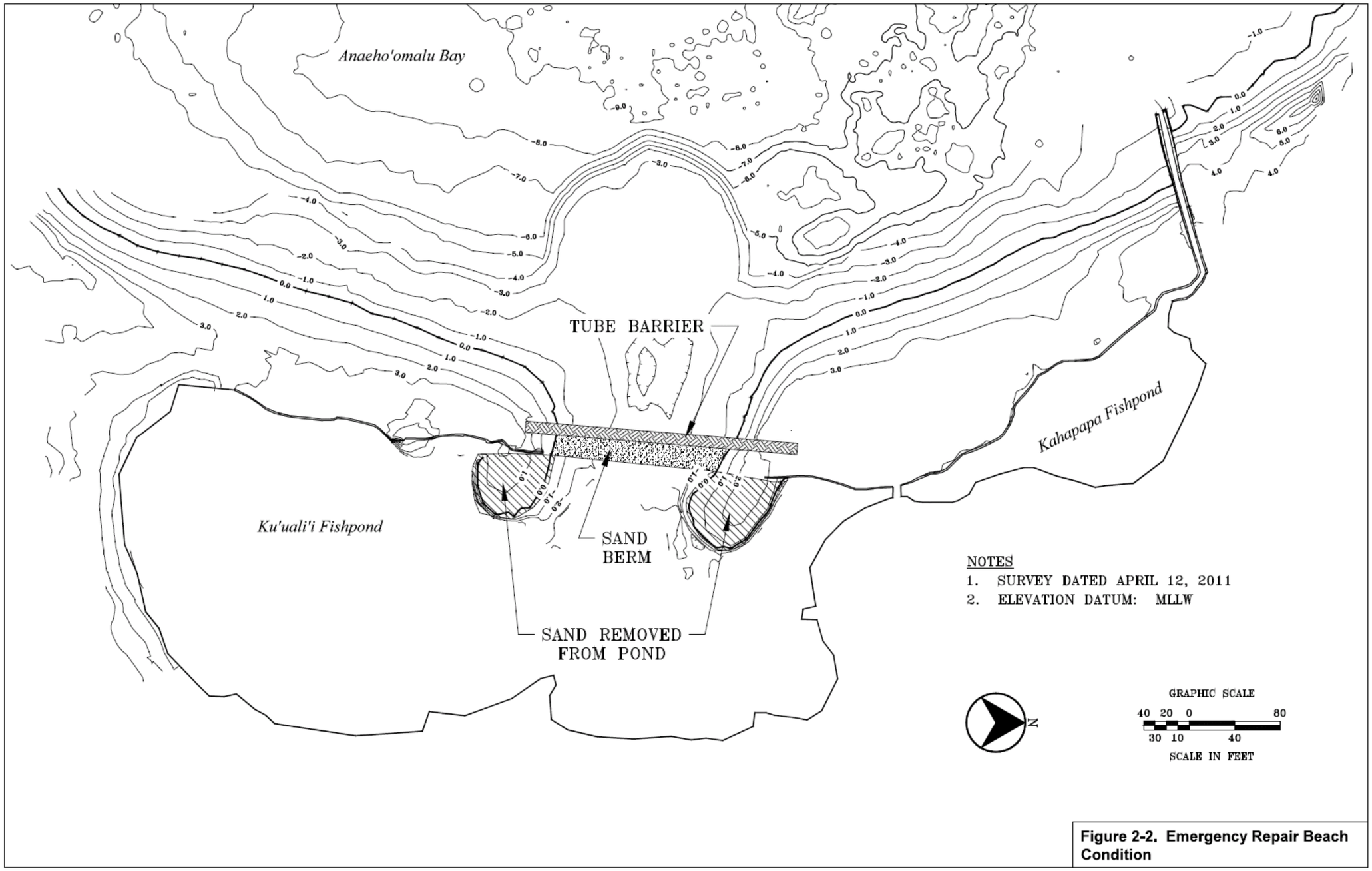

Figure 2-2 Emergency Repair Beach Condition

Figure 2-3 Post Emergency Repair, August 4, 2011

Figure 2-4 March 14, 2012 Shoreline

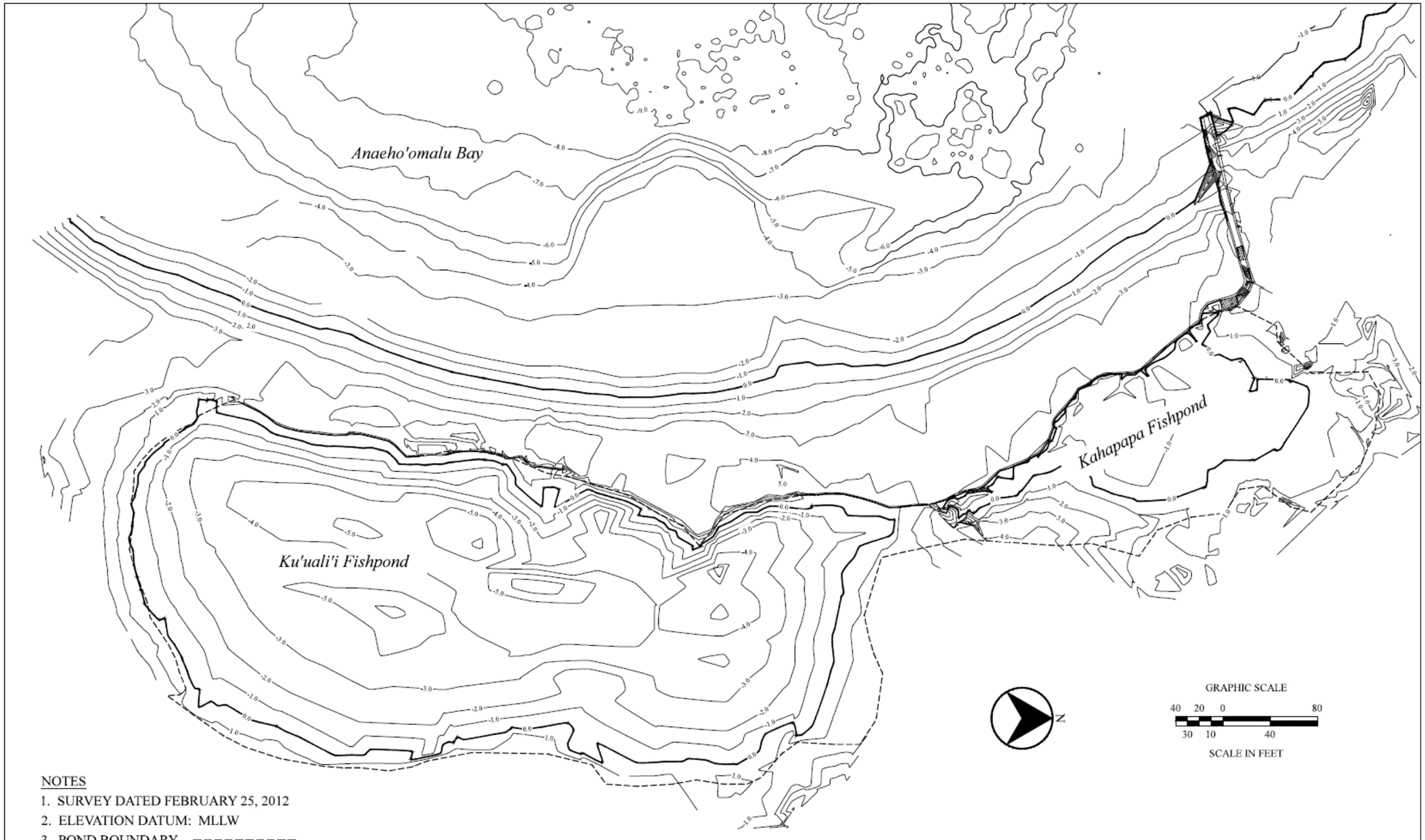

Figure 2-5 Shoreline Condition on February 25, 2012

The emergency repairs removed much of the sand in-fill from the pond in the vicinity of the breach to fill the geotubes, however an estimated 800 cy of sand remains to be removed and could be placed on the beach.

The sand on the beach is a mixture of calcium carbonate (e.g. marine origin shell and reefal fragments) and basalt lava. The sand is relatively coarse, with a median grain size of 0.5 mm. Bottom sediments seaward of the beach toe, in about four feet of water, are typically very fine sand, with a median size less than 0.1 mm. The sand comprising the mound seaward of the beach breach is identical to the sand on the beach, indicating that the mound was created by tsunami eroded beach sand.

2.2 Pond and Nearshore Marine Environment

Waikoloa has one of the most comprehensive environmental monitoring programs on the West Hawaii coast, beginning in 1977 and continuing today. The monitoring focus is primarily on the anchialine ponds located on the north side of Waikoloa Resort, however there are water quality sampling stations in Kahapapa and Kuualii ponds also, as well as nearshore marine sampling stations. Dr. Richard Brock (Environmental Assessment Company) has conducted a quarterly water quality monitoring program for the resort since 1991, reporting on samples from 18 to 24 permanent sampling stations (Brock, 2011). These stations sample a broad cross section of water; from wells inland of the resort, through anchialine ponds, the fishponds, and nearshore coastal waters. The program focuses on measuring water quality parameters identified by the State Department of Health (HAR, Chapter 11-54). There is significant groundwater flow under the resort, and this groundwater is typically nutrient rich, although the nutrient chemistry of West Hawaii groundwater is highly variable both spatially and temporally and concentrations are frequently in excess of biological needs (Brock, 2011). Beginning in 2006 the resort began significantly reducing the application of fertilizers, with the result that nitrogen and phosphorus concentrations in the groundwater, and thus the input of these to the ponds and nearshore waters, has declined. In 2008 the use of treated sewage effluent in the resort's irrigation system was discontinued pending upgrades in treatment to meet Department of Health standards for treated effluent reuse in irrigation water, and this has further contributed to a decrease in nutrient levels. The concentrations of water quality parameters tested typically do not meet the State water quality standards, however they are not particularly high when compared to other undeveloped areas along the West Hawaii coast (Brock, 2011). It is well known that near shore waters on the West Hawaii coast frequently do not meet the standards for nitrate, nitrogen, ammonia nitrogen, total nitrogen and chlorophyll-*a*. The groundwater discharge along the shore also results in slightly lowered nearshore salinity levels. Turbidity also typically exceeds the State standard, and with the standard for West Hawaii of 0.10 NTU most near shore West Hawaii waters are not in compliance (Brock, 2011). West Hawaii coastal waters and Anaehoomalu Bay are designated Class AA (HAR 11-54). "It is the objective of class AA waters that these waters remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions" (HAR 11-54).

The Environmental Assessment Co. conducted investigations and made recommendations for improving water clarity in Kuualii and Kahapapa fishponds (Brock, 1991). The ponds fell into disuse in the late 1800's and have not been managed as an aquaculture facility since that time. Presently water exchange in the ponds is low and organic production is high resulting in poor water clarity. The primary sources of water for the ponds are low salinity groundwater, and seawater entering through the Kahapapa connection to the ocean and percolating through the sand beach fronting the pond. The groundwater entering the ponds is high in inorganic nutrients which fuel the growth of algae and phytoplankton, and population densities are much higher than in nearby normal coastal settings, which is the major contributor to the turbid conditions. Brock estimated the residence time of water in Kuualii pond to be 15 to 27 days, far in excess of the growth rate of phytoplankton. One recommendation for improving water clarity was to construct a second auwai, or circulation channel, at the southwest corner of the pond to improve circulation and flushing. Brock contends that such a channel may have existed in prehistoric times, however he acknowledges that no quantitative evidence of this presently exists. The

present channel connecting the two ponds, and the channel connecting Kahapapa pond to the ocean are modern in origin. No additional circulation channels are proposed for the permanent tsunami repair plan.

Planning is underway by the Waikoloa Land and Cattle Company for a new resort residential project to be developed immediately south of the beach and Kuualii fishpond. In support of this project a baseline marine environmental assessment was conducted in 2006 and 2008 by Marine Research Consultants, Inc. (MRC, 2008). The work included water quality sampling and analysis, and assessment of the benthic and fish marine community. Dissolved inorganic and total nutrients showed strong gradients with distance from shore, with the highest values at the shoreline and lowest values furthest from shore. The gradient was very steep to a distance of 50 m from shore, and then flattened out. Salinity concentrations were just the opposite, lowest at the shoreline and increasing with distance seaward. These patterns are indicative of groundwater flow along the shoreline. The central portion of the bay floor, fronting Kualii pond, is a sand bottom channel. On either side of the channel the bottom consists of hard basalt and limestone substrate covered with reef building corals. The inner portion of the bay is somewhat sheltered from waves, and the coral community structure consists of lobate and branching species of the genera *Porites*. The average coral cover was about 85% of the bottom area, with about half of this being *Porites lobata*. The delicate branching species *Porites compressa* covered about 21% of the bottom, and it showed no indication of breakage or damage by wave action. Besides corals, sea urchins are the other dominant group of macroinvertebrates observed on the reef, the most common being *Echinometra matheai*. Other benthic organisms observed were sea cucumbers (Holothurians), starfish (Asteroidea), and encrusting red calcareous algae. The reef fish community is typical of that found along most of the Kona coast. During the surveys 34 fish species were observed, with herbivores (yellow tang, goldring surgeonfish, and brown surgeonfish) being the most common. Other abundant fishes included wrasses. Observed species of "food fish" (those taken by subsistence and recreational fisherman) included grand-eyed porgeys, squirrelfish, parrotfish, goatfish, and grouper. None of the food fish species were particularly abundant.

3. PROPOSED PERMANENT TSUNAMI DAMAGE REPAIR PLAN

Fishpond health for a sand dune pond (loko puuone) is closely tied to the health and location of the adjacent beach system. The beach acts as a natural hazard buffer for the pond by providing a barrier to dissipate incident wave energy and prevent waves from carrying sand and sediment into the pond. Ideally the beach system should be high enough or wide enough to prevent wave overtopping and the resulting carrying of sand into the pond. Prior tsunami (1946 and 1960) and hurricane (Iniki, 1992) events have reportedly resulted in damage to the beach and pond and required repairs to maintain the pond. The existing pond wall was built in the 1980's as a response to winter wave events that were migrating the beach landward into the pond. This wall has been effective at slowing the landward migration of the beach, but has not been sufficient to stop wave overtopping of the beach and washing of sand into the pond. In the past, the resort pushed sand on the beach face up to create a berm at the beach crest to reduce the extent of wave overtopping. However, in 2010 they were ordered by the Army Corps of Engineers to desist from this practice unless a Department of the Army permit for work in waters of the U.S. is obtained. Normally, a healthy frontal dune would provide a natural barrier and protection for a loko puuone pond. However, in its present damaged and degraded condition the beach is not capable of providing an effective barrier for maintenance of the pond. In addition, with potential sea level rise, the beach's natural response will be to elevate and migrate landward. The most important aspect of pond restoration will be to reestablish the wall to provide a fixed barrier to prevent landward beach migration. However, the wall itself is not designed to be stable under direct wave attack, and maintenance of the beach is necessary to protect the wall from wave damage. The wall and beach act together to provide the necessary protection for the pond, the wall provides a fixed barrier for the beach to abut and to stop its landward migration, and the beach provides for wave energy dissipation to protect the wall. Restoration of both the wall and beach is necessary for maintenance and long-term stewardship of the pond resource.

3.1 Wall Repair

The existing pond wall is shown on Figure 3-1. It is not known exactly how the existing wall was constructed. Anecdotal information indicates that large boulders were placed first to form a stable mass, then the cemented stacked rock wall was constructed on top of the boulders. Evidence of this construction technique can be seen at some of the damaged wall locations. Approximately 220 linear feet of wall was completely destroyed by the tsunami, and other sections are now leaning and appear unstable. Given the extensive damage it is recommended that the entire wall be replaced. It is proposed to rebuild the wall in a manner similar to its original construction. The remains of the existing wall will be removed, and sand excavated from around it to expose the boulder foundation. Where boulders are not found, or have settled to a position below the low tide water level, additional boulders will be placed as necessary to create a stable mass. The top of this mass boulder foundation will be at approximately mean lower low water. A cemented stone wall (cement-rubble-masonry or CRM) will then be built on top of the boulder foundation, with a top elevation of +6 feet. A typical wall section is shown on Figure 3-2. The wall would be of standard gravity wall design, and the first course of wall stone would be carefully placed to key it into the boulder foundation. The total wall length would be approximately 690 linear feet.

Figure 3-1 Existing Pond Wall

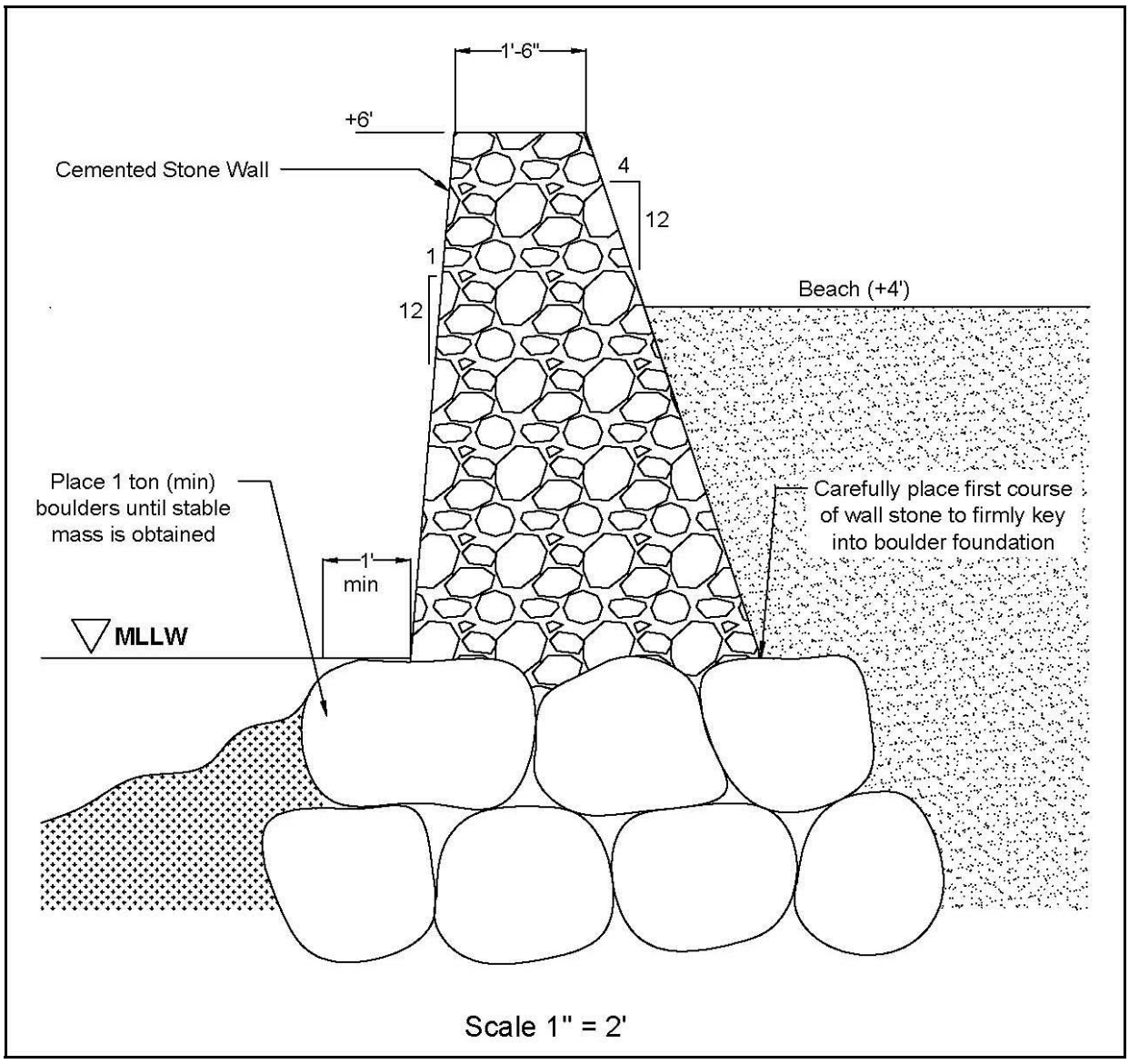

Figure 3-2 Wall Repair Section

3.2 Beach Restoration

The pre-tsunami beach configuration can be estimated using the November 10, 2010 aerial imagery (Figure 1-4) and LIDAR topographic data for the site. Based on a post-tsunami survey approximately 9,000 cy of sand was removed from the beach during the tsunami, creating what became a 200-foot-wide breach into the pond and reducing much of the beach crest elevation by about a foot. Much of this sand was deposited in the pond, and some was moved offshore immediately seaward of the breach. Instability of the beach due to tsunami damage led to continued changes in the beach configuration and loss of sand into the pond during the interim while waiting for emergency repair approval to close the breach and prevent further damage to the beach and pond. Following completion of emergency repairs the beach began to repair itself, with sand accreting over and seaward of the geotubes, burying the tubes and creating a natural beach slope seaward of them. A February 2012 topographic survey shows that about 3,400 cy of sand has accreted, leaving approximately 5,600 cy still missing from the pre-tsunami beach configuration.

It is proposed to recover sand remaining in the pond (800 cy) and place it on the beach crest to help restore the pre-tsunami beach elevation. All recovered sand would be placed above the mean higher high water (mhhw) elevation (+2.1 feet). Assuming its availability from a commercial on-land source, up to 4,800 cy of beach quality sand will also be placed on the beach crest above the +2.1 foot mhhw elevation to nourish the beach and help improve its long term stability. Raising the beach crest will also reduce the potential for high waves to overtop the beach and push sand into the fish pond. No sand will be placed below the +2.1 foot elevation or in the water.

A beach restoration plan view is shown on Figure 3-3. The emergency repair approvals received from the Department of the Army, State DLNR and the County of Hawaii Planning Department, all require that the geotextile tubes used for emergency repairs be removed during implementation of a permanent repair plan and their sand fill be returned to the littoral system. However, given the extensive accretion of sand following the emergency repair, which has buried the tubes, their removal would be very detrimental to the natural beach repair processes which have occurred. Geotube removal would require extensive excavation of the beach to uncover them, which could destabilize the beach and result in additional beach damage. It is thus proposed that the geotubes be left in place. Should, at some future time, they become sufficiently exposed to permit their removal without damage to the beach or natural littoral processes, consideration would be given to removing them.

3.3 Repair Plan

The beach repair plan as shown on Figure 3-3would consist of the replacement of approximately 690 linear feet of pond wall, recovery of sand remaining in the pond and the nearshore sand mound, and placement of up to 5,600 cy of sand on the beach crest above the MHHW (+2.1 feet) elevation. Reconstruction of the wall will require up to 580 cy of stone and approximately 190 cy of CRM to be placed below the mean higher high water elevation of +2.1 feet.

Figure 3-3 Repair Plan

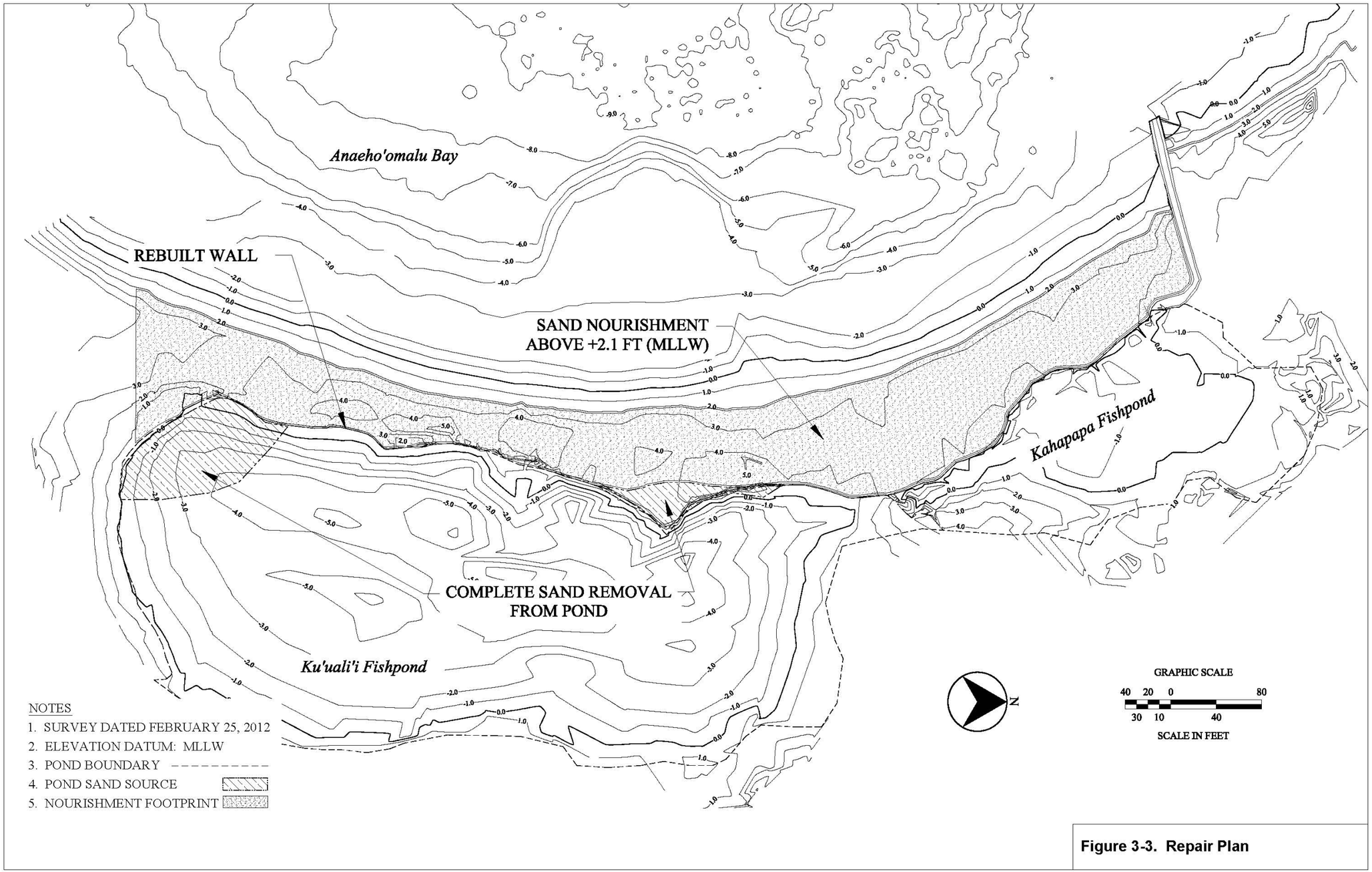

Figure 3-3. Repair Plan

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Best Management Practices Plan

Anaehoomalu Bay Tsunami Damage Repair
Waikoloa, South Kohala, Hawaii

Prepared by

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November 2012

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I. Purpose

The purpose of this Best Management Practices Plan (BMPP) is to ensure that adequate protective measures are in place during repair of tsunami damage to the Kuualii Fishpond and Anaehoomalu Beach, Waikoloa, Island of Hawaii. This plan is designed to prevent, if possible, or minimize adverse impacts to coastal water quality and the marine ecosystem. The project specifications will require the Construction Contractor to adhere to environmental protection measures, including, but not limited to, those included in this plan.

II. Best Management Practices Plan

1. All permits and clearances shall be obtained prior to the start of any construction activities. The Contractor and his sub-contractors shall ensure that all construction work complies with all permit conditions and commitments made with environmental agencies.

2. The Contractor shall perform the work in a manner that minimizes environmental pollution and damage as a result of construction operations. The environmental resources within the project boundaries and those affected outside the limits of permanent work shall be protected during the entire duration of the construction period.

3. The construction Contractor shall be required to comply with all the BMPP requirements including daily inspection of equipment for conditions that could cause spills or leaks; cleaning of equipment prior to operation near the water; proper location of storage, refueling, and servicing sites; and implementation of adequate spill response procedures, stormy weather preparation plans, and the use of full depth silt curtains and other containment devices.

4. The Contractor shall confine all construction activities to areas defined by the drawings and specifications. No construction materials shall be stockpiled in the marine environment outside of the immediate area of construction.

5. Construction work shall be conducted between the hours of 7:00 am to 6:00 pm.

6. No construction equipment shall be parked within any road right-of-way in such a manner that the equipment will obstruct the normal movement and sight distance of driving motorist, except during actual working hours.

7. The Contractor, for the duration of the contract, shall maintain all excavations, embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, and all other work areas within or without the project limits

free from dust which would cause a hazard to the work or the operations of the other contractors, or to person or property.

8. The project shall be completed in accordance with all applicable State and County health and safety regulations.

9. No project related materials other than those specifically related to the damage repair project shall be stockpiled in the water.

10. Public safety best practices shall be implemented, possibly including posted signs, areas cordoned off, and on-site safety personnel.

11. Public access along the shoreline during construction shall be maintained so far as practicable and within the limitations necessary to ensure safety.

12. When construction operations are completed, the Contractor shall restore the area to its original state.

13. Should any unanticipated archaeological site(s), such as walls, platforms, pavements and mounds, or remains such as artifacts, burials, concentrations of charcoal or shells be uncovered by the work activity, all work shall cease in the immediate area and the Contractor shall notify the Hawaii Island State Historic Preservation Office at 808.692.8015. No work shall resume until the owner/contractor obtains clearance from the Historic Preservation Office.

III. Noise

- Best management practices shall be utilized to minimize adverse effects to air quality and noise levels, including the use of emission control devices and noise attenuating devices.

- Noise shall be kept within acceptable levels at all times in conformance with HAR Title 11 § 46 Community Noise Control, State Department of Health, Public Health Regulations.

- The Contractor shall obtain and pay for a Community Noise Permit from the State Department of Health when the construction equipment or other devices emit noise at levels exceeding the allowable limits.

- All internal combustion engine-powered equipment shall be equipped with mufflers to minimize noise and shall be kept properly maintained to reduce noise to acceptable levels.

- Starting up construction equipment meeting allowable noise limits shall not be done prior to 7:00 am without prior approval of the Waikoloa Resort. Equipment exceeding allowable noise levels shall not be started up prior to 7:30 am.

IV. Dust

- The Contractor, at his own expense, shall keep the project and surrounding areas free from dust nuisances. The work shall be in conformance with the Air Pollution Control Rules of the State Department of Health, HAR Title 11 § 60.1 Fugitive Dust.

- A dust control program shall be implemented and windblown sand and dust shall be prevented from blowing offsite by watering when necessary.

V. Oil and Spill Containment

- The Contractor shall ensure that an Oil Spill Response Plan is in place which shall detail procedures for managing the accidental release of petroleum products to the aquatic environment during construction. Fueling of project related vehicles and equipment should take place away from the water. Absorbent pads, containment booms and skimmers will be stored on site to facilitate the cleanup of petroleum spills.

- Any spills or other contaminations shall be immediately reported to the DOH Clean Water Branch (808-586-4309).

VI. Monitoring/Measures for Visually Detected Containment

- All work operations shall be performed in conformance with the applicable provisions of the Hawaii Administrative Rules (HAR), Title 11 § 55 Water Pollution Control and Title 11 § 54 Water Quality Standards, and to the Erosion and Sedimentation Control Standards and Guidelines of the Department of Public Works, County of Hawaii.

- The Contractor shall keep construction activities under surveillance, management and control to avoid pollution of surface or marine waters. Daily visual inspection of the construction site and its environs will be conducted by a designated individual, or his representative, to verify that the permitted activities do not result in uncontrolled adverse environmental impacts. Visual inspections will be documented with photographs and written descriptions, if necessary.
    a. Daily Inspection: The project site will be inspected daily to ensure BMPP's are maintained to confine and isolate potential pollutants from being discharged into surrounding areas. The site will be inspected to ensure:
        i. All silt fences are functioning properly; and
        ii. Materials are properly stored, rubbish is being collected and disposed of properly, etc.
    b. Deficiencies identified by daily inspections shall be corrected immediately. Work activities will stop and remain stopped until the deficiencies have been corrected.

- Erosion control measures shall be in place before any work is started. Erosion control measure shall include silt fencing and turbidity containment devices around active work areas.

- The Contractor shall maintain and clear blockage and debris from the erosion control measures as necessary everyday and after heavy rain events.

- Construction related turbidity at the project site shall be controlled so as to meet water quality standards. All water areas affected by construction activities shall be monitored by the Contractor. If monitoring indicates that the turbidity standards are being exceeded due to construction activities, the Contractor shall suspend the operations causing excessive turbidity levels until the condition is corrected. Effective turbidity containment devices shall be deployed where practicable to isolate the construction activity, and to avoid degradation of marine water quality and impacts to the marine ecosystem.

- All construction material including sand shall be free of contaminants of any kind including: excessive silt, sludge, anoxic or decaying organic matter, turbidity, temperature or abnormal water chemistry, clay, dirt, organic material, oil, floating debris, grease or foam or any other pollutant that would produce an undesirable condition to the beach or water quality.

- No contamination of the marine environment shall result from the permitted activities. Particular care must be taken to ensure that no petroleum products, trash or other debris enter near-shore and open ocean waters. When such material is found within the project area, the Contractor, or his designated construction agent, shall collect and dispose of this material at an approved upland disposal site.

- Waste materials and waste waters directly derived from construction activities shall not be allowed to leak, leach or otherwise enter marine waters.

- The Contractor shall construct temporary berms, dikes, dams, sediment basins and silt fences, and use temporary mulches, mats and gravel blankets as necessary to control erosion.

VII. Endangered Species Act Compliance

- The project manager shall designate a competent observer to survey the marine areas adjacent to the proposed action for ESA-listed marine species. A safety zone shall be established extending 150 feet beyond the limits of the active work area that will be visually monitored for protected marine species.

- Visual surveys for ESA-listed marine species shall be made 30 minutes prior to, at 30 minute intervals during, and 30 minutes after any project activity, and prior to resumption of work following any break of more than one half hour.

- All in-water work shall be postponed or halted When ESA-listed marine species are within 150 feet of the active work area, and shall only begin/resume after the animals have voluntarily departed the area (which may be considered to have occurred 30 minutes following the last sighting). If ESA-listed marine species are noticed after work has already begun, that work may continue only if there is no way for the activity to adversely affect the animal(s). For example, divers performing surveys or underwater work (excluding the use of toxic chemicals) is likely safe. The use of heavy machinery is not safe until the creature has departed the area.

- Any construction related debris that may pose an entanglement hazard to marine protected species must be removed from the project site if not actively being used and/or at the conclusion of the construction work.

- Do not attempt to feed, touch, ride, or otherwise intentionally interact with any ESA-listed marine species.

- All on-site project personnel must be apprised of the status of any ESA-listed species potentially present in the project area and the protections afforded to those species under federal laws. A brochure explaining the laws and guidelines for ESA-listed species in Hawaii, American Samoa, and Guam may be downloaded from: http:www.nmfs.noaa.gov/prot_res/MMWatch/Hawaii.htm

- The Contractor shall keep a record of all turtle sightings, incidents of disturbance, or injury.

- The Contractor shall immediately report any incidental take of marine mammals must be reported immediately to NOAA Fisheries' 24-hour hotline at 1-888-256-9840. In Hawaii, any injuries incidents of disturbance or injury to sea turtles must be immediately reported, and must include the name and phone number of a point of contact, location of the incident, and nature of the take and/or injury. If the incident involves an ESA-listed marine species, it should be immediately reported to NMFS, the Corps of Engineers, and the Pacific Island Protected Species Program Manager, Southwest Region (Tel: 808-973-2987, fax: 808-973-2941).

VIII. Materials and Waste

- The Contractor shall not dispose any concrete, steel, wood, and any other debris into marine waters. Any debris that falls into the marine water shall be removed at the Contractor's own expense.

- No contamination (trash or debris disposal, alien species introductions, etc.) of the marine environment adjacent to the project site shall result from project related activities.

- The Contractor shall remove all floating or submerged construction materials and/or debris at the end of each day.

- The Contractor is responsible for the proper handling, storage and/or disposal of the all waste generated by this construction.

IX. Operational Controls

a. This plan will be reviewed with the project field staff prior to the start of work.
b. All activities significantly impacting the environment will not begin until appropriate BMPP's are properly installed.
c. Construction will be immediately stopped, reduced or modified; and/or new or revised BMPP's will be immediately implemented as needed to stop or prevent polluted discharges to receiving waters.

X. Structure, Authority, and Responsibility

The Project Manager/Superintendent/Project Engineer will ensure compliance with this plan.

The Project Manager/Superintendent/Project Engineer will appoint and train one (1) additional individual to properly install all BMPP's and to comply with all aspects of this plan.

XI. Training

a. Employees will be instructed in proper installation of the BMPP materials.
b. BMPP's will be covered in the weekly toolbox safety meeting.
c. BMPP's will be discussed, as applicable, for each new phase of work.

XII. Inspection and Monitoring

a. The Project Manager/Superintendent/Project Engineer or the assigned trained individual will conduct a visual inspection of all BMPP's daily.
b. All minor repairs and maintenance of the BMPP's will be completed within 24 hours of detection. Major repairs of BMPP's shall be completed as soon as practical but in no case later than seven (7) days after inspection.
c. If any BMPP is damaged, work will immediately be stopped and shall not resume until repairs to the BMPP have been completed.

XIII. Record Keeping/Documentation

a. A copy of this plan will be kept on site.
b. All BMP inspection reports will be kept on site.
c. Records of inspection and repair of control measures will be retained in the project files for a minimum of five years.

XIV. Site-Specific Management Practices

a. Material Management
    i. Only a minimum quantity of materials necessary for the work will be stored on site.
    ii. All flammable and reactive liquids will be kept in sealed and clearly labeled original or compatible containers and stored under cover more than fifty (50) feet from the edge of the property and away from the nearest drain and receiving waters.
    iii. Repair materials will be stored in storage containers or covered with polyethylene sheeting to avoid contact with storm waters.
    iv. Storage area will be kept clean and well organized.
    v. Stored materials will be inspected weekly. The contents of any damaged or rusted containers will be transferred into a suitable container or in secondary containment.
    vi. Materials will be used in strict accordance with the manufacturer's instructions.

b. Waste Management
    i. All repair debris will be collected and placed daily in the container located in the Contractor's staging area.
    ii. The Contractor will arrange for pick up and disposal of filled container as necessary.
    iii. Portable toilets will not be placed near the shoreline.
    iv. Portable toilets will be cleaned weekly or more frequently as necessary.
    v. Cleanup of waste will be conducted through sweeping, shoveling, or vacuuming operations only.

c. Hazardous Waste Management

Note: No hazardous wastes are anticipated for this project. The following will apply should hazardous waste be encountered:

    i. Non-hazardous or less hazardous materials should be used whenever possible.
    ii. Hazardous waste shall be placed in secondary containment.
    iii. Hazardous waste shall not be mixed with other waste and repair debris placed in the dumpster.

iv. Flammable or reactive waste will be placed in a separate area more than 50 feet from the edge of the property, nearest drain inlet and the shoreline.

d. Vehicle and Equipment Management
   i. Fueling operations will be monitored to prevent spills, leaks and overflows. Equipment will be fueled away from any drain or edge of the harbor. A spill pan will be used to catch spill/leaks. Equipment will not be “topped off.” Spill cleanup materials will be readily accessible.
   ii. Vehicles and construction equipment (except small tools, generators, welders, etc.) shall be maintained off-site. If emergency repairs or maintenance on large equipment (i.e. crane) must be performed, drip pans or drop cloth will be placed under the vehicle or equipment to catch any spills/leaks.

e. Erosion and Sediment Control Measures
   i. Removed materials will be placed in a storage bin or stockpiled in a berm; the stockpiled materials shall be disposed of at the earliest date.
   ii. Care shall be exercised in the removal and transporting of debris and rubbish for disposal.
   iii. Any spillage on pavement and concrete surfaces will be cleaned up immediately.
   iv. Loads will be covered when transported.